# ABET SELF-STUDY REPORT



for Computer Engineering

July 1, 2012



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### **BACKGROUND INFORMATION**

Note to the ABET Evaluator: this document contains many hyperlinks to the support documentation provided. Reading the electronic version is suggested.

#### A. Contact Information

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For the ECE Department, please contact

Dr. John Harris, Chair Department of Electrical and Computer Engineering 216 Larsen University of Florida Gainesville, FL 32611 352-392-0911 harris@cnel.ufl.edu You may also contact the ECE Associate Chair, Dr. Rob Fox, 352-392-2543, <u>fox@tec.ufl.edu</u>), the Undergraduate Coordinator, Dr. Henry Zmuda (352-392-0990, <u>zmuda@ece.ufl.edu</u>), or ECE Student Services (352-392-9758).

#### **B.** Program History

The University of Florida has a long tradition of producing excellent students in Computer Engineering. The Computer Engineering (CE) program was created in 1992, but our connection to information technology dates back to the very beginning of digital computers. John V. Atanasoff received his B.S. in 1925 from the University of Florida and went on eventually to build the world's first digital computer. We are equally proud of our graduates and students of today. Graduates of the UF Computer Engineering program have a superior placement record and are in great demand from some of the leading technology companies in the field, including Microsoft, Intel, Harris, Raytheon, Lockheed-Martin, Northup-Grumman, Amazon, Oracle, and IBM. Like many computer programs around the country the enrollment dipped significantly since 2000, but appears to have stabilized a few years ago to about nearly 500 undegraduates (in addition to about 190 graduate students).

Our ACM programming contest teams have improved their performance over the past few years. In 2007, one of the four student programming teams we fielded at the ACM Southeast Regional programming competition won first place, for the first time in our history, competing against 75 other teams from 31 universities. Another team won second place in 2008, and in 2010 our team qualified for the IEEExtreme world competition, and won 14<sup>th</sup> place in the world, and first place in the Americas, competing against nearly 1000 teams from 350 universities from around the world. In November 2011, UF again competed in the IEEXtreme 5.0, a 24 hour marathon programming contest. Out of more than 1500 teams world wide and 227 teams from the USA, our best team--starring Joe Thuemler, Jason Fisher, and Cheran Wu—finished 1st in North America (thus 1st in the USA and region R03) and 13th in the world. [Student Programming Teams]

The program offers two tracks, hardware and software, allowing students to opt for a more software or hardware oriented curricula depending upon their interests. The program consists of a common core of courses designed to give students a solid foundation in the skills needed to excel in Computer Engineering. In addition, both tracks emphasize a thorough understanding of hardware, software, and their interactions in a complete computer system. Our alumni are known for their problem solving abilities. Students following the software track also develop skills in networks, databases, and algorithms, while those in the hardware track develop skills in electronic circuits, digital electronic devices, and communications.

Historically, these two tracks have been administered independently by the CISE (software) and ECE (hardware) Departments, with students being advised and admitted through the respective departments. Since 1998 [CISE-ECE-governance], the program has been administered jointly by the two departments. Coordination of the program has in the past been carried out via a joint oversight committee. While this structure was effective in providing an excellent educational program, it was often unwieldy and somewhat inefficient to administer, particularly in light of the increasing need for assessment of student performance. As part of

our on-going program improvement process, in 2006 it was decided to revamp the administrative structure of the program. The new streamlined structure has created a single faculty body (the CE faculty, to oversee the assessment and operation of the program.

The last ABET general review of the CE program was in the Fall of 2006. No concerns, weaknesses or deficiencies were raised.

Specific changes to the program since the last general review are:

- 1. Our Data Structures and Algorithms course (COP-3530) has been switched from using Java as the instructional language to C++.
- 2. An additional laboratory hour was added to COP-3504 Introduction to CIS (formerly CIS-3020).
- 3. The option of students working in groups in COP 3504 (formerly CIS 3020) has been eliminated.
- 4. Java threading and synchronization has been added as topioc to COP-4600 Operating System
- 5. A MATLAB component has been added to EEL-3135 Signals and Systems, making it EEL 3135C with 4 credit hours.
- 6. The content of a number of courses has been modified, mostly to add topics, to follow trends in the discipline.

The Computer Engineering program is currently undergoing a significant re-design and restructuring. This is discussed in detail in Section 4.D, including the proposed revision, its rationale, and its current status. Four guiding princples have been adopted for the revision:

- 1. The establishment of a Computer Engineering Core Competency.
- 2. More flexible specialization, replacing the current two-track system with certificate options in various specialization areas.
- 3. More explicit and clearer guidance and focus for students.
- 4. Implementation of the new program with no drastic changes to current course offerings.

#### C. Options

The Computer Engineering program at the University of Florida is jointly offered by two departments within the College of Engineering. These are the Computer and Information Science and Engineering Department (<u>CISE</u>), and the Electrical and Computer Engineering Department (<u>ECE</u>). The degree program has two tracks: the hardware track (CEE, housed in ECE) and the software track (CEN, housed in CISE). Students in each track are enrolled in their respective departments. The title of the degree is **Bachelor of Science in Computer Engineering**, regardless of track. Both departments offer additional undergraduate degree programs. The CISE department offers three other degree programs:

- Computer Science, through the College of Engineering.
- Computer Science through the College of Liberal Arts and Sciences.
- Digital Arts and Sciences, through the College of Engineering.

The ECE department also offers its primary undergraduate degree, Electrical Engineering. With this Self-Study Report, we seek accreditation for the Computer Engineering program.

#### **D.** Organizational Structure



The figure above shows the organizational structure of the CE program. The program is administered by the CE faculty, which consists of all CISE faculty, and all the ECE faculty. This structure was established through a set of governing procedures agreed to by both departments in 1998, and amended in 2006 to create the Computer Engineering Faculty [CISE-ECE-governance]. The CE Program Director is a member of the CEN faculty who has responsibility for overseeing curriculum-related issues in the CE program. The CE Director serves as the chair of the CE curriculum committee and is responsible for ABET accreditation of the CE program. He/she is appointed by the College of Engineering Associate Dean for Academic Affairs in consultation with the CISE and ECE Chairs and shall report to this Associate Dean.

#### E. Program Delivery Modes

The CISE and ECE departments jointly administer the Computer Engineering program. It is offered primarily in day mode. A few students elect to alternate one or more semesters of coop work (which counts toward one semester hour of technical elective when properly documented) with full time enrollment. Co-op students must otherwise satisfy the same curricular requirements as non-co-op students. While up to eight hours of co-op work may be applied toward elective requirements in this manner, it is rare that more than three hours of co-op are used. Far more common is for a student to receive a summer internship and apply for co-op credit for this experience. This can extend the time needed to complete the degree requirements. However, because all major requirements are offered each semester, the delay in graduation is minimal.

#### F. Program Locations

The program's primary locations are on the campus of the University of Florida. For the CEN track, the CISE Department is housed at E301 CSE Building. For the CEE track, the ECE Department is located at 216 Larsen Hall.

#### G. Deficiencies, Weaknesses or Concerns from Previous Evaluation(s)

The CE program's most recent ABET evaluation was in the Fall of 2006. No concerns, weaknesses or deficiencies were identified. The following strengths (from the 2006 ABET Evaluation draft report) were identified.

- 1. The ECE department established a grade of C+ requirement in certain pre-engineering mathematics and physics courses in Fall 2002. This has resulted in greater retention rates for Computer Engineering students.
- 2. The ability to function on multidisciplinary teams uses feedback from the supervisor, the instructor and the sponsor of the senior project in order to provide quantitative assessment measures.
- 3. The Computer Engineering Advisory Board is very involved with the program, interacting with the faculty and students several times a year as well as sponsoring senior projects and creating positions for interns and cooperative education students.

#### H. Joint Accreditation

The Computer Engineering program is not jointly accredited by more than one commission, nor is it seeking such a joint accreditation.

### **CRITERION 1. STUDENTS**

#### A. Student Admissions

Students in the Computer Engineering program are herein designated in general as CE students, and specifically as CEN (CISE Department, software track) students or CEE (ECE Department, hardware track) students. This is in accordance with the University Registrar's major designations. For admission to the program, all CE students are expected to have satisfied the pre-professional requirement within their first 60 university semester hours, with a grade point average of 2.5 or higher based on all attempts in the eight pre-professional courses (MAC 2311, 2312, 2313, MAP 2302, PHY 2048, 2049, CHM 2045, CHM 2046 or a biological/physical science) and a minimum grade in each of these course. For CEN students, the minimum is a C, while for CEE students, it is a C+. The hardware track students (CEE) have a more restrictive requirement due to the necessity for a stronger math and science background for the upper division EEL required courses and electives. The decision to do this for the CEE students was based on correlation of performance in these tracking courses and completion of the program, and discussed in the Self-Study of 2006 for the previous ABET Review. Lower division students who do not meet this requirement are reassigned to the Undecided Engineering major with the College of Engineering Student Services Office if eligible, or are required to change to majors outside the College of Engineering otherwise.

#### **B.** Evaluating Student Performance

#### **B.1.** Course grades

Students are evaluated in each course on a letter grade basis (A through E, where E denotes a failure). In GPA calculations, an A counts as a 4.0, and an E counts as a 0.0. In the past, "plus" grades added an extra 0.5 (so a B+ was worth 3.5). Prior to the summer term of 2009, there were no "minus" grades. Effective May 11, 2009, the University of Florida adopted the use of "minus" grades. The old and new GPA calculations are shown below. There is no A+ letter grade.

Grade	А	B+	В	C+	С	D+	D	Ε
Grade points	4.0	3.5	4.0	2.5	2.0	1.5	1.0	0

Grade	А	A-	B+	В	B-	C+	С	C-	D+ D D-		D-	Ε
Grade points	4.0	3.67	3.33	3.0	2.67	2.33	2.0	1.67	1.33	1.0	0.67	0

University of Florida grades, prior to May 11, 2009

University of Florida grades, effective May 11, 2009

Although some courses are offered on an S/U (Satisfactory/Unsatisfactory) basis, all courses taken for credit towards the Computer Engineering degree program must be taken for a letter grade.

#### **B.2. Student progress monitoring**

Student progress has been monitored each semester by the CISE Department's Student Services Center (SSC), which is staffed by two full-time advisors and one secretary. The ECE Department has an Undergraduate Studies Office (USO), where the primary advisor is Mr. Matthew Williams, and he is located in the Electrical and Computer Engineering Department. Since April 2012, advising has been consolidated to better serve CE students. Mr. Paul Rocha is the primary academic advisor for undergraduate CE students, with assistance from the CISE and ECE Student Services Offices. Others in Student Services Office are also qualified to serve as advisors, and the College of Engineering also assists in this regard. Students can speak with any faculty member about the profession and their career options. Faculty members are encouraged to speak with each student enrolled in their classes concerning guidance for the student's career goals. The Undergraduate Advisor directs students to speak with the Undergraduate Coordinators (Dr. Dougals Dankel in CISE and Dr. Henry Zmuda in ECE) or with a faculty member working in the students' areas of specialization.

One month prior to the University's registration period, an email is sent to all currently enrolled students informing them the necessity of seeing an academic advisor prior to registration for the following semester's classes. The College of Engineering places an advisement hold on each currently registered student that prevents the students from registering without speaking with an academic advisor. At the advisement appointment time, the student meets with the academic advisor to discuss the student's progress in the program and what courses the student should take for the next semester. The academic advisor then lifts the hold so the student can register through the Integrated Student Information System (ISIS). Students on a co-op assignment may email their academic advisor with the courses they want to take the following term. The academic advisor reviews it, advises the student of any changes that should be made in their schedule, and then removes the advisement hold, thereby allowing the co-op student to register.

Students are also reminded via email to check their SASS (Student Academic Support System) tracking audit. Students cannot register with ISIS until they have checked their audit. The SASS/Tracking degree audits are reviewed each semester, in the student's presence, to ensure that course and other requirements have been satisfied and that the student is making satisfactory progress toward his/her degree. Each time a change is made to the curriculum, the students are advised of the change through individual letters if the change will affect them.

Each department receives, every semester, a report listing those students with upper division, cumulative, or departmental grade point averages that are below 2.0. The department then places these students on college or departmental probation and an email is sent to each student summoning them into the CISE Department's Student Services Center (SSC), or the ECE Department's Undergraduate Student Office (USO). If the student wishes to remain in the program, a probation contract is written with the conditions of academic probation. Students whose grade point average, either UF cumulative or upper division, is between 2.00 and 2.99

are placed on Zero Deficit Counseling status. These students are advised to seek tutoring as well as to attend the College of Engineering Success workshops on time management, note taking skills, engineering study skills, problem solving for math, science & engineering, and test taking strategies.

In addition to departmental efforts, the University of Florida has established Universal Tracking. Universal Tracking is a system that monitors the progress of all undergraduate majors toward graduation. It is designed to help students find the best path to completion of their degree, to advise them into the most appropriate major as soon as possible, to provide feedback every fall and spring semester on their academic progress, and to ensure that all students receive academic advising from their advisors. Universal Tracking monitors the critical tracking courses (also called pre-professional courses) for all majors and provides feedback to the student and the advisor beginning with the fall semester of the freshman year. This immediate feedback helps the student determine if he/she has chosen the best major and is on track for graduation.

Students who are off track are notified in writing by the university. A hold is placed on their record and they cannot advance register until they have met with an academic advisor and formulated an alternative academic plan at which time the academic adviser removes the hold. A student who is off track for two consecutive terms will be required to change to a different major.

#### **B.3.** Course prerequisites.

The on-line University of Florida Integrated Student Information System (<u>ISIS</u>) does not allow a student to register for a course unless he/she has satisfied the prerequisites. Exceptions, although rare, can be authorized by the faculty member who will teach the course requiring the pre-requisite. The majority of these situations are those in which a student wishes to take a course concurrently with one of its prerequisites, often as a chance to repeat the pre-requisite course without falling behind in the program. The authorization must be sent in writing to the SSC or USO, and an advisor will authorize it on ISIS so the student can register.

#### C. Transfer Students and Transfer Courses

#### C.1. Transfer students

Transfer student applications are first screened by the Registrar's office for general, universitywide requirements. Applications are then forwarded to the respective departments (ECE or CISE). The Department checks the appropriateness of the courses required for the major, and makes a recommendation to the College of Engineering. The College makes the final admission decision.

Freshman and sophomore transfers must meet University admission requirements. The individual department accepts upper-division transfer students, using the critical tracking criteria. Students transferring with more than 60 hours of course work must have completed a minimum number of critical tracking courses with a minimum GPA as established by the college and the department. Students transferring from a community college must have

completed their Associate of Arts degree as well as meet the critical tracking criteria. The minimum requirements to transfer into the Computer Engineering program are summarized below [transfer-student-requirements], and appear on the respective department websites.

- Completion of an Associate of Arts degree (Florida community college Students only)
- An overall 2.7 GPA (Fall 2004, Spring 2005, and Summer 2005 applications)
- An overall 3.0 GPA (Fall 2005 and later applications)
- Completion of six of the eight critical tracking (CT) courses prior to first term of enrollment at UF:
- A combined 2.5 critical tracking GPA throughout the completion of all eight critical tracking courses

#### C.2. Transfer courses

Course work from other universities is evaluated on a two-step basis. First the Office of Admissions verifies that the courses earn college credit from an accredited university and can be posted on the student's UF transcript. The SSC or USO, along with faculty who teach the material, then evaluate the course to ensure it meets any of the specific degree requirements for that student's program. Upper division computer courses from public 4-year universities in Florida will generally have the same course prefix and number as the course taught here at UF. If this is not the case, or the course was taken at an out-of-state school or private university, the course must be evaluated and approved by a CISE or ECE professor who has taught the equivalent UF course within the last two years in order to fulfill the requirement. This is done on a case-by-case basis.

The acceptance of transfer credit is provided for both major and non-major courses. Courses taken in the state of Florida are accepted in accordance with the State-wide Course Numbering System (SCNS). The SCNS is used by all public post-secondary institutions in Florida and by two participating private institutions. The major purpose of this system is to facilitate the transfer of courses between participating institutions. It requires state institutions within Florida to recognize courses that the State has established to be equivalent. Courses that the State has evaluated and deemed equivalent are assigned the same three-letter prefix and the same last three digits. In general, transfer credit is allowed only for those courses that are closely coordinated by the State University System Articulation Committee. These include calculus, chemistry, physics, English, humanities and social science courses. Notable exceptions from automatic transfer of credit are courses with the last three digits in the range 900-999; internships, practica, study abroad courses; and graduate courses.

On an individual basis transfer credit may be given for major course work. However, a faculty member who teaches the UF equivalent course must approve the transfer. It is the responsibility of the student to provide documentation (catalog description, course syllabus, textbook, homework and test samples) of the course taken so that the content of the transferred course can be determined by the cognizant faculty member. If the program offering the course is not accredited by EAC/ABET, the evaluation is very strict. Often courses with the same theoretical content are not transferred due to lack of equivalence in the design or laboratory portion. General Education courses in which a student has earned a grade of 'C' or higher from another institution are normally acceptable for transfer credit. A maximum of 60 semester hours may be transferred from a community college.

This process ensures that departmental standards are met. Further assurance of the quality and performance of our students is maintained by the University's 30-hour rule, which states that all students must complete the last 30 hours prior to graduation at the University of Florida. Petitions to approve a student taking a course elsewhere that falls into the last 30 hours must be approved by the relevant department curriculum committee, department chairman, and by the college faculty.

The Department of Electrical and Computer Engineering assigns two advisors to each student – a faculty advisor and an academic advisor. The purpose of the faculty advisor is to answer questions concerning the profession of Electrical Engineering and to assist the student in selecting specific technical electives courses that will meet the student's professional goals and interests. The purpose of the academic advisor is to provide curricular guidance, counseling, mentoring, curriculum planning, and to ensure that all degree requirements are met. The academic advisor is available to students on a walk-in basis during regular business hours.

#### D. Advising and Career Guidance

The CISE Student Services Center [SSC] staff has been handling professional advisement, degree requirements as well as the administrative responsibilities regarding student record keeping for the CISE department. The CISE Student Services Center currently has two undergraduate advisors, one graduate advisor, one graduate admissions advisor and one secretary and is supervised by the Associate Chair. In addition, the Career Resource Center (CRC) provides these services to all students on campus. A similar arrangement exists in the ECE Department, where the Undergraduate Studies Office (USO) offers a central location where students can obtain academic assistance.

Since April 2012, advising has been consolidated to better serve CE students. Mr. Paul Rocha is the primary academic advisor for undergraduate CE students, with assistance from the CISE and ECE Student Services Offices. Physically, Mr. Rocha is located at the ECE USO at Larsen Hall, which operates during normal business hours, mainly on a "walk-in" basis. An individual academic folder is created for each CE student that contains the student's photograph, audits by the Student Academic Advisement System (SASS), application for admission, correspondence, and forms processed by the student. The academic folder is kept in the USO. The purpose of the academic advisor is to provide academic advising, counseling, mentoring, curriculum planning and ensuring that all degree requirements are satisfied. Students can speak with any faculty member about the profession and their career options. Faculty is encouraged to speak with each student enrolled in their classes about the student's career goals.

#### E. Work in Lieu of Courses

The only work in lieu of courses that is allowed is University approved Advanced Placement and dual enrollment credit. Credit for these courses are evaluated and applied in the process of admission through the admissions and registrar offices.

#### F. Graduation Requirements

The name of the degree awarded in this program is **Bachelor of Science in Computer Engineering,** regardless of track.

Students are expected to complete their programs in a timely manner. Their progress is monitored through an on-line Student Academic Support System (SASS). The SASS report, or audit, is available to the student on-line via <u>ISIS</u>, the University of Florida's Integrated Student Information System. Graduating students are carefully screened to ensure that the published curricula has been followed and successfully completed. The list of degree requirements reflecting the most recent course prefixes and numbers is available on the CISE and ECE Department websites.

All students are required to have a final degree check and to fill out a degree application by the end of the third week of their last semester of courses. This is to ensure that in their final semester they register for all the remaining courses required for their degree. Graduating seniors are encouraged to check with the SSC prior to the end of the drop/add period to be sure they have correctly registered for all necessary classes. An additional check is made approximately halfway through the semester before preliminary degree certification to be sure all requirements for graduation have been met. Final degree certification takes place the day after final grades are due.

The CE degree requirements consist of:

- 18 credit hours of general education requirements
- 21 credit hours of mathematics
- 8 credit hours of physics
- 7 credit hours of chemistry/biology
- 5 credit hours of the engineering core
- 48 credit hours of Computer Engineering major courses
- 1 credit hour of Ethics
- 18 credit hours of Technical Electives

The complete list of the requirements are listed on each department's website and in the UF Undergraduate Catalog under <u>Computer Engineering</u>.

#### G. Transcripts of Recent Graduates

The program will provide transcripts from some of the most recent graduates to the visiting team along with any needed explanation of how the transcripts are to be interpreted. The team chair will request these transcripts separately. The program and any program options will be designated on the transcript. (See 2011-2012 APPM, Section II.G.4.a.)

### **CRITERION 2. PROGRAM EDUCATIONAL OBJECTIVES**

#### A. Mission Statement

## **A.1.** University of Florida Mission Statement (from the University of Florida Undergraduate Catalog):

The University of Florida is a public land-grant, sea-grant and space-grant research university, one of the most comprehensive in the United States. The university encompasses virtually all academic and professional disciplines. It is the largest and oldest of Florida's eleven universities, a member of the Association of American Universities and has high national rankings by academic assessment institutions. Its faculty and staff are dedicated to the common pursuit of the university's threefold mission: teaching, research and service.

The University of Florida belongs to a tradition of great universities. Together with its undergraduate and graduate students, UF faculty participate in an educational process that links the history of Western Europe with the traditions and cultures of all societies, explores the physical and biological universes and nurtures generations of young people from diverse backgrounds to address the needs of the world's societies.

The university welcomes the full exploration of its intellectual boundaries and supports its faculty and students in the creation of new knowledge and the pursuit of new ideas.

- **Teaching** is a fundamental purpose of this university at both the undergraduate and graduate levels.
- **Research and scholarship** are integral to the educational process and to the expansion of our understanding of the natural world, the intellect and the senses.
- Service reflects the university's obligation to share the benefits of its research and knowledge for the public good. The university serves the nation's and the state's critical needs by contributing to a well-qualified and broadly diverse citizenry, leadership and workforce.

The University of Florida must create the broadly diverse environment necessary to foster multi-cultural skills and perspectives in its teaching and research for its students to contribute and succeed in the world of the 21st century.

These three interlocking elements — teaching, research and scholarship, and service — span all the university's academic disciplines and represent the university's commitment to lead and serve the state of Florida, the nation and the world by pursuing and disseminating new knowledge while building upon the experiences of the past. The university aspires to advance by strengthening the human condition and improving the quality of life.

## A.2. Computer Engineering Program Mission Statement (from the University of Florida Undergraduate Catalog):

- To educate undergraduate and graduate majors as well as the broader campus community in the fundamental concepts of the computing discipline,
- To create and disseminate computing knowledge and technology, and
- To use our expertise in computing to help society solve problems.

#### **B.** Program Educational Objectives

The Computer Engineering Program Educational Objectives are listed in the University of Florida Undergraduate Catalog:

### Three to five years after graduating with this degree, a Computer Engineering graduate will:

- 1. Excel in a career utilizing their education in Computer Engineering;
- 2. Continue to enhance their knowledge;
- 3. Be effective in multidisciplinary and diverse professional environments
- 4. Provide leadership and demonstrate professional integrity.

These Program Educational Objectives are published in the UF Undergraduate catalog [<u>UF-catalog-CE</u>], and on the Computer Engineering website. [<u>CE-website</u>].

#### C. Consistency of the Objectives with the Mission of the Institution

We achieve our mission by producing graduates that achieve these objectives. It has been said that technology transfer is best accomplished through the transfer of people. Our graduates take what they have learned here and disseminate it into the environments where they live and work after graduation. As they succeed and achieve these objectives, they create and disseminate new knowledge and technology, thereby helping solve society's problems. The first element of our mission (education) is fulfilled by producing graduates who excel in their careers and are effective in diverse environments. The second element of our mission (creating and disseminating knowledge) is fulfilled by producing graduates who excel, continually enhance their knowledge, and provide leadership and demonstrate professional integrity. Finally, the third element of our mission (helping society solve problems) is fulfilled by producing graduates that achieve all four objectives. Therefore, the objectives of the program are consistent with our program's educational mission.

These objectives are also consistent with university's mission. Graduates that excel in a career and continue to enhance their knowledge must do so by pursuing and disseminating new knowledge. Graduates that are effective in diverse professional environments, and provide leadership and professional integrity, clearly strengthen the human condition and improve the quality of life.

#### **D.** Program Constituencies

We consider our significant constituencies to be:

- 1. Faculty
- 2. Alumni
- 3. Employers

The primary constituents of the process for establishing and reviewing, and assessing objectives are the faculty, the alumni, and the employers. The employers are represented by the Industrial Advisory Board (IAB), which consist almost exclusively of alumni. Alumni at large are the primary source of data for assessing objectives, through alumni surveys.

#### E. Process for Revision of the Program Educational Objectives

During the 2007-2011 period, the Industrial Advisory Board (IAB) was periodically consulted to determine whether the CE program objectives remained appropriate. We utilize the IAB as a vehicle to receive feedback on our programs in many ways. The IAB is populated by representatives of companies such as Amazon, Barr Systems, Citrix Systems, Dell, Exxon Mobil, Harris, IBM, Info Tech, Intel, Lockheed Martin, Microsoft, Milbank, Tweed, Hadley and McCloy LLP, Raytheon, Solidworks, Tower Hill Insurance Group, Turner Broadcast Systems, Vcom3D, and Walt Disney Camp. These companies hire both our hardware track and software track graduates, and they provide on-going, invaluable feedback on our program. The IAB meets twice a year [IAB-meetings], and we conduct both open discussions as well as questionnaires that IAB members use to give us their opinions on our programs. In 2005-2006, our previous Program Educational Objectives underwent a complete and thorough re-write. Rather than considering possible changes to the previous objectives, these were discarded and the new objectives formulated from scratch. The new objectives were established through discussions at a faculty retreat, and discussions with our IAB. After such a thorough revision, during 2007-2011, the IAB and faculty reviewed the objectives periodically, but suggested no changes.

- **i.** The Computer Engineering Program Oversight Committee (later streamlined to consist of the CISE ABET Coordinator) receives recommendations from the IAB, and extracts recommendations and possible objective revisions from the alumni surveys.
- **ii.** Any resulting recommendations are distributed, as necessary, to the appropriate administrative bodies (the CISE and/or ECE Curriculum Committee, Department Chairs, and/or space and facilities committees).
- **iii.** Recommendations for changes in the curriculum/objectives from committees are voted on by the CE faculty, and if passed, submitted to the College of Engineering for approval.
- iv. Changes are communicated to the IAB the following semester, and the process repeats.





Figure 2-1. Program Objectives Process Loop.

Although the IAB also represents alumni, the alumni at large are also surveyed annually [Alumni-surveys], both to assess the attainment of the objectives (see Criterion 4A), and to continue to assess and evaluate the attainment of the objectives. The alumni surveys suggested no changes to our Program Objectives during this period.

The process for revision of the objectives remained the same throughout 2006-2011. In 2012, the process was enhanced by naming a CE Program Director, and a CE Curriculum Committee consisting of three faculty from each Department. This committee has proposed a major revision to the program's curriculum, which is has not yet received final approval, nor has been implemented. These curricular changes are discussed in Section 4D.

### **CRITERION 3. STUDENT OUTCOMES**

#### A. Student Outcomes

Philosophically, the objective of the program leading to the degree of Bachelor of Science in Computer Engineering is to provide students with a strong theoretical and practical background in computer hardware and software, along with the engineering analysis, design, and implementation skills necessary to work between the two. A computer engineer is someone with the ability to design a complete computer system -- from its circuits to its operating system to the application programs that run on it.

The UF Computer Engineering program has the eleven outcomes listed in Criterion 3. In 2005, as part of an extensive re-examination of our objectives and outcomes, we tailored each of the eleven outcomes (a) through (k) to the specific context of Computer Engineering, eliminated some additional outcomes we previously had, and introduced the new outcome (l). In 2012 we reverted back to the outcomes (a) through (k), after feedback from a mock ABET visit in 2011, thus dropping outcome (l). These changes are discussed in Section 4D.

The program outcomes are published in the CISE and ECE Department websites [CISE, ECE]. Program criteria are well embedded in the outcomes. The mathematics and statistics criterion is included in outcome (a), basic science, engineering and Computer Science needed to analyze complex hardware and software systems is included in outcomes (a), (c), and (e), and the requirement for breadth and depth is included primarily in outcomes (c), (e), (h), and (k). Whenever knowledge of and ability to use mathematics, statistics, and probability are assessed, they are done so in the context of Computer Engineering problems. When considering a complex system (such as a complete computer or an operating system), analysis is indispensable to implement a successful design. Breadth cannot be measured in a single course as an outcome per se, but by the breadth in the curriculum and measurement of the ability to design, to formulate and solve problems, and to use modern methods and tools in several courses with very different subject material, assessment of breadth is achieved. The outcomes of the Computer Engineering Program are as follows.

A graduate of the Computer Engineering program will demonstrate:

- a. an ability to apply knowledge of mathematics, science, and engineering
- b. an ability to design and conduct experiments, as well as to analyze and interpret data
- c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- d. an ability to function on multidisciplinary teams
- e. an ability to identify, formulate, and solve engineering problems
- f. an understanding of professional and ethical responsibility
- g. an ability to communicate effectively
- h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

- i. a recognition of the need for, and an ability to engage in life-long learning
- j. a knowledge of contemporary issues
- k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

#### B. Relationship of Student Outcomes to Program Educational Objectives

Here we describe how the student outcomes prepare graduates to attain the program educational objectives. First, **Table B-3-1** maps the strength of interaction between each PEO and each PO. **Table 3-B-1 shows that each of the program objectives is supported by multiple outcomes.** 

		Program Educational Objectives								
Program Outcomes (abbreviated)	1) Excel in Career	2) Continue to Learn	3) Effective in Diverse Environments	4) Leadership and Integrity						
a) Apply math, science, engineering	S	S	М							
b) Design experiment, analyze data	S	М	М							
c) Design system, component, or process	S	М	М	М						
d) Function on multidisciplinary teams	S	М	S	S						
e) Solve engineering problems	S	М	М	М						
f) Understand prof., ethical responsibility	М		S	S						
g) Ability to communicate effectively	S	М	S	S						
h) Understand impact of eng. solutions	S	М	S	М						
i) Recognize need for lifelong learning	S	S	S	М						
j) Knowledge of contemporary issues	S	М	М	S						
k) Ability to use eng. Techniques, tools	S	S	М	М						

 Table 3-B-1. Relationships between program objectives and program outcomes

 Key: S = Strong relationship; M = Moderate relationship

#### (a) an ability to apply knowledge of mathematics, science, and engineering

The three primary foundations of Computer Engineering are calculus, discrete mathematics and physics. Calculus is the foundation for any engineering endeavor. Discrete mathematics is the basis for the Computer Science related components of the program. Physics is the basis for the Electrical Engineering related components of the program. Students must have a firm foundation in math, science, and engineering in order to apply that knowledge to solve Computer Engineering problems in any career that utilizes a Computer Engineering education (objective 1). Mathematics and engineering techniques are part of the required analysis, design, and implementation skills, which are necessary to enhance further knowledge in the field (objective 2). Effectiveness, including on teams (objective 3), depends in part on technical competence, which is supported by outcome (a).

#### Outcome (a) strongly supports objectives (1) and (2), and objective (3) moderately.

(b) an ability to design and conduct experiments, as well as to analyze and interpret data

The Computer Engineering curriculum includes required laboratory experience that combines elements of theory and practice in the area of general science, computer fundamentals, and engineering applications. These skills are reinforced in many of the technical electives, and are necessary to solve problems in a successful career (objective 1) and to be effective on teams (objective 3). The same skills are also necessary to enhance further knowledge in the field (objective 2). Statistics is a key component of the curriculum as well. One could also argue that proper interpretation of data is also necessary for effective leadership.

#### Outcome (b) strongly supports objective (1), and objectives (2) and (3) moderately.

# (c) an ability to design hardware and software systems, components, or processes to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

Our curriculum requires the student to design many systems involving software or hardware, or systems that require a synthesis of the two. The first step of the software engineering process is to develop a specification and ensure that it meets the needs of the customer. Subsequently, a system (software and/or hardware) must be designed to meet those specifications. Any useful design must meet ethical, legal, and social constraints. Ongoing enhancement of knowledge (objective 2) is also supported by this outcome. The ability to design appropriate systems and processes is important to being an effective team member and for leadership.

#### Outcome (c) strongly supports objective (1), and objectives (2), (3) and (4) moderately.

#### (d) an ability to function on multi-disciplinary teams

Computer engineering is a cross-cutting discipline in that it is applied in a wide variety of domains. Furthermore, it is itself a multi-disciplinary domain, bringing together relevant aspects of Computer Science, Electrical Engineering, applied mathematics, and statistics. Practically any team experience in Computer Engineering is thus fundamentally a multi-disciplinary activity. Solving large problems in Computer Engineering requires a team effort. Engineers work with one another to combine their strengths. The level of work and depth of detailed knowledge of all the components of a solution are too great to be handled by a single person. Large system projects require teamwork in order to be effectively carried out, and the objectives will be met with different levels of competence by each computer engineer Thus, this outcome strongly supports career success, effectiveness in diverse environments, and leadership. It also moderately supports continuing knowledge enhancement.

#### Outcome (d) strongly supports objectives (1), (3), and (4), and objective (2) moderately.

#### (e) an ability to identify, formulate, and solve engineering problems

Computer engineering involves problem solving at two levels – the use of computer technology (hardware and software) to solve a useful real-world problem, and the problem solving ability required to design and develop a computer system (hardware and software). These skills strongly impact career success, and moderately impact effectiveness in diverse environments and leadership. Recognition of the need to continue to learn about various problem solving tools and methods comes about from observation of the astounding advancements that continue to be made in the field.

#### Outcome (e) strongly supports objective (1), and objectives (2), (3), and (4) moderately.

#### (f) an understanding of professional and ethical responsibility

Some of the ethical, legal, and social issues in Computer Engineering are the same as in any area of engineering, while some are specific to Computer Engineering itself, such as electronic privacy issues, software copyright and intellectual property (IP) issues, computer crime, patents of mathematical relationships (algorithms), etc. This outcome moderately affects career success, but strongly impacts multi-disciplinary environment effectiveness and leadership. Due to the continuing struggle of society and the legal systems around the world to deal with issues of IP, computer crime, etc., our graduates will continue have an incentive to stay abreast of developments in these areas.

#### Outcome (f) strongly supports objectives (3) and (4), and objective (1) moderately.

#### (g) an ability to communicate effectively

Without good communication between team members, effective teamwork and leadership (and thus objectives 3 and 4) become impossible. When faced with a large multidisciplinary problem, a single engineer rarely has an adequate depth of knowledge in all areas needed to solve the problem. Computer engineers must complement each other with their distinct knowledge, and combine their strengths. This cooperative effort requires good communication skills. Without good communication between engineers, managers, and customers, the specification of a problem and the needs of the customer will be ill-stated, incomplete, and likely flawed. Further, success in selling a project (internally or externally) or promoting a company hinges in part on good presentation skills. Communication skills thus moderately impact knowledge enhancement, but strongly impact career success, effectiveness in diverse environments, and leadership.

#### Outcome (g) strongly support objectives (1), (3) and (4) ), and objective (2) moderately.

## (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

Understanding the impact of engineering solutions in their larger context is crucial to a successful career, and to operate effectively in multi-disciplinary environments. In a less crucial manner, this outcome impacts enhanced learning and leadership.

## Outcome (h) strongly supports objectives (1) and (3), and objectives (2) and (4) moderately.

#### (i) a recognition of the need for, and an ability to engage in life-long learning

This outcome is essentially the same as for any engineer. Since computing techniques change so rapidly, some aspects of the knowledge of a computer engineer quickly become obsolete, while others (such as the mathematical foundations of Computer Science) remain constant. Without outcome (i), a computer engineer's knowledge becomes obsolete within a few years, making all four objectives unattainable, especially objectives 1 and 2. To work in diverse disciplinary, ethnic, or cultural environments, one must be open to learning foreign ways. Hence, this outcome also strongly supports objective 3.

#### Outcome (i) strongly supports objectives (1), (2), and (3), and objective (4) moderately.

#### (j) a knowledge of contemporary issues

This outcome is essentially the same as for any engineer. Knowledge of contemporary issues at the time of graduation is essential to career advancement and leadership, and moderately important to continuing knowledge enhancement and effectiveness in multi-disciplinary teams.

#### <u>Outcome (j) strongly supports objectives (1) and (4), and objectives (2) and (3)</u> <u>moderately.</u>

## (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Computer Engineering graduates must be equipped with an ability to use modern computing techniques and skills, and software and hardware tools needed to solve Computer Engineering problems, at both levels of problem-solving discussed in outcome (e). Such skills strongly impact career success and continuing enhancement of knowledge, and moderately impact effectiveness in multi-disciplinary environments and leadership.

## Outcome (k) strongly supports objectives (1) and (2), and objectives (3) and (4) moderately.

### **CRITERION 4. CONTINUOUS IMPROVEMENT**

#### A. Program Educational Objectives

#### Description of the assessment process.

The primary process for assessing and evaluating the objectives consists of analyzing and evaluating our annual alumni survey [<u>Alumni Surveys</u>]. As part of the reformulation of our outcomes and objectives in 2005, we decided to collect evidence of specific accomplishments by our alumni that would demonstrate attainment of the objectives. The annual alumni survey includes the questions shown in Table 4-1.

YES/NO Questions	Obj 1	Obj 2	Obj 3	Obj 4
Attended graduate school?		Yes		
Received an advanced degree?		Yes		
Authored technical papers?	Yes			Yes
Attended any technical conferences?	Yes	Yes		Yes
Participated in continuing education?		Yes		
International activities?			Yes	
Contributions to employer?	Yes			
Employed in Computer Engineering?	Yes			
Mentored junior staff?	Yes			Yes
Made ethical decisions?			Yes	
Dealt with financial, legal, cultural constraints?	Yes			
Leader/Member/No Questions				
Member or leader of a multidisciplinary team?	leader		lead/mem	leader
Leader or member of a professional society?	leader	member		leader
Leader or member of volunteer group?			lead/mem	leader
Participate in community outreach?			lead/mem	
Rank 1-5 Questions				
Number of promotions received?	>=1			>=1
Prepared to deal with ethical decisions?			>=3	
Make presentations?	>=3			>=3
Adequately prepared for career?	>=3	>=3		>=3
Objective 1 (excel in career)?	>=2			
Objective 2 (enhance knowledge) ?		>=2		
Objective 3 (diverse environments) ?			>=2	
Objective 4 (provide leadership)?				>=2

 Table 4-1. Alumni survey questions and their relevance to the objectives.

The survey asks four types of questions:

- Yes/No questions.
- Leader/Participant (or member)/None questions.
- Questions in which the respondent enters a ranking on a 1-5 scale. These include four questions (one per objective) on how well the alumnus believes they have achieved the objectives, and four others (also one per objective) ranking the suitability of the objective.
- Five other questions. These are: the year of graduation, their field of employment, whether their employer has ever been fined for environmental issues, the graduate school the alumnus is attending, and suggestions for additional objectives. These five were not included in the statistical analysis. The last two (graduate schools and suggestions) are discussed in item A-4 below.

Table 4-1 maps these questions to the objectives.

#### For us to consider an objective to be attained by an alumnus, the alumnus must say that they have attained it, and must also have achieved one or more of the specific accomplishments that are relevant to that objective.

In short, for the objective to be attained, the alumnus must say they did, and provide evidence of it elsewhere in the survey. For example, following column "Obj 4" in Table 4-1, for an alumnus to be considered to have attained Objective 4 (provide leadership), the alumnus **must rank their attainment of Objective 4 as a 2 or higher, AND one or more of the following:** 

- Authored technical papers,
- Attended technical conferences
- Mentored junior staff
- Lead a multidisciplinary team
- Lead a group in a professional society
- Lead a volunteer group
- Been promoted at least once
- Been required to make presentations (3 or better)
- Rate herself to be adequately prepared for her career (3 or better).

#### Frequency of the assessment processes

We collect the alumni surveys, process them statistically, and evaluate the attainment of the objectives, annually.

#### Expected level of attainment of the objectives

We expect 90% (on average) of our alumni to attain each of the objectives. Summary of Results and Analysis.

	2007	2008	2009	2010	2011	07-11		
Number of respondents		112	46	58	31	319		
YES/NO Questions	YES							
Attended graduate school?	39%	38%	48%	48%	61%	47%		
Received an advanced degree?	29%	24%	33%	45%	52%	37%		
Authored technical papers?	10%	11%	14%	16%	35%	17%		
Attended any technical conferences?	39%	50%	57%	50%	65%	52%		
Participated in continuing education?	44%	58%	60%	43%	55%	52%		
International activities?	44%	63%	57%	57%	68%	58%		
Contributions to employer?	76%	81%	74%	76%	84%	78%		
Employed in Computer Engineering?	68%	69%	64%	72%	81%	71%		
Mentored junior staff?	60%	59%	60%	60%	71%	62%		
Made ethical decisions?	65%	66%	52%	64%	65%	62%		
Dealt with financial, legal, cultural constraints?	71%	77%	67%	72%	74%	72%		
Leader/Member/No Questions		L	eader o	or Mem	ber			
Member or leader of a multidisciplinary team?	68%	71%	72%	72%	68%	70%		
Leader or member of a professional society?	35%	30%	0%	19%	49%	27%		
Leader or member of volunteer group?	36%	43%	52%	40%	49%	44%		
Participate in community outreach?	60%	72%	60%	71%	84%	69%		
Rank 1-5 Questions	Mean							
Number of promotions received?	1.37	1.33	1.20	1.30	1.17	1.27		
Prepared to deal with ethical decisions?	4.31	4.11	4.55	4.28	4.50	4.35		
Make presentations?	3.57	3.52	3.50	3.71	3.84	3.63		
Adequately prepared for career?	3.94	3.76	3.71	3.84	3.80	3.81		
Objective 1 (excel in career)?	3.58	3.63	3.90	3.69	3.81	3.72		
Objective 2 (enhance knowledge)?	4.00	3.96	4.31	4.03	4.26	4.11		
Objective 3 (diverse environments)?	4.18	3.94	4.05	4.00	4.29	4.09		
Objective 4 (provide leadership)?	4.06	4.05	4.07	4.03	4.16	4.08		
Objective 1 suitable (excel in career)?	4.13	4.16	4.17	4.34	4.40	4.24		
Objective 2 suitable (enhance knowledge)?	4.29	4.22	4.36	4.12	4.20	4.24		
Objective 3 suitable (diverse environments)?	4.04	3.98	4.08	4.02	4.14	4.05		
Objective 4 suitable (provide leadership)?	3.94	4.05	4.19	3.93	4.10	4.04		
	Soft	ware T	rack (th	e rest a	re Hard	lware)		
Software (CEN) or Hardware (CEE)?	78%	66%	64%	64%	71%	69%		

Table 4-2: Summary of results, Alumni Surveys, 2007-2011.

Evaluation of Objectives	2007	2000	2000	2010	2014	2007-
Evaluation of Objectives	2007	2008	2009	2010	2011	2011
Objective 1 (excel in career) attained	93%	88%	89%	95%	90%	91%
Objective 2 (enhance knowledge) attained	97%	93%	98%	98%	100%	97%
Objective 3 (multi-disciplinary diversity) attained	92%	94%	91%	91%	100%	94%
Objective 4 (leadership) attained	99%	96%	100%	98%	97%	98%

 Table 4-3. Results of Evaluation of Objectives.

Results of the alumni survey for the period 2007-2011 are summarized in Tables 4-2 and Table 4-3. The complete statistical analysis, for each year and for the entire 2007-2011 period, appears in a single Excel spreadsheet, in [Alumni-survey-analysis]. Additional statistics for each annual survey also appear in [Alumni-surveys]. As shown in Table 4-2, we had an average of nearly 64 respondents each year to the survey. Nearly two-thirds of the respondents had been CEN students, and the rest had been CEE students. Since this roughly corresponds to the graduation rate of each track, we conclude that the surveys introduce no bias in favor of either track. More than two-thirds of the respondents are employed in Computer Engineering. About half have attended graduate school or other formal education, and nearly a third have earned additional degrees. One-fifth have authored technical papers, and more than half have attended technical conferences. About half have engaged in continuing education, and more than half have worked with customers/vendors/colleagues outside the United States. 78% say they have made significant technical contributions, 62% say they have mentored junior colleagues, and 62% say they have been involved in making ethical decisions in their workplaces. 72% say they have dealt with financial, legal, or cultural constraints. Although fairly few (27%) are members of professional societies, 70% have been leaders or members of multidisciplinary teams, and about half have done volunteer or outreach work. The majority of them have been promoted at least once (1.27 times on average), most say they are prepared to make ethical decisions (4.35/5.0 ranking), most are required to make presentations as part of their duties (3.63/5.0 ranking), and most say they were better prepared by our program than colleagues from other institutions (3.81/5.0 ranking, Go Gators!).

Table 4-3 summarizes the results of our evaluation of the objectives. As stated earlier, we expect 90% of our alumni to attain each of the objectives. Objective 1 (excel in career) fell (slightly) below this expectation in 2008 and 2009. However,

### the averages over the entire period show that each objective is indeed attained by 90% or more of our surveyed alumni.

The alumni survey collects additional information from our graduates. Here we discuss two items: the graduate schools our alumni attend, and their suggestions for improvement/additions to the objectives. The list of graduate schools attended by our alumni is impressive:

University of Florida (ECE, CISE)	Georgia Institute of Technology
University of Georgia	University of Florida (Law, Education)
Stetson Nova Southeastern University	New York University
University of South Florida	Florida Institute of Technology
Mercer University	Harvard Business School
University of Maryland	Florida State University
Stetson University College of Law	Old Dominion University
Florida Atlantic University	Columbia University
Fordham Law	University of North Florida
Midwestern State University	Virginia Polytechnic University
University of Colorado at Boulder	University of Central Florida

Pacific College of Oriental Medicine	North Carolina State University
Colorado State University	Boston University (MBA)
University of California, Los Angeles	Cornell University
American University, Law	University of Virginia
George Mason University	Technion: Israel Institute of Technology
Carnegie Mellon University	University of California – Berkeley
University of New South Wales, Australia	Old Dominion University
Air Force Institute of Technology	Embry Riddle Aeronautical University
George Washington University	University of Minnesota

Finally, the alumni survey collects suggestions for additional objectives. We summarize here the responses that constitute feedback to the program. Although the survey question requested additional objectives, many alumni appear to have taken the opportunity to make general (and sometimes very specific) suggestions on the program, and to other graduates [Alumni Surveys-Analysis].

- Testing, debugging, testing developed applications!
- Strong ethical education focusing on more real world cases. I'd like to see something more than 1 credit hour.
- Adaptability to changing job situation and opportunities.
- Work experience with internships and Co-ops should be the highest priority for current students and administrative goals.
- Courses with objectives to develop business sense and financial accounting should be included in list of electives as many projects revolve around financial solutions.
- Communicate during clearly and effectively in both writing and speaking/presentations
- Effectively assess the market and take opportunities where needed. Adapted to the changing environment/industry.
- Better understanding of the employment and business models of computer companies.
- Teach students not only how to write software... but also how to arrive at the most EFFICIENT solution.
- The only real suggestion I can offer is please put more emphasis on the relationship between hardware and software.
- Provide a commitment to/and positive relationship for future growth & cooperation between the student and university.
- Effective communication skills are a must
- Expect change and adapt to it fairly quickly
- Prepare students with relevant technical work.
- All the objectives above are too vague to have any meaning.
- Provide more opportunities to allow students to pursue diverse topics relating to Computer Engineering
- The CE program at UF had a combination of software and hardware instruction that has proven vital to growth in my current position as a DSP engineer.
- Figure out how to better retain your students.
- I think continuing to enhance knowledge goes without saying
- 1. Be knowledgeable in industry best practices and methodologies. 2. Demonstrate mastery in contemporary industrial and enterprise systems design and development including database management and administration as well as solutions design with industrial-quality modeling

tools and languages. 3. Confidence in project planning, management, solution design, team leadership, source control strategies, extreme programing, etc.

- Now that I'm attending graduate school outside the USA, I realize the difference in the level of university curriculum between the USA and the rest of the world (from speaking with other foreign students), or at least Israel.
- While it's nice to THINK that everyone from UF could excel in their careers, UF isn't MIT. Some people have to be average. Most of those from UF are.
- Entrepreneurship, Innovation, Making a Difference
- Leave out all of the community service nonsense from your metrics..
- More specific than "Excel"....more like be honored as a top employee/student
- Critical thinking skills. Less reliance on dogma. Learn in areas outside of comfort zone.
- Most of this questionnaire is written in a manner that is irrelevant

#### **Results documentation and maintenance.**

As mentioned above, all results of the alumni surveys for the period 2007-2011, and results of their statistical processing, appear in [Alumni-surveys]

#### **B.** Student Outcomes

#### Description of assessment processes.

#### **B.1.1 Direct Assessments**.

The process for direct assessment of outcomes has three components (items a,b,c below) [Assessment-forms].

a) Quantitative measurement of achievement of each outcome assessed in a subset of the required courses in the program. This analysis is performed and reported by the instructor of each course in the form of the per-course Course Outcomes Assessment report. Each semester, the instructor of each CISE and ECE course that is charged with assessing outcomes, fills out one Course Outcomes Assessment Form for each outcome that is assessed in the course. The instructor establishes the instrument(s) to be used to assess each outcome. These are typically questions embedded in student assignments, exams, quizzes, or other evaluative mechanisms. The instructor also establishes the Likert-scale threshold(s), which maps the instrument's scale set by the instructor (most likely the grading scale) to the 1-5 Likert scale for achieving each outcome. The instructor also supplies the relevant statistics for the course. These include the number of students, the grading scale and the average score for the embedded question, the score required to minimally achieve the outcome (Likert 2), the percentage of students who achieved the outcome, and the average Likert-scale value. Finally, the instructor makes any relevant comments regarding the achievement of the outcome. In addition, the instructor of each course prepares a set of course materials, which includes the course syllabus, copies of the Course Outcomes Assessment Reports, copies of the instruments used to assess the outcomes, and sample graded student work. The respective Departments store this information. These materials are the primary source

of information for the next level of the assessment process, the Course Committee Report. The outcomes assessed in each course, each semester, are shown in Table 4-4.

		Outc	omes									
Course #	Course Name	а	b	С	d	е	f	g	h	i	j	k
COP-3504	Introduction to CIS (CIS-3020)			х		х						х
COT-3100	Applied Discrete Structures	Х										Х
COP-3530	Data Structures and Algorithms	Х				Х						Х
CDA-3101	Introduction to Computer Organization	Х		Х		Х						
CEN-3031	Introduction to Software Engineering				Х			Х				
COP-4600	Operating Systems			х								Х
COT-4501	Numerical Analysis	х	Х			х						
CEN-4007C	Comp. Networking Fund. (CEN-4500C)		Х									Х
CGS-3065	Legal and Social Issues in Computing						Х		Х	Х	Х	
CIS/CEN-4914	Senior Design	х	х	х	х	х	х	х	х	х	х	х
EEL-3111C	Circuits 1	х										х
EEL-3135	Discrete-Time Signals and Systems	Х										Х
EEL-3308C	Electronic Circuits 1		Х	х						х		
EEL-3701C	Digital Logic and Computer Systems			Х								Х
EEL-4712C	Digital Design	х		х		х						Х
EEL-4744C	Microprocessor Applications	Х		Х		Х		Х				Х
EEL-4914C	Senior Design		Х	х	Х	х	х	х	Х	х	х	х

 Table 4-4.
 Course-Outcomes Assessments Mapping.

- b) Qualitative evaluation of the achievement of all outcomes assessed in each course. This evaluation is performed and reported by a course committee, consisting of at least three faculty members who are involved in either teaching the course or otherwise have expressed interest in it. This committee makes recommendations and suggestions for improvements in the course and its relation to other courses in the curriculum, improvements in the achievement of the outcomes, and improvements in the process itself. They produce the <u>Course Committee Evaluation</u> report containing their evaluations and recommendations. Each semester, the course committee is convened by the instructor of each course in which program outcomes are assessed. As mentioned earlier, this includes ten CISE courses, and seven ECE courses. The course committees for all semesters from 2007 to 2012, along with the messages sent to faculty rwequesting the assessments, appear in <u>Course Committees</u>. Each committee is tasked with the following:
  - i. To evaluate the course in terms of its contents and its place within the curriculum.
  - ii. To perform a *qualitative* analysis of the quantitative data in the Course Outcomes Assessment Report and course materials supplied by the instructor.
  - iii. To examine, evaluate, and ratify the quantitative criteria used, the instruments chosen, the statistics provided, the Likert scale values used, and the sample student graded work.
  - iv. To generate suggestions/recommendations in three categories:

- (i) Recommendations to future instructors.
- (ii) Recommendations to curriculum governance.
- (iii) Recommendations on improvement of the process.

The course committee's findings are recorded on the <u>Course Committee Evaluation</u> form. The form has three parts:

- i. Course issues, such as the adequacy of the textbook
- ii. Program Issues, such as course pre-requisites
- iii. Evaluation of Outcomes.

The course committee fills in one table per outcome assessed in the course, with *evaluative* comments on the instruments chosen, the statistics provided, the Likert scale values used, and the sample student graded work. The Course Committee Evaluation Reports from the courses in which outcomes are assessed are collected by the ABET Coordinator, for the third and final component of the program outcomes assessment process.

c) Overall analysis of the achievement of each outcome, across all courses in which it is assessed. This analysis is performed by the CISE ABET Coordinator, who analyzes the reports produced by each individual course committee, collects (and generates further) recommendations for improvements at all levels, directs those recommendations to the proper governance bodies, and follows up on actions triggered by those recommendations. Once per semester, the ABET Coordinator collects the Course Committee Evaluation Reports from the courses that assess outcomes, and takes the "birds-eye" view of each outcome, examining the results and recommendations across all courses that assess that outcome. He also gathers any feedback from other, program-level indirect assessment mechanisms. The ABET Coordinator refers suggestions and recommendations to the proper governance bodies, particularly the CE Curriculum Committee, for consideration and/or action. The Coordinator is also charged with following up in subsequent semesters on such actions, and determining whether recommendations initiated earlier to address any shortcomings have engendered program improvements.

#### **Process Summary:**

Quantitative data are obtained in direct form from assessments administered by course instructors. These are validated by the Course Committees, and performance is normalized to the Likert Scale. Instructors apply the results of their assessments and Course Committee evaluations directly within their classes to remediate any shortcomings. Repeated underperformance triggers examination by cognizant instructors to determine whether it is the assessment mechanism or the learning that is the problem. If learning is the issue, then these instructors consider the materials covered and how they are addressed to consider alternatives.

The Course Committees evaluate courses and outcomes measured within each course qualitatively, and their reports, are sent to the ABET Coordinator.

The ABET Coordinator considers these issues at the program level. Each outcome is considered across all courses, and areas where improvement can be made in specific courses, in the curriculum as a whole, in the facilities, or in the assessment/improvement process itself, are considered. Course Report recommendations are cataloged, and forwarded to the appropriate governance or executive body. Issues from previous terms are tracked, and effects of changes monitored. Most often, the issues are sent to the Curriculum Committee for consideration, since curricular matters are the most common. However, at times the issues concern space, facilities, or other non-curricular matters. These are referred to the chair or to the appropriate committee. The ABET Coordinator may also consider quantitative data from national benchmarks, course grades and evaluations, as well as qualitative data from student focus groups, emails, Industdrial Advisory Board (IAB) discussions, and governance bodies, and indirect quantitative data obtained from student exit surveys.

#### **B.1.2. Indirect Assessments.**

Indirect assessments are carried out via student focus groups, and student exit surveys.

#### Student focus groups.

Annual student focus groups have been carried out in CEN-3031 Introduction to Software Engineering since 2009. Prior to that time they were carried out at a lower frequency (the first in 1999). The CEN 3031 course was chosen because it is required in both tracks, and because of its primary role in assessing outcome (d), ability to function on multi-disciplinary teams), and (g), ability to communicate effectively. Students develop software in multi-disciplinary teams in this course, and are required to make presentations on their projects during the semester. A full class period is reserved for this purpose. The students are shown the outcomes, and asked a number of questions about the quality of the program, including whether they think they have attained the outcomes, or are likely to attain them by graduation. The questions asked of the students appear in [Student-focus-groups]. Students are then given an opportunity to comment on the program. Comments fall into three categories:

- Suggestions for additional courses, or deletion of courses.
- Suggestions for modification of existing courses.
- Suggestions for changes in various course pre-requisites.

In the 2010 and 2011 focus groups, students were asked for their thoughts on some of the program changes being considered.

- Two-semester Senior Design?
- Mandatory group work in Senior Design?
- Should Java threading and synchronization be covered in Operating Systems?

- Is the lack of C++ a limitation?
- Should C++ be the language for Data structures?
- Should an extra lab hour be added to Intro to CIS?
- Should working in groups be forbidden in Intro to CIS?

In the 2012 focus group, students were asked to consider the curricular changes being considered by the CE Curriculum Committee [Student-focus-group-2012].

- Has advising to make early career choices been good?
- Are course offerings adequate?
- Are there any courses that should be dropped?
- Any courses to be added/merged?
- Any courses with problems?
- What do you think about COP 3502 in Java and COP 3503 in C++?
- What do you think about a two-semester senior design?

#### Student exit surveys

Students are asked to fill out an exit survey before they graduate. Students are asked the following questions:

- Post-Graduation Plans: (will attend graduate school, will be seeking employment, will be self-employed, will work in a company, Other).
- What means or services did you use to locate this position?
- What are the specific responsibilities for this position?
- What will your starting salary be? (Below \$30,000, \$30,000-35,000, \$35,001-40,000, \$40,001-45,000, \$45,001-50,000, \$50,001-55,000, \$55,001-60,000, \$60,001-65,000, \$65,001-70,000, above \$70,000)
- Did your undergraduate experience at UF allow you the flexibility to take the courses you wanted to take? (If no, please explain.)
- Were there any required courses that seemed unnecessary or irrelevant?
- Were there subject areas not covered by CISE courses that you believe should be in the future?
- Have you experienced any CISE course-related problems that you believe need to be improved? (If yes, please describe the nature of these problems.)
- Please rate the CISE Department's Undergraduate Advising services on a scale of one to five [Poor, Needs Improvement, Fair, Good, Excellent] (Availability, Professional Demeanor, Assisting with Academic Problems, Clarifying/Communicating Academic Requirements, Overall Effectiveness.
- How can Undergraduate Advising be improved?
- Indicate the amount of attention each of the following should be given by the CE program in the future. Options: [Much Less Attention, Less Attention, Same Amount of Attention, More Attention, Much More Attention] (Co-op/Internship Opportunities, Study Abroad Opportunities, Undergraduate Research Oppor-

tunities, Student Organizations/Clubs, Career Development Workshops, Graduate School Opportunities.

• Do you wish to stay in contact with the Department after graduation (receive Newsletters, etc.)?

The answers to these questions are analyzed statistically, and the results are shown in Section 4B.2.

#### Frequency of assessment processes.

The direct assessments are performed each semester. Whenever practical, this has included Summer terms. The indirect assessments are performed yearly. Annual student focus groups began in 2009. Data on student exit surveys are available beginning in 2008.

#### Expected level of attainment of each outcome.

Our overall goal is to ensure that 80% of the students achieve each outcome (on average) in each assessment, and an average Likert value of 3.0 or better.

#### **Results of evaluation process.**

#### **B.4.1 Direct Assessments**

Below is a summary of the results of the assessment process of each of our outcomes. The two critical figures in each table below are SAO (Percentage of Students Achieving the Outcome), and ALV (Average Likert Value). As mentioned above, in order to consider that an outcome has been achieved, we expect an average SAO of 80% or better, and an average ALV of 3.0 or better. Comprehensive assessment information and results for the 2007-2011 period, organized by year, by course and by outcome, appear in [Assessments].

Note to the ABET Evaluator: the Assessments portion of the CE program website contains sample graded student work, and is password-protected due to student record confidentiality. Please contact the Program Director to obtain login and password information.

In each table shown below, assessments values are averages for 2007-2011.

**Outcome a): an ability to apply knowledge of mathematics, science, and engineering;** We use eight different courses to assess this outcome. Two are early in the curriculum (Discrete Structures and Data Structures) and give us feedback on student preparation as well as their ability to apply concepts from math and statistics. In Numerical Analysis we can assess student ability to apply math and calculus to numerical problems. In Circuits I (EEL 3111C), we can assess student ability to use linear algebra and their understanding of work and energy. In Signals and Systems (EEL 3135), we can assess students' ability to solve differential equations using engineering techniques as well as their ability to work with complex numbers and exponentials. In either Senior Design course, we once again assess whether students have the basic tools they need to be successful in design. This outcome is also assessed in IPPD (Integrated Product and Process Design), a highly successful alternative capstone course option, discussed in Section 5A.6. The average percentage of Students Achieving the Outcome (SAO) and Average Likert Value (ALV), for 2007-2011, appear in the table below.

SUMMARY 2007-2011	SAO:	ALV:
COT 3100 Discrete Structures	76.5	3.4
COP 3530 Data Structures	73.5	3.3
CDA 3101 Computer Organization	79.3	3.8
7COT 4501Numerical Analysis	83.9	3.5
CIS 4914 Senior Design	94.2	4.5
EEL-4914C Senior Design	96.0	4.4
EEL 3111C Circuits 1	72.5	3.8
EEL 3135 Signals and Systems	74.2	3.6
EEL 4744C Microprocessors	90.5	4.25
Overall Averages	84%	3.5

**Outcome b): an ability to design and conduct experiments, as well as to organize, analyze and interpret data;** We use five different courses to assess this outcome. One is early in the program (Circuits 1), and it gives us feedback on student ability to conduct experiments. In Numerical Analysis we can assess student ability to conduct experiments in numerical problems. In Computer Networking, we can assess students' ability to conduct benchmarking experiments and analyze data related to networking traffic. In the Senior Design course (and IPPD), we once again assess whether students have the experimentation and analysis skills they need. Outcome (b) has been quantitatively assessed as follows:

SUMMARY 2007-2011	SAO:	ALV:
COT 4501 Numerical Analysis	70.8	3.6
CEN 4500C/4007C Networking	82.9	3.8
CIS 4914 Senior Design	96.0	4.4
EEL 3308C Electronic Circuits 1	100	4.2
EEL 4914C Senior Design	100	4.5
Overall Averages	90%	4.1

Outcome c): an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability; We use ten different courses to assess this all-important outcome. The design outcome is assessed from the earliest courses in the program, beginning with COP 3504 (formerly CIS 3020), where we assess student ability to design computer programs. Similarly, in Computer Organization, Circuits 1 and Digital Logic we assess student ability to design hardware components and
systems. Electronic Circuits I focuses on basic amplifiers and Digital Logic looks at design of digital subsystems and state machines. The primary software course in which we assess this outcome is Operating Systems, where we receive feedback on student ability to design components of such a large, complex system. In the Senior Design course (and IPPD), we again assess whether students have the design skills they need. Outcome (c) has been quantitatively assessed as follows:

SUMMARY 2007-2011	SAO:	ALV:
COP 3504 Adv Programming Fund. for CIS	83.5	4.2
COP 3502/3503 Programming Fund. for CIS	75.4	3.7
CDA 3101 Computer Organization	77.9	3.5
COP 4600 Operating Systems	75.3	3.8
CIS 4914 Senior Design	93.2	4.6
EEL 3308C Electronic Circuits 1	98	4.2
EEL 3701C Digital Logic	85	3.9
EEL 4712C Digital Design	99.0	4.4
EEL 4744C Microprocessors	90.5	4.2
EEL 4914C Senior Design	100	4.5
Overall Averages	86%	4.1

Outcome d): an ability to function on multi-disciplinary teams; We have focused on the small number of courses in which group work makes the most sense. This outcome is assessed primarily in the Software Engineering course (required by both tracks), in which group work is an inherent part of the course material. This course strongly emphasizes techniques and methodologies for collaborative efforts that are necessary for any significant software development project. The Senior Design course provides us with feedback on this outcome as well. Work group work is not required in the CISE Senior Design course, but it is required in the ECE Senior Design course. As an alternative to Senior Design course, students may apply for the Integrated Product and Process Design Program [IPPD] This highly successful program was begun in the Fall 1996 Semester. Engineering students of all disciplines seeking to enhance their qualifications through a practice-oriented program may apply for this program. Students that elect our Integrated Product and Process Design course are directly placed on interdisciplinary teams. We can then monitor how these students do as a sample of the student body at large. Generally, students are successful at these projects and that indicates their ability to function on teams. Some of these teams have attracted national attention and have been featured in the popular press. Spring of 2011 saw a hardware team build an unmanned ATV for firefighters and others working in high threat environments that will help them orient to their team members in hazardous conditions using GPS. A software team developed a Google-style search engine, to aid in the search for construction items (similar, but different across different states) in a large database of state infrastructure construction contracts. Several IPPD designs have developed into commercial products.

The goal of The IPPD program is to have students in their senior year practice engineering on real, industry-sponsored design projects to improve their engineering education and to enhance their opportunity for employment. The program provides both classroom and laboratory experience. Through this program, the student learns how fundamental engineering science is relevant to effective product and process design; that design involves not just project function but also producibility, cost, schedule, reliability, customer preference and life cycle issues; how to completed projects on time and within budget, that engineering is a multi-disciplinary effort. Working in small multi-disciplinary project teams, students get important practical experience in teamwork and communication as well as in developing their leadership, management and people skills. Each team is coached by a faculty member and interfaces with liaison engineers of the companies that sponsor design projects. Several design reviews are required throughout the two semesters and held at the companies. The IPPD program requires six hours of course work and is offered as a sequence of two three-credit courses (EEL 4912 and EEL 4913 in ECE, CIS 4914 and technical elective in CIS) during fall and spring terms of the senior year. These two courses are pre-approved substitutes for a technical elective and for the capstone course. The ECE department considers IPPD to be extremely important and therefore assigns 25% FTE to the faculty members involved as coaches. Extensive documentation of IPPD selfassessment is available. All ABET outcomes are assessed in IPPD, using the [IPPD Team] Outcomes Evaluation form].

SUMMARY 2007-2011	SAO:	ALV:
CIS 4914 Senior Design	87.3	4.3
CEN 3031 Software Engineering	92.7	4.4
EEL 4914C Senior Design	100	4.7
Overall Averages	93%	4.5

Outcome (d) has been quantitatively assessed as follows:

**Outcome e): an ability to identify, formulate, and solve engineering problems;** This outcome is assessed in six courses. We assess how well our students solve software problems in COP 3504 / 3502 / 3503 (formerly CISE 3020 / 3022 / 3023) and in COP 3530 Data Structures and Algorithms, where the fundamental tools in software are discovered, such as object-oriented programming, data structures, and algorithms. Problem solving in the hardware area is assessed in the Computer Organization (CDA 3101) course. Hardware issues related to error propagation and inexactness of data representation of numerical data on computers is assessed in COT 4501 Numerical Analysis. We once again assess this outcome in the Senior Design course.

SUMMARY 2007-2011	SAO:	ALV:
COP 3504 Adv Prog. Fund. for CIS	90.2	4.5
COP 3502 / 3503 Prog Fund. for CIS	88.8	4.2
COP 3530 Data Structures	71.2	3.2
CDA 3101 Computer Organization	72.8	3.4
COT 4501 Numerical Analysis	71.0	3.3
CIS 4914 Senior Design	93.3	4.6
EEL 4712C Digital Design	99.0	4.4
EEL 4744C Microprocessors	90.5	4.2
EEL 4914C Senior Design	100	4.9
<b>Overall Averages</b>	84%	4.0

**Outcome f): an understanding of professional and ethical responsibility;** We assess this outcome primarily in the Legal and Social Issues course, as well as Senior Design course, or IPPD, in which faculty supervisors of the students projects assess whether the students have achieve an understanding of the issues involved. Outcome (f) has been quantitatively assessed as follows:

SUMMARY 2007-2011	SAO:	ALV:
CGS 3065 Legal and Social Issues	93.3	4.6
CIS 4914 Senior Design	96.7	4.4
EEL 4914C Senior Design	96.0	4.4
Overall Averages	95%	4.5

**Outcome g): an ability to communicate effectively;** The University of Florida has always emphasized the need for effective communications for all students. All UF students must satisfy the "Gordon Rule" that requires a significant writing experience. Before graduation, students must have written 24,000 words across a minimum of four different courses. No course counts for more than 6000 words.

We also require all students to take a Technical Writing course (ENC 3245). This is a sophomore-level course that counts 6000 words against the Gordon Rule. The remaining writing comes from the student's selection of courses that fulfill the general education requirement of the university. We assess this outcome primarily in the Software Engineering course, as well as in Senior Design. Outcome (g) has been quantitatively assessed as follows:

SUMMARY 2007-2011	SAO:	ALV:
CIS4914 Senior Design	95.0	4.6
CEN-3031 Software Engineering	89.8	4.2
EEL 4744C Microprocessors	90.5	4.2
EEL 4914C Senior Design	100	4.1
Overall Averages	95%	4.3

**Outcome h): the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;** This is one of the most difficult outcomes to assess. We have a General Education requirement that should expose students to a global and societal context. Students are required to take a mix of both social sciences and humanities courses to fulfill general education requirements. Some of these must have an international focus as well. We assess this outcome in Senior Design. ECE students are asked to consider manufacturability and sustainability in their designs. CISE students are asked to consider maintainability of software in theirs. This outcome is primarily assessed in the Senior Design course, in which faculty supervisors of the student projects and the course coordinators perform the assessments. We also assess this outcome in CGS-3065 Legal and Social Issues in Computing. Outcome (h) has been quantitatively assessed as follows:

SUMMARY 2007-2011	SAO:	ALV:
CGS 3065 Legal and Social Issues	92.0	4.6
CIS 4914 Senior Design	95.9	4.5
EEL 4914C Senior Design	100	4.0
Overall Averages	96%	4.4

**Outcome i) a recognition of the need for, and an ability to engage in life-long learning;** This outcome is assessed primarily in the Senior Design course, along with two other courses, one in each department: Legal and Social Issues, and Electronic Circuits 1. Outcome (i) has been quantitatively assessed as follows:

SUMMARY 2007-2011	SAO:	ALV:
CGS 3065 Legal and Social Issues	92.0	4.6
CIS 4914 Senior Design	97.1	4.5
EEL 3308C Electronic Circuits	99.0	4.2
EEL 4914C Senior Design	100	4.0
Overall Averages	95%	4.4

**Outcome j): a knowledge of contemporary issues;** We assess this outcome primarily in the Senior Design course, where it is assessed by project supervisors and the course instructors. In addition, contemporary issues are at the core of the topics in the Legal and Social Issues in Computing, and this outcome is assessed there as well. Outcome (j) has been quantitatively assessed as follows:

SUMMARY 2007-2011	SAO:	ALV:
CGS 3065 Legal and Social Issues	92.0	4.6
CIS 4914 Senior Design	96.6	4.7
EEL 4914C Senior Design	100	3.0
Overall Averages	96%	4.1

**Outcome k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice;** This outcome is assessed in thirteen different courses. Techniques and tools for Computer Engineering practice are the mainstay of CE courses from the earliest stages in the program, beginning with CIS-3020. In Applied Discrete Structures, we assess how well our students master the mathematical techniques for determining the computational complexity of algorithms. This knowledge is applied extensively in Data Structures and Algorithms, and later in Operating Systems, Networks, and ECE courses. In Digital Logic, we assess how well students have mastered techniques and tools for designing basic hardware systems. In Signals and Systems, we assess how well they master the techniques and tools used in designing, building and analyzing communication systems. Finally, we once again assess this outcome in Senior Design, in which the techniques and tools students have learned in earlier courses are applied in their design projects. Outcome (k) has been quantitatively assessed as follows:

SUMMARY 2007-2011	SAO:	ALV:
COP 3504 Adv Programming Fund. for CIS	84.0	4.3
COP 3502 / 3503 Programming Fund. for CIS	79.8	3.8
COT 3100 Discrete Structures	75.1	3.4
COP 3530 Data Structures	79.0	3.5
COP 4600 Operating Systems	78.5	3.8
COT 4500C Numerical Analysis	78.2	3.7
CIS 4914 Senior Design	97.5	3.7
EEL 3111C Circuits 1	96	4.6
EEL 3135 Discrete Systems	92	3.2
EEL 3701C Digital Logic	88	4.0
EEL 4712C Digital Design	93.0	4.3
EEL 4744C Microprocessors	90.5	4.2
EEL 4914C Senior Design	96.0	4.4
Overall Averages	85%	3.8

#### **Overall Summary of Outcomes Assessments**

The above data is summarized by outcome in the table below. As can be seen in the table, the Average Likert Values (ALV) well exceed our expectations of an average of 3.0 or

better. In fact, the lowest average is 3.5, and most of them are above 4.0. Regarding the percentage of Students Achieving Outcomes (SAO), all of them are above 80%, with most of them rising above 90%.

SUMMARY	SAO:	ALV:
<b>OF OUTCOMES</b>		
Outcome (a)	85%	3.5
Outcome (b)	90%	4.1
Outcome (c)	86%	4.1
Outcome (d)	93%	4.5
Outcome (e)	84%	4.0
Outcome (f)	95%	4.5
Outcome (g)	95%	4.3
Outcome (h)	96%	4.4
Outcome (i)	96%	4.4
Outcome (j)	95%	4.1
Outcome (k)	85%	3.8
<b>Overall Averages</b>	91%	4.1

We conclude that each and every one of the outcomes, as assessed, has been attained by our students.

#### **B.4.2 Indirect Assessments**

#### **Student focus groups**

Annual student focus groups have been carried out in CEN 3031 Introduction to Software Engineering since 2009. This course was chosen because it is required in both tracks, and because of its primary role in assessing outcome (d), ability to function on multidisciplinary teams), and (g), ability to communicate effectively. Students develop software in multi-disciplinary teams in this course, and are required to make presentations on their projects during the semester. A full class period is reserved for this purpose. The students are shown the outcomes, and asked a number of questions about the quality of the program, including whether they think they have attained the outcomes, or are likely to attain them by graduation. Although no formal statistics are collected, the majority of the students invariably respond affirmatively (with occasional dissension), that they do believe they are attaining each of the outcomes. of the students appear in [Student-focus-groups]. Students are then given an opportunity to comment on the program. Comments fall into three categories. Below is a summary of the student comments, which appear in in [Student-focus-groups].

• Suggestions for additional courses, or deletion of courses. Results:

- Add a course on Web technologies;
- Add a course on iPhone/Android development;
- Add a course on C/C++ programming;
- Add a course on dynamic languages/system administrator languages;
- Add a course on computer security.
- Remove Numerical Analysis;
- Remove Database 2; replace it with the graduate course.
- Why do we need physics, chemistry?
- Too much math in the major.
- Suggestions for modification of existing courses. Results:
  - More Algorithms in Data Structures;
  - Use C++ in Data Structures;
  - C course weak on pointers;
  - Overlap between Digital Logic, Computer Organization, & Microprocessors;
  - Overlap between Signals and Systems, and Electronic circuits;
  - Overlap between Discrete Structures and Intro to CIS;
  - Cover threading and synchronization in Operating systems.
- Suggestions for changes in various course pre-requisites. Results:
  - Discrete Structures should be a co-requisite for the Database course;
  - C programming should be a pre-requisite for Operating Systems.

In the 2009 and 2010 focus groups, one particular issue appeared in all three categories: particular dissatisfaction was expressed due to the lack of an appropriate course in C/C++, particularly as a pre-requisite for Operating Systems. An existing course, CGS 3460 C Programming, is for non-majors. Majors may take it, but do not receive credit for it in the program. In the 2010 focus group, a resounding 100% answered "yes" to the question "Is the lack of C++ a limitation?"

# This feedback, as well as comments from the Data Structures course committees and the IAB, led to one of our primary program improvements, namely switching from Java to C++ in the Data Structures course (see Section 4C on Continuous Improvement).

In the 2010 and 2011 focus groups, students were asked for their thoughts on some of the program changes being considered.

- Two-semester Senior Design? Consensus: good as an option, but requiring it could be an unnecessary hardship.
- Mandatory group work in Senior Design? Consensus: not necessary.
- Should Java threading and synchronization be covered in Operating Systems? Consensus: Yes, although many have not yet taken it.

- Is the lack of C++ a limitation? Unanimous response: Yes.
- Should C++ be the language for Data structures? Consensus: Yes.
- Should an extra lab hour be added to Intro to CIS? Consensus: No.
- Should working in groups be forbidden in Intro to CIS? No consensus.

Although the students nearly unanimously thought it unnecessary to add an extra lab hour to COP 3504 (Advanced Programming Fundamentals for CIS), **this change is another one of our primary program improvements** (see Section 4C on Continuous Improvement). Although there was no consensus on whether working in groups should be allowed in COP 3504, **this was another of our program improvements** (see Section 4C on Continuous Improvement). Improvement).

#### Assessment results from the 2012 student focus group

The results of the 2012 student focus group are summarized below. The full minutes are appear in [<u>Student-focus-groups-comments-2012</u>].

- Has advising to make early career choices been good? Reply: Yes. The advisors are very helpful.
- Are course offerings adequate? Reply: There is a need for more summer courses, particularly to support students taking internships.

#### • Are there any courses that should be dropped?

Reply: There is some overlap between these three courses: CDA 3101 Computer Organization, EEL 3701C Digital Logic, and EEL 4744C Microprocessors. In the linear algebra and numerical methods courses, there is a need to spend time in MATLAB first. The topic is not relevant or useful for most students. Regarding the two-course intro programming courses (COP 3502, COP 3503): these are helpful for those with no experience at all, but one-semester is fine for most students. It is a prerequisite for digital logic, but the two courses are not related. Regarding the capstone senior design: internship & IPPD are far more valuable than Senior Design. Internships should count for senior project (or at least more credit).

#### • Any courses to be added/merged?

Reply: web technologies, user-interface, and online summer programming courses should be added. Need more software engineering integrated into the curriculum.

#### • Any courses with problems?

Reply: Data structures & Algorithms (COP 3530) needs a different textbook. The use of C++ reduces the effectiveness of the course. Students should learn C++ but not at the same time as data structures and algorithms. More online courses would make internships easier.

- What do you think about COP 3502 in Java and COP 3503 in C++? Students enthusiastically endorsed the idea
- What do you think about a two-semester senior design? Students had mixed reactions to the idea of a two-semester senior design, as well as making it mandatory to work in groups in senior design.

#### Student exit surveys

A summary of the exit surveys appears in <u>[Exit Surveys-Summary]</u>. We discuss the most significant results here:

- The average starting salary for our graduates is \$61,428.
- 78% thought the course availability was adequate.
- Courses most often mentioned as unnecessary: Digital Logic (14%), Numerical Analysis (6.5%), Engineering Core (4.7%), Chemistry (4.5%), Discrete Math (3.9%), General Education and Technical Writing (2.4% each), and a few others (Physics, Biology, Data Structures, Software Engineering) less than 1%.
- Topics most often mentioned as not required, but should be: C/C++ (29.1%), Web Design (8.6%), other languages (7.7%), Object-Oriented Programming/ Design Patterns (4.7%), Compilers/Linux (3.6%), Database and Computer Security (2.7% each), IDEs and Game Design (2.1% each), and others (.NET, Networking, Mobile Computing, Software Design, Distributed Computing, SQL, Parallel Computing, OpenGL, and Theory of Computation) at less than 1% each.
- Most common problems with courses: C/C++ (5.9%!), need to teach better (4.7%), too theoretical (2.7%), Professors/TAs that don't speak English (2.4%), Courses too hard or too easy (2.1%), Software Engineering (1.8%), and about a dozen others, each at less than 1%.
- On how to improve advising, 40.9% did not answer the question, and 16.6% said the advising was very good, for total of 57.5 having no thoughts on improving advising. 21.7% thought advisors require more knowledge of specific courses, and a few (3) though that the advisors should be engineers themselves. 7.1% mentioned that advisors should be retained longer. 7.8% said there should be more advisors or more availability, and 3.8% said there should be less paperwork. A half-dozen other improvements were mentioned, such as understanding student needs better and streamlining the advising appointments process, by 1% of the respondents.
- The rating of the advising was overall between good and excellent, at 4.14/5.0. The students rated the advisors highest on their demeanor (4.4/5), followed by their availability (4.2/5), their communication skills (4.0/5), and finally their ability to assist students (3.9/5).
- The remaining issues were whether the program should pay less/same/more attention to course offerings, internships, study abroad, undergraduate research, student organizations, career workshops, and graduate school. The averages on all

five were in the 2.4-2.9 range, which we interpret as "largely the same, but somewhat less". The highest was Course Offerings at 2.9, and the lowest, not surprisingly, were Study Abroad and Career Workshops, as the University does most of the Career Workshop advising.

The most significant of these is the role of C/C++ in the program, which was by far the most frequently mentioned course that the students considered should be required. It is noteworthy that this issue even spilled over into the "Problems with Courses" survey question, where the lack of C/C++ was mentioned more often than any kind of problem with any other existing course. This shortcoming, along with comments from the course committees, faculty meetings, and our IAB, led to one of our primary program improvements, namely switching from Java to C++ in the Data Structures course (see Section 4C on Continuous Improvement).

#### Documentation and maintenance of results.

Results of the outcomes assessments appear in [Assessments]. Transcripts of the focus groups appear in [Student Focus Groups]. Student exit surveys appear in [Exit surveys].

#### C. Continuous Improvement

During the 2007-2011 period we have made the following improvements to the CE program.

#### 1. Switching the Data Structures course form Java to C++.

As mentioned in previous sections, data from assessments by course committees in COP-3530 Data Structures and Algorithms, beginning in 2007 [Course Assessments], suggested that not requiring C/C++ programming was a program limitation. This was confirmed in IAB meetings [IAB meetings], where alumni expressed the need for covering memory management in either C or C++. Course instructors also expressed the need for students to have knowledge of C or C++ prior to taking COP-4600 Operating Systems. In the past, students who had no experience in C or C++ were asked to take CGS-3460 C Programming, but this course is for non-majors, and cannot be taken for credit towards the major by CE students. In addition, student feedback in exit interviews stated this course is too easy, and did not cover pointers and memory management in sufficient depth [Exit Surveys]. In the 2009 and 2010 student focus groups [Student Focus Groups], particular dissatisfaction was expressed due to the lack of an appropriate course in C/C++, as a pre-requisite for Operating Systems. In the 2010 focus group, a resounding 100% answered "yes" to the question "Is the lack of C++ a limitation ?" This change was discussed and approved in our Curriculum Committee in January 2010 [Curriculum Committee], and also discussed and approved in a CE faculty mini-retreat in March 2010 [CE faculty-mini-retreat]. This change required no further approvals: the undergraduate catalog does not specify the language

to be used in COP-3530 Data Structures and Algorithms. The change was implemented in Summer 2010. Subsequent assessments in Data Structures, Operating Systems, IAB, student exit interviews and focus groups have expressed their satisfaction with this change [Assessments]

# 2. One laboratory hour was added to CIS-3020 Introduction to CIS (now COP 3504 Advanced Programming Fundamentals for CISE Majors)

Data from assessments by course committees, beginning in 2007 [Assessments], suggested adding one laboratory hour to CIS-3020, which was renumbered and renamed as COP-3504 Programming Fundamentals for CISE majors in 2010. CIS-3020/COP-3504 is an intensive course for students entering the major with prior programming experience. Students with no prior programming experience are asked instead to take two courses, CIS-3022 and CIS-3022 (now COP 3502/3503 Programming for CISE Majors 1&2). The rationale for this change was to increase the amount of laboratory experience in COP-3504, to better match the laboratory experience provided by the two-course alternate sequence taken by students with no prior programming experience. This change was discussed and approved in our Curriculum Committee in January 2010 [Curriculum Committee-2010], and also discussed and approved in a CE faculty mini-retreat in March 20102010 [CE facultymini-retreat]. The change required no further approvals: the undergraduate catalog does not specify the number of laboratory hours in this course. The change was implemented in Summer 2010. Subsequent assessments in COP-3504, and our IAB have expressed their satisfaction with this change. It is noteworthy to point out that student exit interviews and focus groups did not raise this issue. In the 2009 Student Focus Group, students thought that less material is covered in CIS-3020 than in CIS-3022/3023, and that CIS-3020 was not ambitious enough. One year later, when asked about this (at that time) proposed change [Student Focus Group-2010], the consensus among the students was that it was not necessary.

#### 3. Group work forbidden in CIS-3020 (now COP-3405).

Informal feedback to the CISE Department Chair in 2008 revealed that allowing students to work in groups in CIS 3020 (now COP-3504) had allowed at least one student to pass the course with insufficient individual programming skills. Course Committee reports from CIS 3022/3023 (now COP 3502 / 3503) in Spring 2009 also recommended strictly individual programming projects <u>CIS-3022-Course-Committee-Spring-2009</u>]. Although this issue was not reflected in the achievement of the student outcomes, and students in this course are assumed to have had prior programming projects in CIS 3020 (now COP-3504). The change did not require consideration by the Curriculum Committee, nor a change to the program or the undergraduate catalog. It was implemented immediately, and no further such feedback has been received. In the student focus group of Spring 2009, one participant mentioned that less material was covered in CIS-3020 (now COP 3504) was not "ambitious enough". Other

participants disagreed. In the student focus group of Spring 2010 this issue did not come up. When asked whether the major emphasized individual programming skills enough, 80% of the participants either said yes, or had no opinion [Focus-group-2010].

#### 4. Java threading and Synchronization added to COP 4600 Operating Systems.

Beginning in 2007, informal discussions among faculty revealed a concern that multithreaded programming, specifically Java threading and synchronization, was not being covered in COP-4600 Operating Systems, although this knowledge is needed in the Networking course CEN4500C (now CNT4007C). The course committee report in Summer 2008 for COP-4600 mentions that this was a necessary change to the Operating Systems course [Course-Committee-COP-4600-Summer-2008]. The material has been discussed in COP 4600 since Fall 2009, and subsequent course committees have been satisfied with the results.

#### 5. MATLAB lab component added to EEL 3135.

In Spring 2010, the ECE Department decided to add a software (MATLAB) lab component to EEL 3135 Intro. Signals and Systems, making it EEL 3135C with 4 credit hours. The rationale is:

- Many students struggle with the abstract and mathematical material in EEL 3135, and consequently become frustrated about the class. Since EEL 3135 is the beginning class that introduces basic ECE concepts, such as frequency domain analysis and feedback, this frustration ripples through the remainder of our curriculum.
- Software labs provide hand-on and practical experiences to students by allowing them to "see, hear, and feel" the applications of the abstract material taught in class. This can motivate students to better understand and learn the material.
- The proposed labs are mainly MATLAB programming exercises with applications to Signals & Systems. They constitute a more formal avenue to train students about programming in MATLAB.
- Past EEL 3112 instructors do not think they need 4 credit hours to cover the material listed in the syllabus.

#### D. The Mock ABET Evaluation and Proposed Curriculum Reforms.

#### 1. Feedback from the 2011 Mock ABET visit

In 2011 the College of Engineering hired a consulting group to play the role of a visiting ABET evaluation team. Our entire draft ABET Self-Study report was submitted to this team, and a comprehensive, ABET-style visit took place. Our program evaluator was Dr. Nick Tredennick. Dr. Tredennick made the following recommendations:

#### **Criterion 2: Program Educational Objectives.**

From 2006 to 2011, our objectives remained unchanged, following a significant overhaul of the objectives in 2005. Throughout this period, the Objectives were discussed twice yearly in the Industrial Advisory Board meetings [IAB meetings]. In 2011, the mock ABET consulting team recommended that all programs in the College of Engineering revise their Objectives, with the goal of simplifying them. The Objectives were discussed in advance of the mock accreditation visit at the IAB meeting on October 6, 2011, specifically whether to revise and/or eliminate Objective 4, but no consensus was reached. The issue was discussed again at the IAB meeting on January 24, 2012. The IAB proposed specific changes in the wording, and the elimination of Objective 3 ("Be effective in multidisciplinary and diverse professional environments"). The issue was passed to the newly formed CEN Curriculum Committee, which decided to retain the wording changes, but not eliminate Objective 3. In addition, the committee proposed to change Objective 4 from "Provide leadership and demonstrate good citizenship", to "Provide leadership and demonstrate professional integrity". The Objectives Revision Proposal details the proposed changes. It was approved in the CEN Curriculum meeting on January 26, 2012, and approved unanimously by the entire CEN faculty [Objectives Revision Approval]. These changes to the Objectives required us to revise the questions in the Alumni Survey. The new Alumni Survey questions appear on the CEN website [New Alumni Survey].

#### **Criterion 3: Outcomes**

From 2006 to 2011, our outcomes (a) through (k) were essentially the same as the ABET (a) through (k), outcomes, but they were customized specifically for computer engineering, rather than engineering in general. We also had an additional outcome (l). The entire consulting team in 2011 recommended that all programs use the ABET (a) through (k) outcomes with no modifications or customizations. After consulting with our industrial advisory board [IAB-10-6-2011], and after a CEN Committee meeting [CEN-Committee-2-23-2010], we have adopted this change.

#### **Criterion 4: Continuous Improvement**

Our consultant (Dr. Tredennick), and the entire consulting team stated that we are performing our assessments too often, and in some cases in too many courses. This same concern was made regarding the entire College. They stated that the assessment burden on faculty is excessive and may not be sustainable. We are currently considering changing the frequency of the assessments, and performing assessments in fewer courses.

Tredennick stated that outcome (b), "an ability to design and conduct experiments, as well as to organize, analyze, and interpet data" was not adequately supported by our

assessment data. He found plenty of evidence that we assess students' ability to analyze experimental data, but not to design experiments. We have begun addressing this issue in COT 4501 Numerical Methods. In that course in Fall 2011, for example, students designed an experiment to evaluate the performance profile of  $x=A\b$  in MATLAB, for matrices of various sizes. Our assessments for that semester showed that students mastered this topic very well, with 81% of the students achieving an acceptable outcome, and an average Likert score of 3.7. [Assessments-COT-4501-Fall-2011-Outcome-b].

#### **Criterion 6: faculty.**

The mock ABET Evaluator expressed a concern regarding the joint CISE/ECE governance of the program, specifically the lack of a joint Curriculum Committee.

In the Fall of 2011, a Joint Computer Engineering Curriculum Committee was formed, with 3 faculty members from each of the two Departments. It was tasked with taking a broad and deep review of the entire Computer Engineering curriculum, and to propose changes to improve it. Dr. Herman Lam, ECE, was appointed Director of the Computer Engineering program, and chairs the Committee. The committee's findings and proposed changes to the curriculum appear in [Proposed-CE-Curriculum], and are summarized below. These changes are still pending as of June 2012, having been proposed to the Computer Engineering faculty on April 10, 2012 for their discussion and approval [Proposal to CE Faculty].

#### 2. Proposed Program Curriculum Reforms, 2011-2012.

The joint CE program Curriculum Committee determined that there is too much emphasis on an early distinction between the hardware (CEE) and software (CEN) tracks. Students must commit early to one track or the other. Once committed, they follow different study plans. The further down the track, the more difficult it is to change to the other track. This is illustrated by the difference between the two plans of study listed in Tables 5-1 and 5-2. The distinction between the tracks leads to advising issues, since there is limited advising on how to select a track. A student must select a track before significant advising can be done. Other differences in the two tracks include difference in computer programming requirements, the capstone senior design courses (one semester in CEN versus two semesters in CEE), and different GPA requirements. This makes it difficult for students to switch between tracks. Furthermore, while many changes and improvements have been made to the program (Criterion 4), the proposed changes discussed here reflect the most comprehensive examination and reform of the program since 1999.

#### Differences between the two existing tracks

Students in the software track (CEN) take the following required courses, which the hardware track does not take (they are electives for the hardware track):

- CNT 4007C Computer Network Fundamentals (formerly CEN 4500C)
- COT 4501 Numerical Analysis-A Computational Approach
- MAS 3114 Computational Linear Algebra

Students in the hardware track (CEE) take the following required courses, which the software track does not take (they are electives for the software track):

- EEL 3105 Analytical Methods in Electrical Engineering
- EEL 3112 Circuits 2
- EEL 3135 Introduction to Signals and Systems
- EEE 3396 Solid-State Electronic Devices

In addition, 12 of the 18 credits of technical electives in both tracks must be taken in the student's major department (CISE or ECE).

Students in ECE take a two-semester capstone senior design, whereas CISE students complete their senior design experience in one semester.

#### Guiding Principles for the proposed revision

The objective of this curricular revision process is to develop a joint CE curriculum for all Computer Engineering students, replacing the two distinct curricula for the two existing tracks. With a common core set of courses, and a set of electives organized around the concept of certificates. Four guiding principles were established for the examination of the curriculum:

- 1. **Computer Engineering core competency (breadth):** The core competency of the Computer Engineering major brings the unique value of integrated knowledge in both computer software and hardware (as opposed to Electrical Engineering or Computer Science majors).
- 2. Flexible specialization (depth): The student's choice of career path should be selected when appropriate, not necessarily early in the curriculum.
- 3. Explicit and clear guidance and focus: for students, advisors, and employers.
- 4. Additional goals: The changes must be implementable with no drastic changes to existing course offerings. Course changes have been proposed where they are deemed to be necessary, primarily in the capstone design course sequence, and in the introductory programming courses.

#### **Proposed Curriculum for the Joint Computer Engineering Program**

• There are 102 credits that are common to the two existing software and hardware tracks. This common core will be kept.

- An introductory programming course in Java will be added (COP 3502 Programming for CIS majors 1) for students with no prior programming experience. Students with sufficient prior Java programming experience will be able to obtain a course waiver. Typically, these are students who studied Java in Advanced Placement courses in high school, or learned on their own [Proposed programming requirements].
- COP 3503 (Programming for CISE majors 2) will become a C++-based course, not Java. This proposed change addresses feedback from our Industrial Advisory Board, which recommends that students be adept at C++. It should also address conerns about COP-3530 Data Structures and Algorithms, which is now taught using C++, and is considered to be very difficult for students with no prior experience in C++. These concerns have ben expressed by current and former students, in focus groups and exit surveys [Proposed programming requirements]
- The capstone senior design will become a two-semester sequence for all Computer Engineering students [Capstone course proposal]. Details are given below.
- The software and hardware tracks are to be eliminated. A number of 3-course certificates in various topics in Computer Engineering is proposed instead. All courses that were formerly required for one track but not the other will become electives for all students.
- Flexible specialization: the 18 credits of technical electives may be taken from either department. At most one programming language course can count towards the technical electives in the current curriculum; the new curriculum proposes no change to this constraint.
- Certificate options will be provided for explicit and clear guidance and focus when students are selecting courses to meet their 18 credit technical elective requirement. Each certificate will consist of at least three courses (typically 9 credits) so students can focus on two certificates. The certificates will be officially recognized on students' transcripts. The certifications are optional; a student may elect to take a wide range of technical electives that do not fulfill the requirements of any certificate. Sample certificates are listed below. Note that some of the courses in the certificates are required courses.

#### **Proposed Sample Certificate Options**

#### **Artificial Intelligence**

- CAP 4053 Artificial Intelligence for Computer Games
- CAP 4621 Artificial Intelligence and Heuristics
- CAP 4680 Knowledge-Based System: Theory and Practice

#### **Data Computer Communications & Networking**

• EEL 4713 or CDA 4102 Computer Architecture

- CNT 4007C Computer Network Fundamentals
- EEL 4598 Data Computer Communications

#### **Database Systems**

- COP 3530 Data Structures and Algorithms
- CIS 4301 Information and Database Systems 1
- CIS 4720 Information and Database Systems 2

#### Modeling and Interaction

- CAP 4800 Systems Simulation
- CAP 4730 Computational Structures in Computer Graphics
- CIS 4930 Human-Computer Interaction (currently a special topic course)

#### **Interaction Programming for Industrial Systems and Operations**

- COT 4501 Numerical Methods
- ESI 4312 Operations Research
- CAP 4680 Knowledge-Based System: Theory and Practice

#### **Optical Networks**

- EEE 3396 Solid-State Electronic Devices
- EEL 4440 Optical Communication Systems
- EEL 4598 Data Computer Communications

#### **Reconfigurable Computing**

- EEL 4712 Digital Design
- EEL 4713 Digital Computer Architecture
- EEL 4930 Reconfigurable Computing

#### **Robotics**

- EEL 4744 Microprocessor Applications
- EEL 4665 Intelligent Machines Design Laboratory
- CAP 4621 Artificial Intelligence and Heuristics

#### Sensor Networks

- ABE 4304 Remote Sensing in Engineering
- EEL 4598 Intelligent Machines Design Laboratory
- Remaining course to be determined

#### Software System Development

- CEN 3031 Introduction to Software Engineering
- CEN 4072 Software Testing and Verification
- Remaining course to be determined

#### VLSI

• EEE 3396 Solid-State Electronic Devices

- EEE 3308C Electronic Circuits 1
- EEE 4331 Microelectronic Fabrication Technologies

#### **Computational Science**

- COT 4501 Numerical Methods
- CIS 4930 Sparse Matrix Algorithms
- CAP 4800 Systems Simulation

#### **Proposed Computer Engineering Capstone Sequence**

A sub-committee of the Computer Engineering Curriculum Committee was formed to examine the Computer Engineering capstone course sequence. Discussion notes of this sub-committee appear in [Capstone Course Discussion Notes]. The capstone course sequence is proposed to become a two-semester sequence for all students in the program. The first course will provide the training and integration of skills necessary for successful completion of the second course. The project itself will be carried out during the second course. It can range from one extreme (all software) to the other (all hardware) or any mixture of the two.

The first course in the sequence will be taught in two different sections. One of them will be a general design course that will prepare the student for either a software or hardware project. The CISE department will offer this section. The second section will be for students (typically in ECE) who plan to perform a project with a heavy hardware emphasis. The ECE department will offer this second section.

The second semester will also be done in two different sections: one for a software emphasis and to be offered by the CISE department, and one for a hardware emphasis to be offered by the ECE department. In this second design course, students will be required to use knowledge from multiple previous courses. It will be a team project, with an external advisor (a faculty member in any department, or an industrial advisor). An oral presentation and final written report will be required. The complete proposal appears in the CE website, at <u>Capstone course proposal</u>.

#### Timeline

The joint CISE/ECE Curriculum Committee met regularly over the 2011-2012 academic year and proposed these draft revisions to the program on April 10, 2012. The revisions are currently under discussion by the Computer Engineering faculty, and will likely undergo some changes before being formally voted on. We include these proposed changes to the program in this ABET Self-Study report to document our ongoing improvements to the program.

Documentation of these proposed changes is provided on the CE program website, including [CEN committee minutes] and the slides presented to the CE faculty on April 10, 2012 [Proposal to CE Faculty].

### **CRITERION 5. CURRICULUM**

#### A. Program Curriculum

#### A.1. Plan of Study

Table 5-1 shows the Plan of Study for the software track of the Computer Engineering program. Table 5-2 shows the Study Plan for the Hardware track. The University of Florida operates on a semester system. The academic year begins and ends in August. There are two semesters averaging 15 weeks of instruction, plus a week of final examinations and two six-week summer terms. Semesters begin in August, January, and May, with summer term offered as a whole as Term C, or in two half-terms, with Term A beginning in May and Term B beginning in June.

#### A.2. Curriculum alignment with program educational objectives

Students graduating with the Bachelor of Science in Computer Engineering degree are prepared for engineering practice. Referring to Table 5-1 *Basic-Level Curriculum*, the curriculum requires in excess of one year a combination of college level mathematics and basic sciences. Required laboratories for chemistry and physics courses ensure experimental experience for every student in the program. The basic science courses are followed by engineering science courses, and courses in Computer Science and Electrical Engineering. The general education component consisting of a minimum of 18 semester hours of humanities, social science, and technical writing assures the student has achieved a well-rounded education. Exposure to aspects of engineering professionalism and ethics assures the student has been introduced to contemporary engineering issues. All these factors contribute to the achievement of Program Objective 1, to excel in a career utilizing their education in Computer Engineering, and to Program Objective 2, to continue to enhance their knowledge.

In the general education courses, students gain fresh perspectives, methods and tools for understanding the traditional and the newly discovered knowledge. The Composition courses equip students with the skills necessary to complete successfully the reading and writing requirements of their discipline. The Mathematical Sciences courses help students acquire concepts and skills in logic, inductive and deductive reasoning, and abstract and quantitative thinking. The Humanities courses enable students to think critically about what artists and thinkers (past and present) have to teach us about the non-material qualities of human beings and human values. The Social and Behavioral Sciences courses enable students to investigate human behavior in its social context. The Physical and Biological Science courses introduce students to the basic concepts of science and the scientific method and enhance awareness of scientific developments and their impact on society and the environment. All these factors contribute to the achievement of Program Objective 3, to be effective in multidisciplinary and diverse professional environments, and to Objective 4, to provide leadership and demonstrate professional integrity.

#### A.3. Pre-requisite structure support for outcomes attainment.

Students gain a solid foundation in mathematics and sciences before embarking in the Computer Engineering area. They are required to take a minimum of 39 hours (CEN, 42 hours in CEE) and in mathematics, statistics, and basic sciences. This includes 4 semesters of calculus and differential equations, as well as 4 semesters (with lab) of physics, chemistry, and biology. Computational linear algebra, discrete mathematics, engineering statistics, and numerical analysis are also required, as is professional communications. These courses give them the fundamental science and the mathematical tools to design and to analyze designs effectively.

General concepts in the introductory CIS course (COP 3504, formerly CIS 3020), logic, discrete mathematics, data structures and algorithms prepare students for advanced software work. Work in these courses is generally at the individual level to ensure that all students are prepared for later assignments. There is small scale design in the introductory course, but design starts to play a major role in Data Structures and Algorithms. In this course, software components are built and modified. Typical components include linked lists, queues, search trees, hash tables, various graph and tabular structures, etc. Figure 5-1 below shows the required courses with significant design component.



Design in Computer Engineering Program

Figure 5-1 – Prerequisites and Design in Computer Engineering Program

In parallel, students learn basic Electrical Engineering concepts and practice in circuits, solid-state electronics (though this is optional for the software track, most software track students still take it to fulfill engineering breadth requirements), and Signals and Systems. These courses have some design component, but design becomes a major emphasis in Digital Logic and Computer Systems, and in Digital Design. In these courses, logic circuits are built from the basic elements to large-scale integration. In Digital Logic and Computer Systems, the hardware and firmware for a complete computer system are built. This avenue culminates in the microprocessors course, in which applications for microprocessor systems are built using additional hardware as needed and programming a microprocessor in assembly language.

COP 3504 (Adv. Programing Fundamentals) is a prerequisite for several of the advanced digital design courses. The Computer Organization, Digital Logic and Computer Systems, and Microprocessor Applications courses act as bridges between the CEE side and the CEN side of the program, and relate machine instructions to programming languages and higher constructs. While in the Microprocessor Applications course, a computer is programmed in assembly language, a high level programming language (for the most part) is used to modify and extend an operating system in the Operating Systems class. In addition to putting together hardware and software in Operating Systems, algorithms, data structures, and analysis play a large role.

In both Software Engineering and Operating Systems, large software systems are designed, built, and maintained. In Operating Systems, students must design and implement a system call, then integrate it with a real operating system. They then must redesign and integrate various other components, such as device drivers, memory management routines, and file system components. In Software Engineering, teams design and built a large software project over the course of the semester. Though the nature of the projects may vary, it is a significant undertaking that requires a sustained team effort. For example, a recent project had teams build a movie rental management system. This project had two versions, with refactoring between versions. Students were required to estimate effort and log actual effort needed for each task. Other recent projects include games developed under the Android operating system to run on cell phones, software packages to visualize the behavior of algorithms, and social networking applications. All projects in Software Engineering require students to work in multi-disciplinary groups, in sub-groups that design and implement user interfaces, communications, artificial intelligence (in games), and graphics.

Software track students are required to take Computer Network Fundamentals and Numeric Methods. Design of network protocols and distributed applications is a major emphasis of the former course, while design and analysis of numeric algorithms is emphasized in the latter.

Two semesters of other engineering core courses round out the fixed course requirements. Several elective courses are also available to provide particular concentration in the areas of electronics, communications, databases, software engineering, artificial intelligence, etc. Many of these courses have significant design components, but we do not count on them to provide the necessary design experience.

Team concepts are taught and team work is required in Software Engineering, as is resource estimation. Students also are required to communicate orally and in writing throughout that course and in the capstone course. The course in legal and social issues addresses societal context, ethics, contemporary issues, and the need for lifelong learning directly, though these are also addressed throughout the curriculum.

Many of the courses have strong engineering design compenents, reflected in both paper designs required in homeworks and examinations, as well as the implementations required in projects. Required courses with particularly strong design components include:

- COP 3530 Data Structures and Algorithms (both CEN and CEE): Students are required to design and implement or to augment existing data structures, and to analyze their performance. Functional and performance characteristics are the driving requirements.
- **CEN 3031 Software Engineering (both):** Students work in teams to create specifications and then design software that meets those specs. They also design test mechanisms to ensure their software is robust.
- **COT 4501 Numerical Methods (CEN):** CISE tudents are required to design and analyze numerical algorithms for performance and for error propagation.
- EEL 3112C Circuits 2 (CEE) and EEL 4712C Digital Design (both): Students design and implement electrical and logical circuits and components as specified.
- EEL 4744C Microprocessor Applications (both): Students design, build, and program whole computers from components. Computer design also takes place in CDA 3101 Computer Organization.
- **COP 4600 Operating Systems (both):** Students have several projects in which they enhance an existing operating system to meet a requirement, then verify their modifications.
- **CNT 4007C Computer Network Fundamentals (CISE):** Requires students to develop code that satisfies the requirements for distributed applications or network management as required.
- CIS 4914 Senior Design (CEN) or EEL 3923C / EEL 4924 Senior Design (CEE): The capstone course (in either option) has design as its primary focus. Here, the student must obtain requirements from the sponsor, create and execute the design, and document both the process and the product. Alternatively, students can take the CIS / EEL 4912C / 4913C sequence of Integrated Product and Process Design, in which students interact closely with an industrial partner to create a design that meets a specific need.

In addition, most of the elective courses have a significant design component.







#### A.4. Program prerequisite structure.

Figure 5-2 shows the prerequisite structure of the Computer Engineering program. Common courses to both tracks are shown in the middle, ECE courses on the left, and CISE courses on the right.

#### A.5. Hours and depth of study requirements.

Referring to Tables 5-1 and 5-2, the minimum ABET requirements for credit hours in basic math and science is 32. The software track exceeds this minimum with 39 hours, and the Hardware track exceeds it with 42 hours. The minimum requirement for credit hours in design is 48. The software track exceeds this with 69 hours, and the Hardware track exceeds it with 65 hours. Percentage-wise, the minimum ABET requirement for math and science is 25%, and in design it is 37.5%. The software track exceeds these with 31% and 55%, and the Hardware track exceeds these with 31% and 51.5%, respectively.

#### A.6. Major design experience

Students have two options for the capstone design experience. They may take the traditional, one semester Senior Project class (CEN students), or the two-semester Senior Design sequence (CEE students). Alternatively, they may apply for the selective and limited two-semester IPPD program.

In the traditional Senior Project class students work either individually or on a small team (2-3 students, usually all in the Computer Engineering or Electrical Engineering program) on a project that allows them to make use of the skills and knowledge they have acquired over the course of the program. This is done under the supervision of a faculty member from either the CISE or the ECE department. All students in the Senior Project course meet regularly with the course supervisor, and they make presentations on their progress, ending with a Senior Project presentation to the group. A specific form for evaluating outcomes in Senior Design is filled out and signed by the project advisor. [Senior Project Advisor Form]

Alternatively, students in either track may apply for the Integrated Product and Process Design [IPPD] program, which entails a two-semester commitment under the supervision of a faculty member, usually working on a project for an external institution or corporation that sponsors the project. IPPD requires two semesters, with the second semester counting in the curriculum as a technical elective. Here, an organization (the external sponsor) sets a goal, and the team of students and their faculty coach go through the engineering and business processes needed to achieve that goal. These include requirements specification, business plan, technology planning, system design and specification, test planning, etc.

Typically the interaction with the organizational liaison is high, but the student team is given a fair amount of leeway in solving the problems with which they are tasked. Visits to the organization's site are arranged, and all teams give a program-wide presentation at the end of each semester. During the course of the terms, teams of coaches review each student teams' progress and plans. The first term involves regular lectures on engineering development processes in addition to learning about team concepts and the team-specific tasks. Several deliverables are required during the course of the term, culminating in the Preliminary System Level Design Document that is presented at the end of the first term. The second term usually involves implementation of that design, along with testing and a few presentations for tracking purposes. It culminates in final demonstration and delivery along with 20-minute talks and poster sessions, in a formal, conference-style setting attended by representatives of the external organizations. A specific Outcomes Evaluation form is filled out for each IPPD team [IPPD Outcomes Evaluation Form]

In both the regular senior project and in the IPPD option, the student is obligated to meet the requirements of the project as specified by the project "customer." This may be the supervising faculty, or it may be a sponsor from outside the department. The student is required to document these, and to obtain the written agreement of the customer before implementing the project. Student and customer communicate and negotiate to determine standards and realistic constraints, compliance with which is assessed in Outcome (c).

#### A.7. Cooperative education.

#### **CISE Department Co-Op program**

The CISE Department offers students an opportunity to integrate classroom instruction with practical work experience. The Co-op/Internship program gives students the opportunity to verify academic and vocational interests, gain valuable experience in the chosen field prior to graduation, and earn income that can be used to defray college expenses. The work experience is conducted under approved industrial, business, institutional, or governmental agency supervision.

CIS 4940, Practical Work (Internship) is a one credit course that may be applied toward the technical electives requirement for CISE undergraduate degree programs. Students may register for CIS 4940 a maximum of three times for a total of three credits. It may only be taken S/U (Satisfactory/Unsatisfactory). Registration for the course is handled through CISE Student Services.

To register for Practical Work (Internship), a formal letter from the sponsoring company describing the nature of the internship must be on file in Student Services before the end of the registration drop/add period. The letter must indicate that the student will be working approximately 40 hours a week over the term of the semester (approximately 600 hours total) and that the internship is Computer Science/Engineering related, provide a description of the student's responsibilities, and provide detailed contact information of the person or persons who will be supervising the student during the internship.

To successfully complete Practical Work (Internship) with a grade of Satisfactory, a 2-4 page Post-Internship Report written by the student, and a formal Evaluation Letter written by the student's supervisor(s) is due in the CISE Student Services office one week prior to the end of finals week. The Evaluation Letter must include a review of the student's work during the internship, an evaluation by the student's supervisor(s) indicating whether or not the student has satisfactorily completed the internship, and detailed contact information of the person or persons who have supervised and evaluated the student's performance.

CIS 4949 Co-op is a one-credit course that may be applied toward the technical electives requirement for CISE undergraduate degree programs. Students may register for CIS 4949 a maximum of three times for a total of three credits. It may only be taken S/U (Satisfactory/Unsatisfactory). The Co-op can either be taken as an Alternating Co-op in which a student works full-time in non-consecutive semesters with a company while only registering for CIS 4949 or as a Parallel Co-op in which a student works part-time for consecutive semesters with a company while enrolled as a full-time student at UF. Registration for the course is handled through CISE Student Services. Co-op students are also asked to meet with an advisor at the Career Resource Center before the Co-op begins. The Career Resource Center [CRC] will keep a file on the students Co-op experience.

To register for a Co-op a formal letter from the sponsoring company describing the nature of the Co-op must be on file in Student Services before the end of the registration drop/add period. In the case of an Alternating Co-op, the letter must indicate that the student will be working approximately 40 hours a week over the term of the semester (approximately 600 hours total). In the case of a Parallel Co-op, the letter must indicate that the student will be working approximately 20 hours a week over the term of the semester (approximately 300 hours total). The letter must also indicate that the internship is Computer Science/Engineering related, provide a description of the student's responsibilities, and provide detailed contact information of the person or persons who will be supervising the student during the internship.

To successfully complete the Co-op with a grade of Satisfactory, a 2-4 page Post-Internship Report written by the student, and a formal Evaluation Letter written by the student's supervisor(s) is due in the CISE Student Services office within one week prior to the end of finals week. The Evaluation Letter must include a review of the student's work during the internship, an evaluation by the student's supervisor(s) indicating whether or not the student has satisfactorily completed the internship, and detailed contact information of the person or persons who have supervised and evaluated the student's performance.

#### **ECE Department Co-OP program**

The ECE Department's Cooperative Education Program (Co-Op) offers students an opportunity to integrate classroom instruction with practical work experience. The program gives students the opportunity to verify academic and vocational interests, gain valuable experience in the chosen field prior to graduation and earn income that can be used to defray college expenses. The job assignment must be related to Electrical Engineering design. Job assignments such as technician, data entry operator, and clerical are not acceptable. Students wishing to participate in the Co-Op Program must have completed their freshman year (30 semester hours) and have a grade point average of 2.00 or higher. The ECE Department prefers that students wait until they have completed some of the major Electrical and Computer Engineering courses before participating in co-ops or internships. Students are expected to engage in work experiences that are relevant to their professional discipline and increasingly challenging in each successive term.

The ECE Department's Co-Op Program has three plans. The first plan is "alternating". The student alternates between a full-time academic schedule one term and full-time work assignment the following term for a minimum of two work semesters. The second plan is "consecutive", where the student works two consecutive terms. The third plan is "parallel". The student, while carrying academic course work, is also employed in an appropriate work assignment. In either work plan, the student registers for the Co-Op course number EEL 4949. This course only carries the grade option of Satisfactory/Unsatisfactory. The Department does not allow EE students to receive credit towards the degree for the "parallel" assignment. The Department does not believe that an EE student can receive the full benefit of the full-time Co-Op experience while only working part-time.

For students who do not wish to participate in the Co-Op Program, ECE offers students a one-term practical work experience called Internship. Students on an Internship are treated the same as Co-Op students. In order to receive technical elective credit, the job assignment must be related to Electrical Engineering and follow the same guidelines and procedures as the Co-Op Program. Students register for 1 credit of EEL 4948, which carries the grade option of Satisfactory/Unsatisfactory.

#### A.8. Course materials.

Course materials (syllabi, assessments, course outcome reports, course committee reports, sample student work) appear on the ABET CEN program website [Assessments]. Student sample work for each course, for each semester, appears in the same directory as the assessments of outcomes in that course. Copies of textbooks will be available during the evaluator visit.

#### B. Course Syllabi

Course Syllabi appear in Appendices A1 and A2.

#### Table 5-1 Curriculum (Software Track)

(Computer Engineering, Software track)

		Cu	Curricular Area (Credit Hours)				
Course (Department, Number, Title) List all courses in the program by term starting with first term of first year and ending with the last term of the final year.	Indicate Whether Course is Required, Elective or a Selected Elective by an R, an E or an SE. <sup>2</sup>	Math & Basic Sciences	Engineering Topics Check if Contains Significant Design (√)	General Education	Other	Last Two Terms the Course was Offered: Year and, Semester, or Quarter	Average Section Enrollment for the Last Two Terms the Course was Offered <sup>1</sup>
Year 1 – Fall							
MAC 2311—Calculus 1	R	4		1		F2011, S2012	30
CHM 2045—General Chemistry	SE	3		1		F2011, S2012	35
CHM 2045L—Lab	R	1		1		F2011, S2012	60
General Education Distribution	SE			3			
General Education Distribution	SE			3			
Year 1 - Spring		<u> </u> !		·!			
MAC 2312—Calculus 2	R	4		1		F2011, S2012	26
PHY 2048—Physics w/Calculus 1	R	3		I		F2011, S2012	30
PHY 2048L—Lab	R	1		1		F2011, S2012	18
COP 3504—Advanced Prog for CIS Majors	SE		3	1		F2011, S2012	12
CHM 2046 or Bio—Chemistry 2 OR a biological science	SE	3					30
Year 1 - Summer		!		·'	<u> </u>		
General Education Distribution	SE			3			
PHY 2049—Physics w/Calculus 2	R	3		1		F2011, S2012	29
PHY 2049L—Lab	R	1		1	[	F2011, S2012	17

Year 2 – Fall						
MAC 2313—Calculus 3	R	4			F2011, S2012	30
ENC 3254—Professional Communications for Engineers	R			3	F2011, S2012	19
COT 3100—Applications of Discrete Structures	R		3		F2011, S2012	47
EEL 3701C—Digital Logic and Computer Systems	R		4		F2011, S2012	8
Year 2 – Spring		+	+	+		+
MAP 2302—Differential Equations	R	3			F2011, S2012	30
CDA 3101 Introduction to Computer Organization	R		3		F2011, S2012	27
COP 3530—Data Structures and Algorithms	R		4 (√)		F2011, S2012	50
EEL 3111C—Circuits 1	R		4	<u> </u>	F2011, S2012	10
Year 2 - Summer			<u> </u>	+		
General Education Distribution	SE			3		+
General Education Distribution	SE			3		+
EEL 3135—Signals and Systems OR EEE 3308C—Elec. Circuits1	SE		3		F2011, S2012	68
Year 3 – Fall	+	+	+	+		+
EEL 4712C—Digital Design	R		4 (1)		F2011, S2012	12
Engineering Core Course	SE		2-3			
MAS 3114—Computational Linear Algebra	SE	3			F2011, S2012	60
STA 3032 Engineering Statistics	R	3	+	+	F2011, S2012	130
Year 3 – Spring		+	+	+		
EEL 4744C—Microprocessor Applications	R		4 (1)		F2011, S2012	9
COT 4501 or MAD 4401—Numerical Analysis	SE	3			F2011, S2012	36
Engineering Core Course	SE		2-3			
Major Technical Elective (2 courses)	SE		6			-

Year 3 – Summer							
Co-op or Internship, if desired							
Year 4 – Fall							
COP 4600—Operating Systems	R		3 (√)			F2011, S2012	24
CEN 3031—Introduction to Software Engineering	R		3 (√)			F2011, S2012	8
Major Technical Elective (2 courses)	SE		6				
Year 4 – Spring							
CNT 4007C—Computer Networking Fundamentals	R		4 (√)			F2011, S2012	32
CEN 4914—Senior Project	R	R		3 (1)		F2011, S2012	16
EGN 4034—Professional Issues in Enginee	ring SE		1			F2011, S2012	107
Major Technical Elective (2 courses)	SE		6				
Add rows as needed to show all courses	in the curriculum.						
TOTALS-ABET BASIC-LEVEL REQUIREMENTS			39	69	18		
OVERALL TOTAL CREDIT HOURS FOR THE DEGREE 126							
PERCENT OF TOTAL			31	55	14		
Total must satisfy Minimum Semester Credit Ho	nust fy Minimum Semester Credit Hours			48 Hours			
her credit nours or Minimum Percentage ercentage			25%	37.5 %			

1. For courses that include multiple elements (lecture, laboratory, recitation, etc.), indicate the average enrollment in each element.

2. Required courses are required of all students in the program, elective courses are optional for students, and selected electives are courses where students must take one or more courses from a specified group.

Instructional materials and student work verifying compliance with ABET criteria for the categories indicated above will be required during the campus visit

#### Table 5-2 Curriculum (Hardware Track)

#### (Computer Engineering, Hardware track)

		Curricular Area (Credit Hours)					
Course (Department, Number, Title) List all courses in the program by term starting with first term of first year and ending with the last term of the final year.	Indicate Whether Course is Required, Elective or a Selected Elective by an R, an E or an SE. <sup>2</sup>	Math & Basic Sciences	Engineering Topics Check if Contains Significant Design (√)	General Education	Other	Last Two Terms the Course was Offered: Year and, Semester, or Quarter	Average Section Enrollment for the Last Two Terms the Course was Offered <sup>1</sup>
Year 1 – Fall							
MAC 2311—Calculus 1	R	4				F2011, S2012	30
CHM 2045—General Chemistry	SE	3	1			F2011, S2012	35
CHM 2045L—Lab	R	1	1			F2011, S2012	60
General Education Distribution	SE	1	1	3			
General Education Distribution	SE	<u> </u>		3			
Year 1 - Spring	<u> </u>						
MAC 2312—Calculus 2	R	4	1			F2011, S2012	26
PHY 2048—Physics w/Calculus 1	R	3	1			F2011, S2012	30
PHY 2048L—Lab	R	1	1			F2011, S2012	18
ENC 3254—Professional Communications for Engineers	R			3		F2011, S2012	19
CHM 2046 or Bio—Chemistry 2 OR a biological science	SE	3					30
Year 2 – Fall							
MAC 2313—Calculus 3	R	4				F2011, S2012	30
COP 3504—Advanced Prog for CIS Majors	SE		3			F2011, S2012	12
PHY 2049—Physics w/Calculus 2	R	3				F2011, S2012	29
PHY 2049L—Lab	R	1	Γ			F2011, S2012	17
General Education Distribution	SE			3			

Year 2 – Spring						
MAP 2302—Differential Equations	R	3			F2011, S2012	30
COT 3100—Applications of Discrete Structures	R		3		F2011, S2012	47
EEL 3105—Analytical Methods in Electrical Engineering	R	3			F2011, S2012	101
EEL 3111C—Circuits 1	R		4		F2011, S2012	10
Veen 2 Fall						
					E2011 02012	10
EEE 3308C Electronic Circuits 1	R		4 (\v)		F2011, S2012	10
EEL 3396 Solid State Devices	R	3			F2011, S2012	77
EEL 3135—Signals and Systems	R	3			F2011, S2012	68
EEL 3701C—Digital Logic and Computer Systems	R		4		F2011, S2012	8
Year 3 – Spring						
CDA 3101 Introduction to Computer Organization	R		3		F2011, S2012	27
COP 3530—Data Structures and Algorithms	R		4 (1)		F2011, S2012	50
EEL 3112 Circuits, Systems, and Signals	R		3		F2011, S2012	63
General Education Distribution	SE			3		
Veer 2 Summer	+					
Co-op or internship, if desired	+					_
Year 4 – Fall						
EEL 4744C—Microprocessor Applications	R		4 (1)		F2011, S2012	9
STA 3032 Engineering Statistics	R	3			F2011, S2012	130
Electrical Eng. technical elective (any EEE/EEL except EEL3003)	SE		3			
General Education Distribution	SE			3		

Year 4 – Sprin	g						
COP 4600—Operating Systems R		R		3 (1)		F2011, S2012	24
CEN 3031—Introduction to Software Engineering R		R		3 (1)		F2011, S2012	8
EEL 3923C Ele	ectrical and Computer Engineering Design 1	R		3 (1)		F2011, S2012	48
EGN 4034—Pr	ofessional Issues in Engineering	R		1		F2011, S2012	107
College breadth elective, from approved list		SE		2			
Year 5 – Fall							
EEL 4712C—E Architecture	Digital Design or EEL 4713C Digital Comp.	SE		4 (√)		F2011, S2012	12
Electrical Eng. technical electives (any EEE/EEL except EEL3003)		SE		6			
Technical Elect	ive, from approved list	SE		3			
Year 5 – Sprin	g						
EEE 4924 Senior Design		R		3 (1)		F2011, S2012	51
Technical Elective, from approved list SE		SE		2			
Add rows as ne	eded to show all courses in the curriculum.						
TOTALS-ABET BASIC-LEVEL REQUIREMENTS			42	65	18		
OVERALL TOTAL CREDIT HOURS FOR THE DEGREE 126							
PERCENT OF TOTAL			33	51.5	14		
Total must satisfy either	Total must satisfy either Minimum Semester Credit Hours		32 Hours	48 Hours			
credit hours or percentage	lit hours or rcentage Minimum Percentage		25%	37.5 %			

- 1. For courses that with multiple elements (lecture, laboratory, recitation, etc.), the average enrollment in each element is indicated.
- 2. Required courses are required of all students in the program, elective courses are optional for students, and selected electives are courses where students must take one or more courses from a specified group.

Instructional materials and student work verifying compliance with ABET criteria for the categories indicated above will be required during the campus visit

## **CRITERION 6. FACULTY**

#### A. Faculty Qualifications

The faculty is well educated and prepared for their educational and research missions. All tenure-track faculty have doctoral degrees, as do most of our instructors. The rest of our instructors hold at least Masters degrees. The faculty adequately covers all areas of the curriculum. The faculty are extremely well qualified, productive, and nationally and internationally recognized. Faculty Vitaes appear in Appendices B1 and B2. The faculty qualifications appear in Tables 6-1a (CISE Department) and 6-1b (ECE Department).

The faculty span the spectrum of Computer Engineering, from specialists in theoretical Computer Science in CISE, to hardware specialists in ECE. In CISE, 15 faculty teach and do research in theoretical Computer Science areas, 21 other work in the area of computer systems, and 22 mainly focus on applications. In ECE, there are 38 full-time or tenure accruing faculty and 3 full time lecturers

Many faculty bridge two or more areas, and several instructors primarily teach service courses. Many have industrial experience, and many have on-going consulting activities (Davis is the author of x=A) in MATLAB when A is sparse, for example). Their education and experience allow the faculty to provide students with meaningful examples relating conceptual material in the class to real-life applications. All faculty members are very active in research and professional activities. Several are editors of prestigious journals. Most participate in conference program committees and other conference activities. Many have served on NSF panels, and a few have served as program directors in the NSF (Chen, Chow). A few hold degrees in other areas related to their research However, as is typical for Computer Engineering faculty, few are registered as professional engineers. Many professors have industrial experience and continuing industrial relationships. A few have their own companies, and regularly consult for industry. In addition, IPPD coaches and the numerous professors with industrial research contracts and grants have frequent contact with industry and real-life engineering issues. Many have long-standing industrial relationships with companies such as Lockheed-Martin, Cisco, Intel, and Raytheon). Our semi-annual Industrial Advisory Board meetings provide further opportunities for industrial interactions.

The faculty members are extremely well qualified, productive, and nationally and internationally recognized. They publish hundreds of journal and conference proceedings papers annually.

#### **B.** Faculty Workload

Given the diversity of the Computer Engineering faculty, there are a variety of teaching assignments. The system is designed to be flexible, accommodating a wide range of individual interests and skills, while maintaining accountability and a reasonable level of equity. Faculty teaching load is determined by examining the level of research activity to try and maintain fairness in workload assignments. Faculty in both Departments are assigned between 2 and 5 courses in the nine month academic year. Courses are assigned collegially. In the CISE Department, courses are assigned to faculty through interaction with the Associate Chair. The ECE Department has five divisions and courses are assigned to a division, sometimes more than one division. Faculty in the division hold a meeting to determine individual course assignments. The associate chair coordinates these requests for assignment and any problems and gaps are identified. These are usually solved with faculty input and minimal effort.

Tables 6-2a (CISE Department) and 6-2b (ECE Department), Faculty Workload Summary, describe the faculty workload.

#### C. Faculty Size

With 73 tenured or tenure-track faculty (35 in CISE, 41 in ECE), the number of faculty is more than adequate to teach the courses in the program. Each department has a professional advising staff; CISE has a Student Services Center with two full-time undergraduate advisors and two support staff for them, while ECE has the Undergraduate Services Office. These shoulder the primary advising burden for undergraduates, providing tutoring, and interfacing with the Career Resource Center. This approach provides consistent advising for the undergraduates, and allows faculty to concentrate their interactions in curricular matters and life advice, rather than on the more mechanical aspects of program compliance. In each Department, the departmental governance positions are adequately staffed, as are the college-level positions. In addition, each department contributes their expertise to the university senate and to other College and University-level bodies. As a faculty, we supervise the ACM programming team, the student chapters of the ACM and the IEEE, and have been advisors to many undergraduate organizations (Theta Tau, Alpha Phi Omega, Aikido Club to name a few). In addition, several faculty members have served as minority mentors and adiysors to minority student organizations, have hosted minority undergraduates for a summer research experience, have hosted high school teachers and high school students for summer internships, etc. Beyond the classroom and the laboratory, students have extended contact with professors through the IPPD program, ACM programming team, IEEE CS and ACM supervision, etc. All faculty are required to keep regular, posted office hours, and routinely meet students outside these times as needed.

The CISE Department has added four faculty in the 2007-2011 period: Drs. Alireza Entezari, Ahmed Helmy, Rong Zhang, and Daisy Wang. The ECE Department has added ten new faculty since the last ABET visit in 2006. They are Drs. Ann Gordon-

Ross, Greg Stitt, Qun Jane Gu, Xiaolin Andy Li, Nima Maghari, Kamran Mohseni (dual appointment with Mechanical and Aerospace Engineering), Robert Moore, Sean Meyn, Allen Turner, and Y. K. Yoon.

The majority of the faculty are considered career advisors. Students are encouraged to speak with the faculty concerning their career goals and objectives. Faculty also serve as advisors to student groups and as advisors to students engaged in departmental high honors theses. All faculty are encouraged to engage in their own professional development. Interactions with industry are encouraged and are accomplished through sponsored and unsponsored research as well as student design projects. Several faculty serve as mentors in the IPPD program.

All faculty serve on departmental, college, and university committees to ensure effective communication and efficient operation and delivery of our program. Many faculty serve as industry consultants or, in some cases, engage in entrepreneurial endeavors that enhance the prestige of the university as well as providing the students with inspiration and an enhanced educational perspectives and opportunities.

#### **D.** Professional Development

Faculty members are very active in research and professional activities. Several are editors of prestigious journals. Most participate in conference program committees and other conference activities. Many have served on NSF panels and a few have served as program directors in the NSF (Chen, Chow). A few hold degrees in other areas related to their research. However, as is typical for Computer Engineering faculty, very few are registered as professional engineers.

Professional development opportunities for faculty fall into two categories; research and education. From the research perspective, most faculty routinely attend professional conferences where they are authors, session chairs, program committee members and chairs, and conference chairs. This aspect of professional development for faculty provides prestige for the university and ensures that the faculty is on the cutting-edge of the latest developments in their fields. This is turn helps to eliminate legacy material from coursework as well as allowing faculty to share with their students the latest trends and developments in the courses they teach. Faculty are also eligible for sabbaticals every six years. Many professors have industrial experience and continuing industrial relationships. A few have their own companies, and several regularly consult for industry. In addition, IPPD coaches and the numerous professors with industrial research contracts and grants have frequent contact with industry and real-life engineering issues. Many have long-standing industrial relationships. Our semi-annual Industrial Advisory Board meetings provide further opportunity for industrial interactions.

The university also provides numerous opportunities for faculty to enhance our skills as engineering educators. This includes university and college-level workshops on effective teaching skills. Both the university and the college have a guest lecture program where
innovators in engineering education from around the country are invited to speak on issues and methods of interest to engineering educators.

Both Departments, as well as the College of Engineering both routinely support travel expenses for faculty to attend workshops in teaching excellence such as those given by the American Society for Engineering Education (ASEE).

Sabbaticals are awarded by the University, via recommendation by the College. Faculty are eligible for a sabbatical after six years of service. Traditionally, there have been two types of sabbaticals: one semester with full-pay, or two-semesters with half-pay. Recently, UF added a new type of sabbatical, with full pay for two semesters. UF has committed to awarding a minimum of 50 such sabbaticals per year. Sabbatical policies are listed on UF's Academic Personnel website [UF-sabbaticals]. In addition, UF offers the Faculty Enhancement Opportunity (FEO) program, with monetary awards for creative and flexible faculty development projects, including educational experiences and/or conferences, work with consultants/experts, and release time for intensive writng or creative work. The FEO program is administered by the Provost's office [FEO].

#### E. Authority and Responsibility of Faculty

Input from the faculty concerning the guidance of the program is mainly received through regular faculty meetings. In addition faculty are encouraged to contact the Department Chair, Associate Chair, or Undergraduate Coordinator with any observations or concerns they may have. The faculty also have input on the success of our students at meeting the program objectives. The faculty monitor alumni and we closely monitor the success of our undergraduates in our own graduate program. They also monitor the survey and review board feedback to see if we need to incorporate program changes to better achieve the program objectives.

#### Table 6-1. Faculty Qualifications

#### **Bachelor of Science in Computer Engineering**

			ు	ß	Ex	Years o xperien	of ice	tion/	Level H	l of Act , M, or	ivity <sup>4</sup> L
Faculty Name	Highest Degree Earned- Field and Year	Rank <sup>1</sup>	Type of Academi Appointment <sup>2</sup> T, TT, NTT	FT or PT	Govt./Ind. Practice	Teaching	This Institution	Professional Registra Certification	Professional Organizations	Professional Development	Consulting/summer work in industry
Arnold, David P.	PhD, EE 2004	ASC	Т	FT	0	7	7	None	М	Н	L
Arroyo, A. Antonio	PhD, EE, 1981	ASC	Т	FT	4	27	27	PE FL	М	L	L
Banerjee, Arunava	PhD, CS, 2001	ASC	Т	FT	0	9	9	None	Н	Н	None
Bashirullah, Rizwan	PhD, EE, 2004	ASC	Т	FT	1	9	9	None	М	М	L
Bermudez, Manuel E.	PhD, CISE,1984	ASC	Т	FT	0	30	27	Non e	М	М	М
Bolton, Jeremy	PhD, CE, 2008	0	NTT	FT	0	1	1	None	Н	Н	Н

Instructions: Complete table for each member of the faculty in the program. Add additional rows or use additional sheets if necessary. <u>Updated information is to be provided at the time of the visit</u>.

- 2. Code: T = Tenured TT = Tenure Track NTT = Non Tenure Track
- 3. Code: FT = Full-time PT = Part-time Appointment at the institution.

<sup>1.</sup> Code: P = Professor ASC = Associate Professor AST = Assistant Professor I = Instructor A = Adjunct O = Other

					Years	of Exp	erience	١/	Leve	el of Act	ivity <sup>4</sup>
			lic	L3				atior	I	H, M, or	L
Faculty Name	Highest Degree Earned- Field and Year	Rank <sup>1</sup>	Type of Acaden Appointment <sup>2</sup> T, TT, NTT	FT or P	Govt./Ind. Practice	Teaching	This Institution	Professional Registr Certification	Professional Organizations	Professional Development	Consulting/summer work in industry
Bosman, Gijs	PhD, Phys, 1981	Р	Т	FT	0	31	31	None	М	Н	L
Chen, Shigang	PhD, CS, 1999	ASO	Т	FT	3	10	10	None	Н	Н	L
Chen, Su-Shing	PhD CIS, 1971	Р	Т	FT				None	М	L	L
Chow, Randy	PhD, CS, 1977	Р	Т	FT	3	35	31	None	М	Н	L
Dankel, Douglas	PhD, CIS, 1980	AST	Т	FT	0	33	31	None	Н	L	L
Davis, Timothy	PhD, CS, 1989	Р	Т	FT	2	22	22	None	Н	Н	Н

Instructions: Complete table for each member of the faculty in the program. Add additional rows or use additional sheets if necessary. Updated information is to be provided at the time of the visit.

1. Code: P = Professor ASC = Associate Professor AST = Assistant Professor I = Instructor A = Adjunct O = Other

2. Code: T = Tenured TT = Tenure Track NTT = Non Tenure Track

3. Code: FT = Full-time PT = Part-time Appointment at the institution.

						Years of	of		Leve	el of Act	ivity <sup>4</sup>
			nic	$\Gamma^3$	E	xperie	nce	ation	I	H, M, or	L
Faculty Name	Highest Degree Earned- Field and Year	Rank	Type of Acaden Appointment <sup>2</sup> T, TT, NTT	FT or P	Govt./Ind. Practice	Teaching	This Institution	Professional Registi Certification	Professional Organizations	Professional Development	Consulting/summer work in industry
Dobra, Alin	PhD, CIS, 2003	AST	Т	FT	0	9	9	None	L	Н	L
Eisenstadt, William	PhD, EE, 1986	Р	Т	FT	0	28	28	None	М	М	Н
Fang, Yuguang 'Michael'	PhD, EECS, 1997	Р	Т	FT	3	13	12	None	Н	Н	L
Figueiredo, Renato	PhD, CEN, 2001	ASC	Т	FT	0	11	10	None	М	Н	L
Fishwick, Paul	PhD, CIS, 1986	Р	Т	FT	5	26	26	None	Н	Н	М
Fortes, Jose	PhD, EE, 1978	Р	Т	FT	1	30	11	None	Н	Н	L

Instructions: Complete table for each member of the faculty in the program. Add additional rows or use additional sheets if necessary. <u>Updated information is to be provided at the time of the visit</u>.

1. Code: P = Professor ASC = Associate Professor AST = Assistant Professor I = Instructor A = Adjunct O = Other

2. Code: T = Tenured TT = Tenure Track NTT = Non Tenure Track

3. Code: FT = Full-time PT = Part-time Appointment at the institution.

Table 6-1. Faculty Qualifications (continued)
Bachelor of Science in Computer Engineering

			0		E	Years o Experien	of ce	tion/	Leve H	l of Acti I, M, or I	vity <sup>4</sup> L
Faculty Name	Highest Degree Earned- Field and Year	Rank <sup>1</sup>	Type of Academic Appointment <sup>2</sup> T, TT, NTT	FT or PT <sup>3</sup>	Govt./Ind. Practice	Teaching	This Institution	Professional Registrat Certification	Professional Organizations	Professional Development	Consulting/summer work in industry
Fox, Robert	PhD, EE, 1986	ASC	Т	FT	7	26	26	None	М	Н	L
Gader, Paul	PhD, MA, 1986	Р	Т	FT	3	23	11	None	М	Н	Н
George, Alan	PhD, CSC, 1991	Р	Т	FT	7	25	15	None	М	Н	L
Gordon-Ross, Ann	PhD, CSE, 2007	AST	TT	FT	0	8	5	None	Н	Н	L
Gu, Qun 'Jane'	PhD, EE, 2007	AST	TT	FT	3	2	2	None	М	Н	L
Gugel, Karl	PhD, ECE, 1993	0	Т	FT	13	10	10	None	М	L	L

Instructions: Complete table for each member of the faculty in the program. Add additional rows or use additional sheets if necessary. <u>Updated information is to be provided at the time of the visit</u>.

1. Code: P = Professor ASC = Associate Professor AST = Assistant Professor I = Instructor A = Adjunct O = Other

2. Code: T = Tenured TT = Tenure Track NTT = Non Tenure Track

3. Code: FT = Full-time PT = Part-time Appointment at the institution.

					,	Years of	f	>	Leve	el of Act	ivity <sup>4</sup>
			i	$\Gamma^3$	E	xperien	ce	ration	]	H, M, or	L
Faculty Name	Highest Degree Earned- Field and Year	Rank	Type of Acaden Appointment <sup>2</sup> T, TT, NTT	FT or P	Govt./Ind. Practice	Teaching	This Institution	Professional Registi Certification	Professional Organizations	Professional Development	Consulting/summer work in industry
Guo, Jing	PhD, EE, 2004	ASC	Т	FT	0	8	8	None	М	М	L
Hammer, Jacob	DSc, EE, 1980	Р	Т	FT	5	20	25	None	М	М	L
Harris, John	PhD, EE, 1991	Р	Т	FT	2	19	19	None	М	М	L
Helal, Abdelsalam	PhD, CS, 1991	Р	Т	FT	6	19	14	None	Н	Н	Н
Ho, Jeffrey	PhD, CIS, 1999	AST	NT	FT	0	8	8	None	L	Н	L
Jordan, Douglas	PhD, EE, 1990	0	NTT	FT	14	19	18	None	М	L	L

Instructions: Complete table for each member of the faculty in the program. Add additional rows or use additional sheets if necessary. <u>Updated information is to be provided at the time of the visit</u>.

1. Code: P = Professor ASC = Associate Professor AST = Assistant Professor I = Instructor A = Adjunct O = Other

2. Code: T = Tenured TT = Tenure Track NTT = Non Tenure Track

3. Code: FT = Full-time PT = Part-time Appointment at the institution.

					Y Ex	ears o perien	f ce	on/	Leve	l of Act	ivity <sup>4</sup> L
Faculty Name	Highest Degree Earned- Field and Year	Rank <sup>1</sup>	Type of Academic Appointment <sup>2</sup> T, TT, NTT	FT or PT <sup>3</sup>	Govt./Ind. Practice	Teaching	This Institution	Professional Registrati Certification	Professional Organizations	Professional	Consulting/summer work in industry
Jung, Youna	PhD, CSC, 2007	0	NTT	FT	3	1	1	None	L	М	L
Kahveci, Tamer	PhD, CS, 2004	ASC	Т	FT	0	8	8	None	Н	Н	Ν
Khargonekar, Pramod	PhD, EE, 1981	Р	Т	FT	0	31	11	None	М	М	L
Kim, Gloria Jung A.	PhD, BME, 2007	0	NTT	FT	3	0	2	None	Н	L	L
Lam, Herman	PhD, EE, 1979	ASC	Т	FT	6	33	32	None	Н	М	L
Latchman, Haniph	PhD, EE, 1986	Р	Т	FT	5	26	26	None	Н	Н	L

Instructions: Complete table for each member of the faculty in the program. Add additional rows or use additional sheets if necessary. <u>Updated information is to be provided at the time of the visit</u>.

1. Code: P = Professor ASC = Associate Professor AST = Assistant Professor I = Instructor A = Adjunct O = Other

2. Code: T = Tenured TT = Tenure Track NTT = Non Tenure Track

3. Code: FT = Full-time PT = Part-time Appointment at the institution.

					E	Years	of	/u	Leve	el of Acti	ivity <sup>4</sup>
		_	<sup>2</sup>	$T^3$	E2	sperie	nce	ratio	H	I, M, or	L
Faculty Name	Highest Degree Earned- Field and Year	Rank	Type of Acader Appointment T, TT, NTT	FT or P	Govt./Ind. Practice	Teaching	This Institution	Professional Regist Certification	Professional Organizations	Professional Development	Consulting/summer work in industry
Law, Mark	PhD, EE, 1988	Р	Т	FT	2	24	24	None	Н	Н	L
Li, Jian	PhD, EE, 1991	Р	Т	FT	1	19	19	None	М	Н	L
Li, Tao	PhD, ECE, 2004	ASC	Т	FT	3	8	8	None	М	М	L
Li, Xiaolin 'Andy'	PhD, CEN, 2005	ASC	TT	FT	4	7	2	None	М	Н	L
Lin, Jenshan	PhD, EE, 2004	Р	Т	FT	14	11	9	None	Н	Н	L
Liu, Jonathan	PhD, CISE, 1996	ASC	Т	FT	3	16	13	None	Н	Н	Н

Instructions: Complete table for each member of the faculty in the program. Add additional rows or use additional sheets if necessary. <u>Updated information is to be provided at the time of the visit</u>.

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2. Code: T = Tenured TT = Tenure Track NTT = Non Tenure Track

3. Code: FT = Full-time PT = Part-time Appointment at the institution.

					, in the second se	Years o	of	1	Leve	el of Ac	tivity <sup>4</sup>
			ic	5	Ех	xperien	ice	atior	I	H, M, oi	Ľ
Faculty Name	Highest Degree Earned- Field and Year	Rank <sup>1</sup>	Type of Academ Appointment <sup>2</sup> T, TT, NTT	FT or P1	Govt./Ind. Practice	Teaching	This Institution	Professional Registr Certification	Professional Organizations	Professional Development	Consulting/summer work in industry
Lok, Benjamin	PhD, CIS, 2002	ASC	Т	FT	0	9	9	None	L	Н	М
Maghari, Nima	PhD, 2010	AST	Т	FT	0	1	1	None	L	L	L
Matsunaga, Andrea	PhD, ECE, 2010	0	NTT	FT	0	0	2	None	М	М	L
McNair, Janise	PhD, ECE, 2000	ASC	Т	FT	1	12	12	None	М	L	L
McNeill, Seth	PhD, ECE, 2009	0	NTT	FT	3	1	1	None	L	М	L
Meyn, Sean P.	PhD, EE, 1985	Р	Т	FT	0	24	1	None	М	Н	Н

Instructions: Complete table for each member of the faculty in the program. Add additional rows or use additional sheets if necessary. <u>Updated information is to be provided at the time of the visit</u>.

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2. Code: T = Tenured TT = Tenure Track NTT = Non Tenure Track

3. Code: FT = Full-time PT = Part-time Appointment at the institution.

						Years c	of	/	Leve	el of Ac	tivity <sup>4</sup>
			nic	$\Gamma^3$	Ex	xperier	ice	ation	1	H, M, o	r L
Faculty Name	Highest Degree Earned- Field and Year	Rank	Type of Acaden Appointment <sup>2</sup> T, TT, NTT	FT or P	Govt./Ind. Practice	Teaching	This Institution	Professional Registi Certification	Professional Organizations	Professional Development	Consulting/summer work in industry
Mishra, Prabhat	PhD, CS, 2004	ASC	Т	FT	4	8	8	None	М	Η	М
Mohseni, Kamran	PhD, ME, 2000	Р	TT	PT	0	11	2	None	Н	М	L
Moore, Robert	PhD, EE, 2007	AST	TT	FT	2	5	5	None	Н	Н	L
Newman, Richard	PhD, CISE, 1987	AST	Т	FT	2	26	26	None	Н	Н	Н
Nishida, Toshikazu	PhD, ECE 1988	Р	Т	FT	1	24	24	None	М	М	L
Peir, Jih-Kwon	PhD, CISE, 1986	ASC	Т	FT	8	18	18	None	М	Н	М

Instructions: Complete table for each member of the faculty in the program. Add additional rows or use additional sheets if necessary. <u>Updated information is to be provided at the time of the visit</u>.

1. Code: P = Professor ASC = Associate Professor AST = Assistant Professor I = Instructor A = Adjunct O = Other

2. Code: T = Tenured TT = Tenure Track NTT = Non Tenure Track

3. Code: FT = Full-time PT = Part-time Appointment at the institution.

					Ŋ	lears c	of	/	Leve	el of Ac	tivity <sup>4</sup>
			nic	$\Gamma^3$	Ех	perier	ice	ration	I	H, M, 01	Ľ
Faculty Name	Highest Degree Earned- Field and Year	Rank	Type of Acaden Appointment <sup>2</sup> T, TT, NTT	FT or P	Govt./Ind. Practice	Teaching	This Institution	Professional Registr Certification	Professional Organizations	Professional Development	Consulting/summer work in industry
Peters, Jorg	PhD, CS, 1990	Р	Т	FT	1	21	14	None	Н	Н	М
Principe, Jose	PhD, EE, 1979	Р	Т	FT	0	37	25	None	М	Н	L
Rakov, Vladimir	PhD, EE, 1983	Р	Т	FT	15	23	21	None	М	Н	L
Rangarajan, Anand	PhD, CISE, 1991	ASC	Т	FT		17	13	None	Н	Н	L
Ranka, Sanjay	PhD, CS, 1988	Р	Т	FT	3	21	14	None	Н	Н	Н
Rashidi, Parisa	PhD, CS, 2010	0	NTT	FT	1	1	1	None	Н	Н	Н

Instructions: Complete table for each member of the faculty in the program. Add additional rows or use additional sheets if necessary. <u>Updated information is to be provided at the time of the visit</u>.

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2. Code: T = Tenured TT = Tenure Track NTT = Non Tenure Track

3. Code: FT = Full-time PT = Part-time Appointment at the institution.

			Q	3	У Ех	Years o kperien	f ce	ttion/	Leve	el of Ac I, M, oi	tivity <sup>4</sup> : L
Faculty Name	Highest Degree Earned- Field and Year	Rank <sup>1</sup>	Type of Academi Appointment <sup>2</sup> T, TT, NTT	FT or PT	Govt./Ind. Practice	Teaching	This Institution	Professional Registra Certification	Professional Organizations	Professional Development	Consulting/summer work in industry
Ritter, Gerhard	PhD, MA, 1971	Р	Т	FT	5	40	40	None	Н	Н	L
Russell, Kathie	MA, English, 2000	0	NTT	FT	0	12	1	None	L	L	L
Sahni, Sartaj	PhD, CS,1973	Р	Т	FT	0	39	22	None	Н	Н	Н
Sanders, Beverly	PhD. CS, 1985	ASC	Т	FT	2	27	17	None	Н	Н	L
Schmalz, Mark S.	PhD. CE, 1996	0	NTT	FT	6	15	15	None	Н	Н	L
Schneider, Markus	PhD, CISE, 1995	ASC	Т	FT	0	11	11	None	L	Н	L

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1. Code: P = Professor ASC = Associate Professor AST = Assistant Professor I = Instructor A = Adjunct O = Other

2. Code: T = Tenured TT = Tenure Track NTT = Non Tenure Track

3. Code: FT = Full-time PT = Part-time Appointment at the institution.

					Years of Experience			J/	Level of Activity <sup>4</sup>			
			lic [73	atior				H, M, or L				
Faculty Name	Highest Degree Earned- Field and Year	Rank <sup>1</sup>	Type of Academ Appointment <sup>2</sup> T, TT, NTT	FT or PJ	Govt./Ind. Practice	Teaching	This Institution	Professional Registr Certification	Professional Organizations	Professional Development	Consulting/summer work in industry	
Schwartz, Eric	PhD, ECE, 1995	0	Т	FT	2	14	14	None	L	L	L	
Shea, John	PhD, EE, 1998	ASC	Т	FT	1	13	13	None	М	М	L	
Sitharam, Meera	PhD, CS, 1991	ASC	Т	FT	0	21	14	None	L	Н	L	
Srivastava, Ramakant	PhD, Phys,1973	0	NTT	FT	5	32	22	None	М	L	L	
Stitt, Gregory	PhD, CSC, 2007	AST	TT	FT	0	5	5	None	М	М	L	
Thai, My	PhD, CIS, 2006	ASC	TT	FT	0	6	6	None	L	Н	L	

Instructions: Complete table for each member of the faculty in the program. Add additional rows or use additional sheets if necessary. <u>Updated information is to be provided at the time of the visit</u>.

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2. Code: T = Tenured TT = Tenure Track NTT = Non Tenure Track

3. Code: FT = Full-time PT = Part-time Appointment at the institution.

			ic		Years of Experience			ation/	Level of Activity <sup>4</sup> H, M, or L		
Faculty Name	Highest Degree Earned- Field and Year	Rank <sup>1</sup>	Type of Academ Appointment <sup>2</sup> T, TT, NTT	FT or PT	Govt./Ind. Practice	Teaching	This Institution	Professional Registra Certification	Professional Organizations	Professional Development	Consulting/summer work in industry
Thebaut, Stephen	PhD, CS, 1983	AST	Т	FT	0	28	28	None	М	М	М
Thompson, Scott	PhD, ECE, 1992	Р	Т	FT	12	8	8	None	L	М	Н
Turner, Allen	PhD, EE, 1986	0	NTT	FT	8	18	8	None	L	L	L
Uman, Martin	PhD, EE, 1961	Р	Т	FT	6	44	31	None	М	Н	L
Ungor, Alper	PhD, CS, 2002	ASC	Т	FT	0	8	8	None	L	Н	N
Ural, Ant	PhD, EE, 2001	ASC	Т	FT	0	9	9	None	М	М	L

Instructions: Complete table for each member of the faculty in the program. Add additional rows or use additional sheets if necessary. <u>Updated information is to be provided at the time of the visit</u>.

1. Code: P = Professor ASC = Associate Professor AST = Assistant Professor I = Instructor A = Adjunct O = Other

2. Code: T = Tenured TT = Tenure Track NTT = Non Tenure Track

3. Code: FT = Full-time PT = Part-time Appointment at the institution.

					Years of Experience			Level of Activity <sup>4</sup>			
		iic li		3			Ex	atior	H, M, or L		
Faculty Name	Highest Degree Earned- Field and Year	Rank <sup>1</sup>	Type of Academ Appointment <sup>2</sup> T, TT, NTT	FT or P	Govt./Ind. Practice	Teaching	This Institution	Professional Registr Certification	Professional Organizations	Professional Development	Consulting/summer work in industry
Vemuri, Baba	PhD, CS, 1987	Р	Т	FT		25	25	None	Н	Н	L
Wilson, Joseph N.	PhD, CS, 1985	AST	Т	FT		27	27	None	Н	Н	Н
Wong, Tan	PhD, ECE, 1997	Р	Т	FT	3	13	13	None	Н	М	L
Wu, Dapeng 'Oliver'	PhD, ECE, 2003	ASC	Т	FT	4	9	9	None	Н	М	L
Wu, Wenshing	MS, EE, 1991	0	NTT	PT	18	6	6	None	L	L	L
Xia, Ye	PhD, EECS, 2003	ASC	Т	FT	2	9	9	None	L	Н	Н

Instructions: Complete table for each member of the faculty in the program. Add additional rows or use additional sheets if necessary. <u>Updated information is to be provided at the time of the visit</u>.

1. Code: P = Professor ASC = Associate Professor AST = Assistant Professor I = Instructor A = Adjunct O = Other

2. Code: T = Tenured TT = Tenure Track NTT = Non Tenure Track

3. Code: FT = Full-time PT = Part-time Appointment at the institution.

							Years of			n/	Level of Activity <sup>4</sup>			
		-	nic 2	$T^3$	Experience		ratio	ŀ	H, M, or L					
Faculty Name	Highest Degree Earned- Field and Year	Rank	Type of Acaden Appointment T, TT, NTT	FT or P	Govt./Ind. Practice	Teaching	This Institution	Professional Regist Certification	Professional Organizations	Professional Development	Consulting/summer work in industry			
Xie, Huikai	PhD, ECE, 2002	ASC	Т	FT	2	14	10	None	М	М	L			
Yavuz-Kahveci, Tuba	PhD, CS, 2004	0	NTT	FT	0.25	8	8	None	L	М	L			
Yoon, Yong Kyu	PhD, ECE, 2004	ASC	TT	FT	1	6	2	None	Н	Н	L			
Zhang, Rong	PhD, CIS, 2008	0	NTT	FT	0	3	3	None	М	L	L			
Zmuda, Henry	PhD, EE, 1984	ASC	Т	FT	0	30	17	None	L	М	L			

Instructions: Complete table for each member of the faculty in the program. Add additional rows or use additional sheets if necessary. <u>Updated information is to be provided at the time of the visit</u>.

1. Code: P = Professor ASC = Associate Professor AST = Assistant Professor I = Instructor A = Adjunct O = Other

2. Code: T = Tenured TT = Tenure Track NTT = Non Tenure Track

3. Code: FT = Full-time PT = Part-time Appointment at the institution.

#### Table 6-2. Faculty Workload Summary

#### **Bachelor of Science in Computer Engineering**

			Prog	ram Activity Distribution	on <sup>3</sup>	
Faculty Member (name)	PT or FT <sup>1</sup>	Classes Taught (Course No./Credit Hrs.) Term and Year <sup>2</sup>	Teaching	Research or Scholarship	Other <sup>4</sup>	% of Time Devoted to the Program <sup>5</sup>
Arnold, David P.	FT	F 2011: on Sabbatical Sp 2012: on Sabbataical	20	80		100
Arroyo, A. Antonio	FT	F 2011: EEL4665-4, EEL5666-4, EGN1935-2 Sp 2012: EEL4665-4, EEL5666-4, EEL6841-3, EGN1935-2	80	20		100
Banerjee, Arunava	FT	Fall 2011: COT6515	56	40	4	100
		Spring 2012: COT5405	83	10	7	100
Bashirullah, Bizwan	FT	F 2011: EEE4310-3 Sp 2012: FEI 6323-3	55	45		100
Bermudez, Manuel	FT	Fall 2011: COP5555	72	13	15	100
		Spring 2012: CEN3031; CGS2531	74	15	11	100
Bosman, Gijs	FT	F 2011: EEL6397-3 Sp 2012: EEE3396-3, EEE6352-3	65	25		100

1. FT = Full Time Faculty or PT = Part Time Faculty, at the institution

2. For the academic year for which the self-study is being prepared.

3. Program activity distribution should be in percent of effort in the program and should total 100%.

4. Indicate sabbatical leave, etc., under "Other."

			F	Program Activity Distribution	on <sup>3</sup>	
Faculty Member (name)	PT or FT <sup>1</sup>	Classes Taught (Course No./Credit Hrs.) Term and Year <sup>2</sup>	Teaching	Research or Scholarship	Other <sup>4</sup>	% of Time Devoted to the Program <sup>5</sup>
Chen, Shigang	FT	Fall 2011:	0	0	100 sabb	0
		Spring 2012:	50	0	50 sabb.	50
Chow, Randy	FT	Fall 2011: CNT 5410	86	10	4	100
		Spring 2012: COP5615	90	4	6	100
Dankel, Douglas	FT	Fall 2011: CAP4621; CAP5635; COP3504	92	6	2	100
		Spring 2012: CAP4053; CAP4680; CAP6685	80	2	18	100
Davis, Timothy	FT	Fall 2011: COT4501	41	53	6	100
		Spring 2012: COT3100	54	40	6	100
Diaz, Jose	PT	F2011: none Sp 2012: EEL3135-3	25	75		100
Dobra, Alin	FT	Fall 2011: CIS4301	50	40	10	100
		Spring 2012: COP6726	50	45	5	100

1. FT = Full Time Faculty or PT = Part Time Faculty, at the institution

2. For the academic year for which the self-study is being prepared.

3. Program activity distribution should be in percent of effort in the program and should total 100%.

4. Indicate sabbatical leave, etc., under "Other."

			Pro	ogram Activity Distribution	3	
Faculty Member (name)	PT or FT <sup>1</sup>	Classes Taught (Course No./Credit Hrs.) Term and Year <sup>2</sup>	Teaching	Research or Scholarship	Other <sup>4</sup>	% of Time Devoted to the Program <sup>5</sup>
Eisenstadt, William	FT	F 2011: EEE5322-3 Sp 2012: EEE4306-3	55	45		100
Entezari, Alireza	FT	Fall 2011: COT3100	36	60	4	100
		Spring 2012: CAP4730	35	59	6	100
Fang, Yuguang 'Michael'	FT	F 2011: EEL4598-3 Sp 2012: EEL6507-3	40	60		100
Figueiredo, Renato	FT	F 2011: EEL4930-3 Sp 2012: EEL6892-3	50	50		100
Fishwick, Paul	FT	Fall 2011: CAP4800, CAP5805	67	33	0	100
		Spring 2012: CAP4403; CAP6402	26	63	11	100
Fortes, Jose	FT	F 2011: EEL6935-3 Sp 2012: EEL6935-3	15	85		100
Fox, Robert	FT	F 2011: EEE5320-3 Sp 2012: EEE6321-3	35	30	35	100

1. FT = Full Time Faculty or PT = Part Time Faculty, at the institution

2. For the academic year for which the self-study is being prepared.

3. Program activity distribution should be in percent of effort in the program and should total 100%.

4. Indicate sabbatical leave, etc., under "Other."

<b>Table 6-2.</b>	Faculty '	Workloa	ad Summ	ary (continued)
Bachelo	or of Scien	nce in C	omputer	Engineering

				Program Activity Distrib	ution <sup>3</sup>	
Faculty Member (name)	PT or FT <sup>1</sup>	Classes Taught (Course No./Credit Hrs.) Term and Year <sup>2</sup>	Teaching	Research or Scholarship	Other <sup>4</sup>	% of Time Devoted to the Program <sup>5</sup>
Gader, Paul	FT	Fall 2011:	24	76	0	100
		Spring 2012:	37	2	61 leave of ab	100
George, Alan	FT	F 2011: EEL5764-3 Sp 2012: EEL6763-3	40	60		100
Goetten, Jim	FT	F 2011 & Sp 2012: none	33	33	34	100
Gordon-Ross, Ann	FT	F 2011: EEL6935-3 Sp 2012: EEL4713-4	40	60		100
Gu, Qun 'Jane'	FT	F 2011: EEL6935-3 Sp 2012: EEE6328-3	33	66		100
Gugel, Karl	FT	F 2011: EEL4744-4, EEL4924-3 Sp 2012: EEL 3701-4	60	40		100

1. FT = Full Time Faculty or PT = Part Time Faculty, at the institution

For the academic year for which the self-study is being prepared.
 Program activity distribution should be in percent of effort in the program and should total 100%.
 Indicate sabbatical leave, etc., under "Other."

			Pro	gram Activity Distribution	3	
Faculty Member (name)	PT or FT <sup>1</sup>	Classes Taught (Course No./Credit Hrs.) Term and Year <sup>2</sup>	Teaching	Research or Scholarship	Other <sup>4</sup>	% of Time Devoted to the Program <sup>5</sup>
Guo, Jing	FT	F 2011: EEE5426-3, EEE4420-3 Sp 2012: EEE6428-3	60	40		100
Hammer, Jacob	FT	F 2011: EEL3112-3, EEL4657-3, EEL 4657L-1 Sp 2012: EEL2000-3, EEL6614-3	80	20		100
Harris, John	FT	F 2011 & Sp 2012: none	10	30	60	100
Helal, Abdelsalam	FT	Fall 2011:	4	51	45	100
		Spring 2012:	3	55	42	100
Helmy, Ahmed	FT	Fall 2011: CNT4007C	45	50	10	100
		Spring 2012: CIS4930; CIS6930	40	57	3	100
Ho, Jeffrey	FT	Fall 2011: CIS6930	40	55	5	100
		Spring 2012: COT4501	35	62	3	100

1. FT = Full Time Faculty or PT = Part Time Faculty, at the institution

For the academic year for which the self-study is being prepared.
 Program activity distribution should be in percent of effort in the program and should total 100%.

4. Indicate sabbatical leave, etc., under "Other."

				Program Activity Distrib	ution <sup>3</sup>	
Faculty Member (name)	PT or FT <sup>1</sup>	Classes Taught (Course No./Credit Hrs.) Term and Year <sup>2</sup>	Teaching	Research or Scholarship	Other <sup>4</sup>	% of Time Devoted to the Program <sup>5</sup>
Jordan, Douglas	FT	F 2011 & Sp 2012: none	0	100	0	100
Jung, Youna	FT	F 2011 & Sp 2012: none	0	100	0	100
Judge, Jasmeet (affiliate)	PT	Sp 2012: EEL3402-3	25	0	0	25
Kahveci, Tamer	FT	Fall 2011: CAP5510	42	50	4	100
		Spring 2012:	0	9	91	100
Kahveci, Tuba	FT	Fall 2011:	0	0	100 sabbatical	0
		Spring 2012:	0	0	100 sabbatical	0
Khargonekar Pramod	FT	F 2011: EEL3105-3			100	100
Kilaigonekai, I tainou		Sp 2012: EEL6935-3				
Kim, Gloria	FT	F 2011 & Sp 2012: none	0	100	0	100

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2. For the academic year for which the self-study is being prepared.

3. Program activity distribution should be in percent of effort in the program and should total 100%.

4. Indicate sabbatical leave, etc., under "Other."

			Pro	gram Activity Distribution	3	
Faculty Member (name)	PT or FT <sup>1</sup>	Classes Taught (Course No./Credit Hrs.) Term and Year <sup>2</sup>	Teaching	Research or Scholarship	Other <sup>4</sup>	% of Time Devoted to the Program <sup>5</sup>
Kurtz, James	FT	F 2011 & Sp 2012: none		100		100
Lam, Herman	FT	F 2011: EEL2000-2, EEL4712-4 Sp 2012: EEL4930-3, EEL5934-3	40	60		100
Latchman, Haniph	FT	F 2011: EEL5182-3 Sp 2012: EEL3105-3, EEL4657-3, EEL4657L-1	35	65		100
Law, Mark	FT	F 2011 & Sp 2012: none		25	75	100
Li, Jian	FT	F 2011: EEL3135-3 Sp 2012: EEL6935 -3	25	75		100
Li, Tao	FT	F 2011: EEL3701-4 Sp 2012: EEL6935-3	35	65		100
Li, Xiaolin 'Andy'	FT	F 2011: EEL6935-3 Sp 2012: EEL6935-3	30	70		100

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3. Program activity distribution should be in percent of effort in the program and should total 100%.

4. Indicate sabbatical leave, etc., under "Other."

Table 6-2.	<b>Faculty Wor</b>	kload Sumn	nary (continued)
Bachelo	or of Science i	n Computei	· Engineering

			Pro	ogram Activity Distribution		
Faculty Member (name)	PT or FT <sup>1</sup>	Classes Taught (Course No./Credit Hrs.) Term and Year <sup>2</sup>	Teaching	Research or Scholarship	Other <sup>4</sup>	% of Time Devoted to the Program <sup>5</sup>
Lin, Jenshan	FT	F 2011: None Sp 2012: EEE 6374-3	35	65		100
Liu, CL	FT	Fall 2011: CIS6930; COP3275	63	30	7	100
		Spring 2012: CNT4007C; CNT6107	80	14	6	100
Lok, Benjamin	FT	Fall 2011:	34	66	0	100
		Spring 2012: CAP5100	30	65	5	100
Maghari, Nima	FT	F 2011: EEL 6935-3 Sp 2012: EEL6935-3	35	65		100
Matsunaga, Andrea	FT	F 2011 & Sp 2012: none		100		100
McNair, Janise	FT	F 2011: EEL5718-3 Sp 2012: EEL6591-3	55	45		100

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3. Program activity distribution should be in percent of effort in the program and should total 100%.

4. Indicate sabbatical leave, etc., under "Other."

			Program Activity Distribution <sup>3</sup>			
Faculty Member (name)	PT or FT <sup>1</sup>	Classes Taught (Course No./Credit Hrs.) Term and Year <sup>2</sup>	Teaching	Research or Scholarship	Other <sup>4</sup>	% of Time Devoted to the Program <sup>5</sup>
McNeill, Seth	PT	F 2011: EEL3834-3	25			25
		Sp 2012: EEL6825-3				
Mishra, Prabhat	FT	Fall 2011: CDA5636; CIS4930	40	52	8	100
		Spring 2012: CDA5155	27	62	11	100
Maara Dahart	FT	F 2011: EEL6486-3	35	65		100
Moore, Robert		Sp 2012: EEL3472-3				
Newman, Richard	FT	Fall 2011: COP4600; COP5615	79	18	3	100
		Spring 2012: CNT5106C; COP4600	86	10	4	100
Nichido Techiltory	FT	F 2011: EEL3923-3, EEE4331-3, EEE5405-3	40	60		100
INISHIDA, I OSMIKAZU		Sp 2012: EEE6390-3				
Overman Ched	FT	F 2011: none		100		100
Overman, Chad		Sp 2012: none				

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Program activity distribution should be in percent of effort in the program and should total 100%.
 Indicate sabbatical leave, etc., under "Other."

				Program Activity Distrib	ution <sup>3</sup>	
Faculty Member (name)	PT or FT <sup>1</sup>	Classes Taught (Course No./Credit Hrs.) Term and Year <sup>2</sup>	Teaching	Research or Scholarship	Other <sup>4</sup>	% of Time Devoted to the Program <sup>5</sup>
Peir, Jih-Kwon	FT	Fall 2011: CDA4102; CDA5155	48	32	20	100
		Spring 2012: CIS6930	35	30	35	100
Peters, Jorg	FT	Fall 2011: CAP5705	42	48	10	100
		Spring 2012	0	0	100 sabbatical	0
Principe, Jose	FT	F 2011: EEL 6814-3 EEL6502-3	40	60		100
Rakov, Vladimir	FT	F 2011: EEL 3472-3 EEL4930-3, EEL3473-3	35	65		100
Rangarajan, Anand	FT	Fall 2011: CAP6617	0	100	0	100
		Spring 2012: CAP 6610	30	61	9	100
Ranka, Sanjay	FT	Fall 2011: COT5405	42	51	7	100
		Spring 2012: CIS6930	23	2	75	100

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Program activity distribution should be in percent of effort in the program and should total 100%.
 Indicate sabbatical leave, etc., under "Other."

			Program Activity Distribution <sup>3</sup>			% of Time	
Faculty Member (name)	PT or FT <sup>1</sup>	Classes Taught (Course No./Credit Hrs.) Term and Year <sup>2</sup>	Teaching	Research or Scholarship	Other <sup>4</sup>	Devoted to the Program <sup>5</sup>	
Russell, Kathie	РТ	F 2011: none Sp 2012: EEL6935-3	25			25	
Sahni, Sartaj	FT	Fall 2011: COP5536	5	95	0	100	
		Spring 2012	0.0	50	50	100	
Sanders, Beverly	FT	Fall 2011: COP5618	48	45	7	100	
		Spring 2012: COP5555	40	53	7	100	
Schmalz, Mark	FT	Fall 2011: CDA3101; CEN4914, CIS4914	80	20	0.0	100	
		Spring 2012: CDA3101; CEN4914, CIS4914, CDA3101	45	55	0.0	100	
Schneider, Markus	FT	Fall 2011: COP5725	41	54	5	100	
		Spring 2012: COP5725	35	60	5	100	

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2. For the academic year for which the self-study is being prepared.

Program activity distribution should be in percent of effort in the program and should total 100%.
 Indicate sabbatical leave, etc., under "Other."

<b>Table 6-2.</b>	Faculty Workload Summary (continued	l)
Bachelo	or of Science in Computer Engineering	

			Progr	Program Activity Distribution <sup>3</sup>			
Faculty Member (name)	PT or FT <sup>1</sup>	Classes Taught (Course No./Credit Hrs.) Term and Year <sup>2</sup>	Teaching	Research or Scholarship	Other <sup>4</sup>	% of Time Devoted to the Program <sup>5</sup>	
	FT	F 2011: EGN1935-2, EEL5666C-4,	75	25		100	
Schwartz, Eric		EEL3701C-4					
~		SP 2012: EEL4665-4, EEL4744-4, EGN1935-2,					
		EEL4924-3, EEL5666-4					
Shaa John	FT	F 2011: EEL 5544-3	35	65		100	
Silea, Joini		Sp 2012: EEL 6509-3, EEL 6535-3					
Sitharam, Meera	FT	Fall 2011: CIS6930	51	43	6	100	
		Spring 2012: sabbatical	25	41	4	70	
Srivastava,	PT	F 2011: EEL 3111-4	25			25	
Ramakant		Sp 2012: EEL 3111-4					
	FT	F 2011: EEL4930-3,EEL5934-3	50	50		100	
Suu, Gregory		Sp 2012: EEL4712-4					
Teeden Fred	PT	F 2011: EEL6527	25			25	
Taylor, Fred		Sp 2012: EEL3112-3					

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Program activity distribution should be in percent of effort in the program and should total 100%.
 Indicate sabbatical leave, etc., under "Other."

			Program Activity Distribution <sup>3</sup>			
Faculty Member (name)	PT or FT <sup>1</sup>	Classes Taught (Course No./Credit Hrs.) Term and Year <sup>2</sup>	Teaching	Research or Scholarship	Other <sup>4</sup>	% of Time Devoted to the Program <sup>5</sup>
Thai, My	FT	Fall 2011: COT5442	35	60	5	100
		Spring 2012:CAP5515	35	60	5	100
Thebaut, Stephen		Fall 2011: CEN5035;	35	0	65	100
	FT	Spring 2011: CEN6070	40	0	60	100
Thompson Scott	FT	F 201:EEE4329-3, EEL5400-3	10	90		100
Thompson, Scott		Sp 2012: EEE4310-3				
Trivedi Bhadravu I	PT	F 2011: EEL 3135-3	25			25
Thvear, Dhadraya J.		Sp 2012: none				
Tsuguwa, Mauricio	FT	F 2011 & Sp 2012: none		100		100
Turner Allen	FT	F 2011: EEE3308C-4, EEL 3211-3, EEL4201L-1	100			100
		Sp 2012: EEL3211-3, EEL3923-3, EEL4201L-1				

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2. For the academic year for which the self-study is being prepared.

3. Program activity distribution should be in percent of effort in the program and should total 100%.

4. Indicate sabbatical leave, etc., under "Other."

<b>Table 6-2.</b>	Faculty Workload Summary (continued)
Bachelo	or of Science in Computer Engineering

			Р	rogram Activity Distribu		
Faculty Member (name)	PT or FT <sup>1</sup>	Classes Taught (Course No./Credit Hrs.) Term and Year <sup>2</sup>	Teaching	Research or Scholarship	Other <sup>4</sup>	% of Time Devoted to the Program <sup>5</sup>
Uman, Martin	FT	F 2011 & Sp 2012: none	35	65		100
Ungor, Alper	FT	Fall 2011	0	0	100 sabb	0
		Spring 2012	0	0	100 sabb	0
Ural, Ant	FT	F 2011: EEE3396-3, EEE6431-3 Sp 2012: EEL6935-3	35	65		100
Vemuri, Baba	FT	Fall 2011: CAP5416	36	55	9	100
		Spring 2012: CAP6515	35	56	9	100
Wilson, Joseph	FT	Fall 2011: CIS4930	38	54	8	100
		Spring 2012: COP4020	35	57	8	100
W. T	FT	F 2011: EEL4514-3, EEL4514L-1, EEL6935-	35	65		100
wong, 1an		3 Sp 2012: EEL4514-3, EEL4514L-1				

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For the academic year for which the self-study is being prepared.
 Program activity distribution should be in percent of effort in the program and should total 100%.

4. Indicate sabbatical leave, etc., under "Other."

			Program Activity Distribution <sup>3</sup>			
Faculty Member (name)	PT or FT <sup>1</sup>	Classes Taught (Course No./Credit Hrs.) Term and Year <sup>2</sup>	Teaching	Research or Scholarship	Other <sup>4</sup>	% of Time Devoted to the Program <sup>5</sup>
Wu Dapang	FT	F 2011: EEL6562-3	45	55		100
wu, Dapeng		Sp 2012: EEL6509-3				
Wu Wenshing	FT	F 2011: EEL 3003-3	50			50
wu, wenshing		Sp 2011-EEL 3003-3				
Xia, Ye	FT	Fall 2011: CNT5106	22	73	5	100
		Spring 2012: CIS6930	28	63	9	100
Via Unikai	FT	F 2011: EEL5225-3	15	60	25	100
Ale, Huikai		Sp 2012: EEE6465-3				
Voon Vong Vou	FT	F 2011: EEE6460-3	35	65		100
1001, 1011g Kyu		Sp 2012: EEE3308-4				

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3. Program activity distribution should be in percent of effort in the program and should total 100%.

4. Indicate sabbatical leave, etc., under "Other."

			Program Activity Distribution <sup>3</sup>			
Faculty Member (name)	PT or FT <sup>1</sup>	Classes Taught (Course No./Credit Hrs.) Term and Year <sup>2</sup>	Teaching	Research or Scholarship	Other <sup>4</sup>	% of Time Devoted to the Program <sup>5</sup>
Zhang, Rong	FT	Fall 2011:COP3502	94	0	6	100
		Spring 2012: CAP3034; CAP3032	94	0	6	100
Zmuda, Henry	FT	F 2011: EEL4458-3, EEL5441-3 Sp 2012: EEL4930-3, EEL6447-3	60	20	20	100

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2. For the academic year for which the self-study is being prepared.

3. Program activity distribution should be in percent of effort in the program and should total 100%.

4. Indicate sabbatical leave, etc., under "Other."

#### **CRITERION 7. FACILITIES**

#### A. Offices, Classrooms and Laboratories

#### **CISE Departmental Offices, Classrooms, and Labs**

In the main building (CSE Building, Bldg #42), CISE now has 48,096 square feet of space. Of this, 33,128 SF is office space, 5,495 SF is research laboratory space, 4,950 SF is instructional space, 1,875 SF is conference and seminar rooms, and 2,648 SF is miscellaneous space for systems rooms, maintenance, and storage. In addition, we now have 416 SF (room CSE-E202). The instructional space is either totally dedicated to CISE (as in labs) or is allotted to other departments on a per-semester basis if CISE does not claim it for a particular period (for classrooms only).

Six teaching laboratories are provided in the CSE Building, in addition to the general UF computer laboratories. These focus on multimedia, architecture, and graphics, and are of a size suitable for the classes assigned to them. Students often meet with instructors in these areas to acquire skills in a hands-on setting requiring specialized resources. These are:

- Room CSE E113: 16 PCs running Linux.
- Room CSE E114: 12 PCs running Linux, and 31 PCs running Windows.
- Room CSE E115: 24 PCs running Windows.
- Room CSE E116: 17 PCs running Linux.
- Room CSE E313: 3 PCS running Windows, and 12 PCs running Linux, all with high-end graphics capabilities.
- Room CSE E309: 18 PCS running Windows, used primarily for TAs to hold office hours.

CISE public labs are available 24/7 to anyone who has a CISE account. Labs are locked between 5PM and 7AM, and require a valid Gator 1 card to access them. Also, labs are monitored with security cameras. After-hours access to computer labs is granted using enrollment information. This information comes from the College of Engineering who in turn works directly with the Registrar. Downloads of enrollment information are done as often as the College permits. At the beginning of the semester downloads are done weekly. Afterwards, downloads are only done by special requests.

Four additional labs are available for course-specific work, corresponding to our four main Research Centers:

- Center for Vision, Graphics, and Medical Imaging (CVGMI)
- Database Systems Research and Development Center
- Mobile and Pervasive Computing Laboratory
- Computational Science and Intelligence Laboratory

Although these laboratories are primarily for research, the faculty who operate them often engage undergraduate students in their activities.

#### ECE Departmental Offices, Classrooms, and Labs

The ECE Department provides separate, well-equipped student teaching labs for electronic circuits, digital logic, communications, digital design, control systems, power systems, microcontrollers, and senior design. These laboratories are located on the second floor of the New Engineering Building and are available during laboratory class hours.

Since the 2006 ABET review significant investment has been made to ensure that the undergraduate educational labs are safe, comfortable, and equipped with appropriate, well-maintained instrumentation. Significant space relocation has resulted in a smoothly running environment free from usage conflicts. Laboratory infrastructure (work benches, lab computers, etc.) has been replaced or upgraded. Lab fees assessed on the students are now used to depreciate equipment so that measurement equipment is upgraded or replaced as soon as needed.

The Circuits Lab, located in NEB 250, includes 14 seats of National Instruments LabView and ELVIS II (Educational Library Virtual Instrument Suite) stations and associated multi-function I/O DAQ cards. These provide the students with a full complement of test and measurement equipment including a power supply, a digital multimeter, an oscilloscope and a function generator. Students construct various types of circuits and perform voltage, current and resistance network measurements to reinforce theory.

The Digital Logic Lab, located in NEB 248, students assemble and solder a complete printed circuit board that they use to program their CPLDs (Complex Programmable Logic Device), used to analyze the performance of digital logic circuits.

The Electronics Circuits Lab, located in NEB 213B, has Tektronix storage oscilloscopes and Agilent power supplies and function generators, which facilitate the study and analysis of both analog and digital electronics. Additionally, each seat has a workstation for PSpice or Multisim circuit simulations.

In the Digital Design and Microprocessors Lab, located in NEB 281, has Tektronix oscilloscopes and logic analyzers to explore the numerous functions and abilities of their microprocessor or Field-Programmable Gate Array (FPGA) development boards.

The Communications and Controls Lab, located in NEB 211, allows students the opportunity to explore a wide range of both digital and analog communication circuits. This lab is shared with the control systems lab. Each station is equipped with Agilent spectrum analyzers, frequency generators, mixed signal oscilloscopes, and power supplies. Each seat also has a workstation, which supports PSpice, LTspice, or Multisim circuit analysis along with Mathcad and Matlab.

The Power Lab, located in NEB 289, has four LabVolt Mechanical Training Systems allowing students to explore the principals of electric machines, transformers and magnetic circuits. Additionally, students see the effects that different loads (resistive, capacitive and inductive) have on a multi-phase power system. Each station also comes equipped with a Agilent mixed signal oscilloscope, power supply, function generator, and digital multimeter, as well as workstations with Pspice, LTspice, MathCAD, and MatLab.

The Senior Design Lab, located in NEB 212, has a variety of all the above equipment that the students use to develop a working product, which could potentially be patented and sold. This course is one of the capstones of the Electrical and Computer Engineering students' education; students must utilize analog and digital design as well as software development to successfully develop their projects. Students get the benefit of experienced consultation from our lab engineers for design advice, power efficiencies, and analog and digital circuit troubleshooting. Additionally, successful students learn how to protect their product and intellectual property, and develop a business plan for its manufacture.

#### **B.** Computing Resources

#### **University Laboratories:**

UF Academic Technology manages and coordinates general computing equipment across the UF campus. They operate six laboratories:

The Architecture 188 Open Area has 4iMacs, 16PCs, and 5 color scanners. The ARCH 116 Classroom has 32 PCs and a teacher workstation. The ARCH 120 classroom has 22 iMacs, 5 color scanners, and teacher workstation. [ARCH]

CBD Building 105 operates 24 PCs, 6 color scanners, and a teacher workstation in a classroom (room 110B). They provide 4 PCs in an open area (room 110A). [CDB]

The CSE E211 Open Area operates 191 PCs, 11 iMacs, 10 laptop plug-in stations, and 25 color scanners. Up to 98 of the PCs can be reserved for student exams. The CSE E211A classroom operates 29 PCs, 8 color scanners, and a teacher workstation. This facility is located in the same building as the CISE Department, which makes it very convenient for students. [CSE]

The Hub 0120 and 0124 Computer Area operates 13 PCs. There is also a large area for students to congregate near these facilities (including a StarBucks), which facilitates collaboration. [HUB]

The Normal Hall G514 Open Area operates 16 iMacs, 13 PCs, and 5 color scanners. The Normal G514i classroom operates 23 iMacs and a teacher workstation. The Norman G512 classroom operates 26 iMacs, 6 color scanners, and teacher workstation. [NOR]

The Weil Hall 408 Open Area operates 18 PCs and 5 color scanners. The Weil 408A classroom operates 26 PCs, a color scanner, and a teacher workstation. The Weil Hall classrooms in 408A, 408D, and 408E each operate 27 PCs, a color scanner, and a teacher workstation. [WEIL]

#### **CISE Departmental Computing Resources**

Five CPU servers (a Solaris SPARC, two Linux AMD 64 and two Windows 20008R2 servers) are available via SSH, VNC or remotedesktop to all users to run jobs on, and to log in to from remote locations. Services provided include web, email, database (Oracle, Postgres and MySQL), Kerberos/LDAP authentication, DNS, DHCP, backups, samba, NFS, and security related services. These tend to be some of the fastest machines in the department and have the most memory.

All faculty offices are equipped with a Windows or Linux workstation. Standard software installations include Ubuntu 10.04 or Windows 7, Java, jGRASP, many Microsoft packages due to the Microsoft Development Academic Alliance, Mozilla Firefox, Second Life, and XMing (X Windows on a Windows PC). Database software includes MySQL, PostgreSQL, and Oracle. Wireless access is available throughout the CSE Building and all of campus, including student dorms, cafeterias, and other public areas.

The classrooms in the CSE building have all been provided with multimedia support and a computer housed in a locked kiosk. In addition, all classrooms have access to the university's wireless network. That, combined with the college's requirement that all students possess an adequately provisioned laptop computer, makes it easy to access resources in the classrooms.

The bulk of the CISE's disk storage comes from an Oracle 7410 with 66TB of raw disk space. Other servers provide an additional 60TB. There are about 35 servers running a mix of Red Hat Enterprise Linux 6 and Solaris 10 providing such services as:

- Web hosting;
- Email;
- Database hosting—MySQL, PostgreSQL, Oracle;
- Kerberos / LDAP authentication;
- DNS;
- DHCP;
- Backups via Tivoli Storage Manager and disk based rsyncs;
- Samba;
- NFS;
- and security related services.

Our web servers run on a Sun T5220 server with Solaris 10, 32GB of memorym and 1.2 GHz UltraSPARC-T2 CPUs. They serve Department content, user content, and various web applications that support the Department. We have another Sun T5220, also running
Solaris 10, which is available to all Department users to run jobs on. It has 64GB of memory and UltraSPARC-T2 CPUs running at 1.2 GHz. We also have two Linux-based CPU servers with 16GB of memory and quad-core processors running at 2 GHz. We have, in total, about 100 Linux PCs running Ubuntu Desktop 10.04 and 130 Windows 7 PCs. They serve as lab machines and workstations for students, Teaching Assistants, Research Assistants, and Faculty. Of these, 58 Windows PCs and 65 Linux PCs are in public labs that are intended for general student use as well as use in lab sections of graduate and undergraduate classes.

We provide a compute cluster consisting of a head node with dual Opterons, 16GB of memory and 3.5TB of storage with 20 worker nodes with dual Opterons and 32GB of memory running Linux (Ubuntu Server 10.04). We also provide a GPU compute cluster of five machines, each with up to three different high end GPUs for those that make use of the unique compute capabilities that GPUs provide. These machines have dual twelve core CPU's, 64Gigabytes of memory and five TB of storage per node.

The networking in the Department consists mainly of 100 Mb and 1 Gb connections, except for the servers which utilize a minimum of 1 Gb connections, sometimes higher via EtherChannel. Cisco hardware is utilized as the backbone of our network and consists of one Catalyst 6513, one Catalyst 6509E, and three Catalyst 4506s—provides routing and switch capabilities to the more than 600 devices and 80 virtual networks in the Department. Our external connection is a 1 Gb fiber connection to the University of Florida's core network.

A unique printing solution allows the department to offering free printing based upon a quota system to all students and Teaching and Research assistance.

Our five CISE computer support staff is well equipped to handle the diverse array of equipment and software required to support the Computer Engineering program. Each staff person has their various primary expertise: Unix / Linux, Windows, applications, web, and hardware maintenance.

#### **ECE Departmental Computing Resources**

The Computer Teaching Laboratory, located in NEB 288, contains 34 Redhat Linux and eight Windows workstations and is open to students at all times. Additionally, students can access a remote group of 21 Redhat Linux and 21 Windows servers to accomplish their computing needs. This laboratory supports all Departmental undergraduate teaching. All of the Windows and Linux workstations are connected to the UNIX/Samba server and each has access to networked printers. The main Windows software includes many software packages such as Microsoft Office, PSPICE, MathCAD, Matlab, Agilent's ADS and RFDS, Ansoft's Designer, Saber, Maxwell and HFSS, and Altera's Quartus Web Edition. The main UNIX programs available are from Cadence, MathSoft, Ansoft, Agilent as well as several local computational resources such as the FLOOPS/FLOODS (FLorida Object Oriented Device and Process Simulator) program from the UF SWAMP (Software and Analysis of Advanced Materials Processing Center) Center.

Many of these commercial and open source resources derive from the interdisciplinary research results of both ECE and CISE faculty. For example, Dr. Mark Law (ECE) is the author of the FLOOPS/FLOODS semiconductor device and process simulation package. MATLAB, FLOOPS/FLOODS, and the packages from Cadence and Ansoft all rely on the same suite of sparse matrix solvers created by the research results by Dr. Timothy Davis (CISE). Davis' award-winning sparse solvers appear as  $x=A\b$  in MATLAB when A is sparse, for example, and are used in countless other commercial and open source applications such as these.

## C. Guidance

Both Departments, as well as UF Academic Technology, have extensive documentation on their respective websites, listing the available labs, and rules and regulations for appropriate and safe use of computing equipment. [CISE, ECE, AT]

The ECE Departmental laboratories employ full-time staff members who manage the laboratories. These individuals offer regular (formal) seminars of training and instruction on the proper usage of laboratory measurement equipment, tools, and software. They are also available on an individual basis to both students and faculty members for any special situations that may arise.

## D. Maintenance and Upgrading of Facilities

Both Departments maintains the tools and equipment by establishing the useful life of each piece and the number of students that use it annually. With this information we determine the cost per student hour of depreciating the equipment over its useful life. Whenever necessary, the University establishes a laboratory fee that enables each Department to recover the costs of equipment depreciation and degradation. Each Department has a Facilities Committee that monitors the use of equipment, and plans for computing equipment becoming obsolete.

#### E. Library Services

The Libraries of the University of Florida form the largest information resource system in the state of Florida. Collections cover virtually all disciplines and include a wide array of formats – from books and journals to manuscripts, maps, and recorded music. Increasingly collections are digital and are accessible on the Internet via the library web page or the <u>library catalog</u>. The George A. Smathers Libraries provide primary support to all academic programs except those served by the Lawton Chiles Legal Information Center. The major library facilities on campus are:

- <u>Library West</u> holds collections in the humanities and social sciences, including resources supporting the College of <u>Business</u>, <u>Africana Area Studies</u>, <u>East Asian</u> <u>Area Studies</u>, and the <u>Isser and Rae Price Library of Judaica</u>.
- <u>Smathers Library</u> holds the <u>Latin American Collection</u> and the <u>Special and Area</u> <u>Studies Collections</u> that include the University Archives, the PK Yonge Library of

Florida History, Baldwin Library of Historical Children's Literature, and the Rare Book Collection.

- <u>Marston Science Library</u> supports agriculture, engineering, mathematics, and the natural and physical sciences. The building also houses the <u>Government</u> <u>Documents Department</u> and the <u>Map and Imagery Library</u>.
- <u>Architecture and Fine Arts Library</u> (201 Fine Arts Building A) provides collections and services for architecture, fine arts, interior design, building construction, landscape architecture, and urban design.
- <u>Education Library</u> (1500 Norman Hall) holds education, child development, higher education, psychology, counseling, and children's literature collections.
- <u>Allen H. Neuharth Journalism and Communications Library</u> (1060 Weimer Hall) holds a collection relating to journalism, advertising, public relations, and telecommunication.
- <u>Music Library</u> (231 Music Building) holds music collections including books, scores, and recorded music.
- <u>UF Digital Collections</u> comprise a constantly growing collection of digital resources from the University of Florida's library collections as well as partner institutions.
- <u>Health Science Center Libraries</u> serve the academic, research and clinical information needs of the six UF health science colleges of Dentistry, Medicine, Nursing, Pharmacy, Public Health & Health Professions and Veterinary Medicine. <u>The Borland Library</u> (2nd floor, Learning Resource Center) is our Jacksonville branch, and the <u>Veterinary Medicine Reading Room</u> is located in room V1-110 in the CoVM Medicine Building.
- <u>Lawton Chiles Legal Information Center</u> at the <u>Fredric G. Levin College of Law</u> contains legal research materials supporting the study of state, federal, and international law. Notable collection areas include Florida, United States federal taxation, and British Commonwealth materials.

Specific to the program is the Marston Science Library, which supports agriculture, engineering, mathematics, and the natural and physical sciences. It is housed in the West Wing of the CSE Building, and has an extensive collections of Science Databases and Science journals, as well as science e-books. Faculty routinely place copies of course textbooks on reserve in the Marston Science Library. For the College of Engineering alone, the Marston Library has 6 subject specialists on staff, one of which is dedicated to the areas of Computer & Information Science and Engineering, and Electrical Engineering (Denise Bennett). The online system for searching for journal articles, books and e-books, dissertations [CSE, EE] is more than adequate for the needs of faculty and students in the Computer Engineering program.

UF Digital Collections comprise a constantly growing collection of digital resources from the University of Florida's library collections as well as its partner institutions.

Research assistance and help in locating information are available on site and by phone in each of the libraries. The Ask a Librarian service links users to librarians via instant messaging or email.

Requests for obtaining books or subscriptions are handled through the Technology & Support Services Division of the George A. Smathers Libraries at the University of Florida consists of seven departments of technical operations: Acquisitions Department; Cataloging & Metadata Department; Preservation Department; Access Support; Digital Services; Facilities & Security; and Information Technology.

Technology & Support Services serves the University of Florida's community by acquiring, organizing and preserving academic and scholarly information to support academic programs. The expertise in these departments encourages research endeavors and ensures access to print and digital resources through Web discovery systems, enhanced finding tools and Endeca, the Library catalog.

## F. Overall Comments on Facilities

System staff in the CISE Department and the ECE Department are responsible for installation, maintenance, and upgrading of the equipment used in the program, including the safe operation and maintenance of the equipment facilities.

Safe practice and proper usage of ECE laboratory facilities are carefully ensured for each and every laboratory course. The first meeting of every lab course covers lab conduct and policy including the necessary safety procedures. This information is provided by the lab instructor, generally a graduate teaching assistant, and overseen by the full-time laboratory support specialists and the faculty member responsible for the lab.

It is ECE Department policy that safety can never be stressed enough and safety awareness and training is dealt with proactively at the departmental level and is accomplished through a program of lab safety training.

In general, the protocol for lab safety training consists of two steps: (1) general safety training by Environment, Health and Safety (EH&S) and (2) lab specific training. EH&S general training is provided at least once a semester. Lab specific training is arranged by the faculty member responsible for the lab. Either each faculty member trains his/her students in person or requests help from EH&S for training. The goals of the training are to:

- Educate the students about the importance of lab safety
- Prevent any safety accidents
- Minimize any damage if accidents occur.

Implementation and oversight of the safety-training program for the department is under the supervision of ECE faculty member Dr. Y.K. Yoon.

# **CRITERION 8. INSTITUTIONAL SUPPORT**

## A. Leadership

Both Departments are led by a Chair, and have at least one Associate Chair. In addition, both Departments have faculty designated as Undergraduate Coordinator and Graduate Coordinator. The Chairs of both Departments have recently ended long-term appointments, Dr. Sartaj Sahni for 10 years in CISE, and Dr. Mark Law in ECE for a similar number of years. These long-term appointments have given the Departments stability and growth. CISE Department currently has an interim Chair, Dr. Paul Gader in CISE. Dr. John Harris was interim chair for ECE in 2010 and is now the permanent chair of that department.

In both Departments, Chairs have overall responsibility for all academic programs administered by their Department, and are responsible for ensuring a collegial atmosphere that's conducive to the quality of the Computer Engineering program. Chairs convene and preside over regular faculty meetings, which are the primary mechanism for decision making in the Department.

#### B. Program Budget and Financial Support

Department budgets are allocated by the Dean of the College of Engineering, in consultation with the respective Chair of each Department. Department Chairs report annually to the Dean their budget needs.

Teaching is supported by assigning Teaching Assistants to many courses, primarily on the basis of enrollments. In the CISE Department, a course with 20-40 students, for example, would typically be assigned one (25% FTE) TA (the ratio of TAs to students enrolled decreases significantly as class size increases). A similar arrangement operates in the ECE Department. Teaching Assistants are invariably graduate students in the discipline.

Both Departments actively engage their contacts in industry, to secure gifts of laboratory equipment and infrastructure. Harris Corporation has made several donations to the CISE Department in recent years, including a recent remodeling of the CISE Department's central office area.

All of the resources mentioned above are adequate for the needs of the Computer Engineering students.

## C. Staffing

Each Department has several full-time administrative positions (secretarial, financial) to help in daily operations.

## **CISE Staffing**

The CISE Department has a total of 14.5 staff positions. These include 10 administrative staff positions: two undergraduate academic advisors, two graduate academic advisors, one grants specialist, three secretaries, a director of financial operations (shared with another department) and one office manager. CISE also has four system administration positions, who manage the hardware and software resources of the Department. Two additional staff lines are unfilled. The staff information appear son the CISE website [CISE-staff].

## **ECE Staffing**

The ECE Department has a total of 35 staff positions: 10 administrative staff positions, and 25 technical staff positions. These include full-time positions to manage several computer and electrical equipment hardware laboratories. These positions appear on the ECE webpage [ECE-staff].

## D. Faculty Hiring and Retention

Each Department actively engages in comprehensive recruiting efforts of new faculty each year. Faculty positions are advertised nationally, and a Department committee ranks the candidates and makes recommendations to the Chair for interview invitations. Faculty interviews typically last two days, during which prospective faculty meet with most of the faculty in the Department, as well as the Dean of the College. Faculty meet to discuss the candidates, and the Chair makes offers in consultation with the Dean of the College. These recruiting efforts have been very successful in recent years.

New faculty usually join a group of established colleagues, and a mentor is informally assigned to them, usually a senior faculty member who works in the same research area. These mentorships are meant to guide young faculty through their tenure-track years, helping them become better teachers and researchers.

## E. Support of Faculty Professional Development

Support is very good for faculty professional development. Sabbaticals are awarded by the University, via recommendation by the College. Faculty are eligible for a sabbatical after six years of service. Traditionally, there have been two types of sabbaticals: one semester with full-pay, or two-semesters with half-pay. Recently, UF added a new type of sabbatical, with full pay for two semesters. UF has committed to awarding a minimum of 50 such sabbaticals per year. Sabbatical policies are listed on UF's Academic Personnel website [UF-sabbaticals]. In addition, UF offers the Faculty Enhancement

Opportunity (FEO) program, with monetary awards for creative and flexible faculty development projects, including educational experiences/conferneces, work with consultants/experts, and release time for intensive writing or creative work. The FEO program is administered by the Provost's office [FEO].

# **PROGRAM CRITERIA**

ABET program criteria for Electrical, Computer, and similar named Engineering programs are listed below in italics:

## **Curriculum:**

• The structure of the curriculum must provide both breadth and depth across the range of engineering topics implied by the title of the program.

As discussed in Criterion 5: Curriculum, our range of required and elective courses satisfies this requirement.

• The curriculum must include probability and statistics, including applications appropriate to the program name; mathematics through differential and integral calculus; sciences (defined as biological, chemical, or physical science); and engineering topics (including computing science) necessary to analyze and design complex electrical and electronic devices, software, and systems containing hardware and software components.

As discussed in Criterion 5: Curriculum, all of the above coursework is required in the Computer Engineering program.

• The curriculum for programs containing the modifier "electrical" in the title must include advanced mathematics, such as differential equations, linear algebra, complex variables, and discrete mathematics.

Although the modifier "electrical" is not included in the title of our program, the hardware track of the Computer Engineering has much in common with the discipline of Electrical Engineering. The program requires, as discussed in Criterion 5: Curriculum, advanced mathematics, specifically differential equations and discrete mathematics.

• The curriculum for programs containing the modifier "computer" in the title must include discrete mathematics.

As discussed in Criterion 5: Curriculum, the required course COT-3100 Discrete Structures, covers this topic.

# APPENDICES

# Appendix A1 – Course Syllabi (CISE courses)

- CEN 3031 Introduction to Software Engineering
- CGS 3065 Legal and Social Issues in Computing
- COT 3100 Applications of Discrete Structures
- CDA 3101 Introduction to Computer Organization
- COP 3229 Computer Programming Using C++
- COP 3275 Computer Programming Using C
- COP 3502 Programming Fundamentals for CIS Majors 1
- COP 3503 Programming Fundamentals for CIS Majors 2
- COP 3504 Advanced Programming Fundamentals for CIS Majors (formerly CIS 3020)
- COP 3530 Data Structures and Algorithms
- CNT 4007C Computer Network Fundamentals (formerly CEN 4500C)
- COP 4020 Programming Language Concepts
- CAP 4053 Artificial Intelligence for Computer Games
- CEN 4072 Software Testing and Verification
- CDA 4102 Computer Architecture
- CIS 4301 Information and Database Systems 1
- COP 4331 Object-oriented Programming
- COP 4343 UNIX System Administration
- CAP 4403 Introduction to Aesthetic Computing
- CAP 4410 Digital Image Processing
- COT 4501 Numerical Analysis-A Computational Approach
- COP 4600 Operating Systems
- COP 4620 Translators and Translator Writing Systems
- CAP 4621 Artificial Intelligence and Heuristics
- CAP 4680 Knowledge-Based System: Theory and Practice
- CAP 4730 Computational Structures in Computer Graphics
- CAP 4800 Systems Simulation
- CIS 4905 Individual Study in CISE
- CIS 4912C Integrated Product and Process Design 1
- CIS 4913C Integrated Product and Process Design 2
- CIS 4914 Senior Project (also listed as CEN 4914)
- CIS 4930 Special Topics in CISE
- CIS 4940 Practical Work
- CIS 4949 Co-Op Work in CISE
- CIS 4956 Overseas Studies 1

## Course Number & Name: CEN 3031 Introduction to Software Engineering

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Manuel Bermudez

**Textbook Title, Author, and Year:** *Software Engineering*, 8th Edition, Ian Sommerville, 2006, Addison Wesley.

### a. Supplemental Material: None

## **Specific Course Information**

**a.** Catalog Description: Topics include software planning, specifications, coding, testing and maintenance. Students gain experience in the team approach to large system development.

b. Prerequisites: COP 3530

c. Required, Elective, or Selected Elective: Required

## **Specific Goals for the Course**

**a. Specific Outcomes of Instruction:** The primary goal of this course is to introduce students to the principles of software engineering. We will cover software planning, specifications, coding, testing, and maintenance. Group projects will enhance team skills and approaches to large system development.

**b. Student outcomes addressed by the course:** d, g

- Communication
- Introduction to the complete software life cycle
- Requirements Engineering
- XP, Story Cards
- SDP Models
- Presentation skills
- Iteration I Presentation
- Design Models
- Software Development
- Testing
- Management
- Iteration II Presentation

## Course Number & Name: CGS 3065 Legal and Social Issues in Computing

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Gerald Haskins

**Textbook Title, Author, and Year:** published articles in a course pack & on-line references **a. Supplemental Material:** none

#### **Specific Course Information**

**a. Catalog Description:** This course explores the history, the myth, the ethics, the law and the risks of computer-based technology in modern society. Emphasis will be placed on critical analysis of hypotheticals and case studies. Published material will be supplemented with on-line Internet references.

**b. Prerequisites:** previous experience in Unix environment

**c. Required, Elective, or Selected Elective:** students must take either this course or EGN 4034 Professional Issues in Engineering (1 credit).

## **Specific Goals for the Course**

**a.** Specific Outcomes of Instruction: Students will understand how legal and social issues impact the domain of computing.

b. Student outcomes addressed by the course: f, h, i, j

- First Amendment Law
- Computer Misuse & Vulnerability
- Ethics in the Computer
- Computer Crime
- Computers and the Media
- The Oz Syndrome
- Information & Economics
- Risks of Overreliance
- Hacking and Viruses
- Blogging and Politics
- Censorship & Free Speech
- Online Indecency
- Electronic Privacy
- Homeland Insecurity
- Games with a Message
- Internet Politics
- Computer Contracts
- Intellectual Property
- Noxious Speech and Hate Groups

## **Course Number & Name: COT 3100 Applications of Discrete Structures**

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Timothy A. Davis

**Textbook Title, Author, and Year:** *Discrete Mathematics and its Applications*, Rosen, 7th Edition, McGraw-Hill, 2012.

a. Supplemental Material: None

## **Specific Course Information**

**a.** Catalog Description: Covers the mathematics of discrete events; i.e., events that involve distinct elements, finite structures of distinct elements or finite sampled versions of continuous phenomena (such as movement).

**b. Prerequisites:** MAC 2233, MAC 2311 or MAC 3472; Coreq: COP 3504 or COP 3503.

c. Required, Elective, or Selected Elective: Required

## Specific Goals for the Course

a. Specific Outcomes of Instruction: This course teache the fundamentals of logic, proof techniques, induction/recursion, counting, advanced, relations, and graph theory. These mathematical tools are essential to doing and understanding Computer Science / Computer Engineering. The primary emphasis of the course is mathematical reasoning and problem solving. Equipping the student with specific skills (such as tools for solving recurrence relations) is important, but only a secondary goal of this course.
b. Student outcomes addressed by the course: a, k

- Logic and proofs (logic, predicates and quatifiers, rules of inference, proofs, proof methods and strategy)
- Basic Structures: sets, functions, sequences, sums, cardinality and matrices.
- Algorithms, asymptotic notation, complexit of algorithms
- Number theory and cryptography: divisibility, modular arithmetic, primes, GCD
- Induction and Recursion: induction, recursive definitions, recursive algorithms
- Counting: basics, pigeonhole principle, permutations and combinations
- Discrete Probability
- Advanced Counting Techniques: applications of recurrence relations, divide-and-conquer
- Relations: properties, representation, equivalence relations
- Graphs: terminology, types of graphs, graph models, connectivity
- Trees

## Course Number & Name: CDA 3101 Introduction to Computer Organization

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Prabhat Mishra

Textbook Title, Author, and Year: Computer Organization and Design - The Hardware / Software Interface, 4th Edition, D. Patterson, J. L. Hennessy, Morgan Kaufmann 2009.
a. Supplemental Material: None

#### **Specific Course Information**

**a.** Catalog Description: Organization of computing systems. Logical basis of computer structure. Machine representation of instructions and data, flow of control, and basic machine instructions. Assembly language programming.

**b. Prerequisites:** COP 3504 or COP 3503; MAC 2233, MAC 2311 or MAC 3472.

c. Required, Elective, or Selected Elective: Required

## **Specific Goals for the Course**

**a. Specific Outcomes of Instruction:** This introductory course emphasizes essential concepts, the logical basis of computer structure, machine representation of instructions and data, flow of control, basic machine instructions, and assembly language programming. Students will be taught these basic concepts, and there will be exercises that help the student to learn the basics of assembly language programming. We also cover pipelined, parallel, and multicore architectures, to acquaint students with these architectures, the basics of how they function, and what practical problems are associated with these architectures. This is not an advanced course in computer architecture.

**b. Student outcomes addressed by the course:** a, c, e

- Introduction and Course Overview
- MIPS Assembly Language
- Arithmetic for Computers
- The Processor: Datapath, Control and Pipelining
- Memory Hierarchy
- Storage Systems
- Multiprocessors and Multicore Architectures
- Functional Validation of Computer Organization

Course Number & Name: COP 3229 Computer Programming Using C++

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Steve Thebaut

**Textbook Title, Author, and Year:** *The* C++ *Programming Language: Special Edition*, Bjarne Stroustrup, 2000

a. Supplemental Material: None

#### **Specific Course Information**

**a.** Catalog Description: In-depth treatment of the C++ programming language and an introduction to Windows programming using Visual C++.

**b. Prereq**: COP 3504 or COP 3503.

**c. Required, Elective, or Selected Elective:** Elective. At most 3 credits of any programming language course may count towards the Computer Engineering degree (COP 3229 and COP 3275).

#### **Specific Goals for the Course**

a. Specific Outcomes of Instruction: Through this course, students should be able to write, read, and understand computer programs using the C++ programming language. Students should also gain sufficient understanding of computer systems and programming concepts to be prepared to learn what is needed tackle future programming challenges. Students are equipped with the basics of object-oriented programming.
b. Student outcomes addressed by the course: k.

- Abstract classes as interfaces
- Class hierarchies for object-oriented programming
- Templates as the basis for type-safe generic software
- Exceptions for regular error handling
- Namespaces for modularity in large-scale software
- Run-time type identification for loosely coupled systems
- The C subset of C++ for C compatibility and system-level work
- Standard containers and algorithms
- Standard strings, I/O streams, and numerics
- C compatibility, internationalization, and exception safety

# Course Number & Name: COP 3275 Computer Programming Using C

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Taylor Glenn

**Textbook Title, Author, and Year:** *Absolute Beginner's Guide to C*, 2<sup>nd</sup> Ed. Greg Perry, 1994; Programming in C, 3<sup>rd</sup> Ed., Stephen G. Kochan, 2005

## a. Supplemental Material: None

## **Specific Course Information**

**a.** Catalog Description: Course solves problems related to a variety of disciplines and introduces students to the basic concepts of software and hardware.

**b. Prerequisites:** MAC 1147 or equivalent.

**c. Required, Elective, or Selected Elective:** Elective. At most 3 credits of any programming language course may count towards the Computer Engineering degree (COP 3229 and COP 3275).

## **Specific Goals for the Course**

**a. Specific Outcomes of Instruction:** Through this course, students should be able to write, read, and understand computer programs using the C programming language. Students should also gain sufficient understanding of computer systems and programming concepts to be prepared to learn what is needed tackle future programming challenges.

**b.** Student outcomes addressed by the course: k.

- Compiling and Running Programs
- Variables, Data Types, and Arithmetic Expressions
- Looping
- If statements
- Arrays
- Functions
- Structures
- Strings
- Pointers
- Recursion and the Program Stack
- The Preprocessor
- Program Structure and Multiple C Files
- Bits, Bytes, and Numbering Systems

Course Number & Name: COP 3502 Programming Fundamentals for CIS Majors 1

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Rong Zhang

**Textbook Title, Author, and Year:** *Introduction to Java Programming*, Y. Daniel Liang, Prentice Hall; 8th edition, 2010

a. Supplemental Material: None

## **Specific Course Information**

**a. Catalog Description:** First course in a 2-semester introductory sequence for students with no prior programming experience. Explores major concepts of Computer Science and the process of computer programming, including object-oriented programming, procedural and data abstraction and program modularity.

b. Prerequisites: Corequisite: MAC 2311.

**c. Required, Elective, or Selected Elective:** COP 3502 and 3503 are an optional twosemester pair of courses that together fulfil the requirement satistifed by the one-semester COP 3504.

## **Specific Goals for the Course**

**a. Specific Outcomes of Instruction:** The students are expected to develop an ability to identify, formulate, and solve the hardware and software Computer Engineering problems, accounting for the interaction between hardware and software.

b. Student outcomes addressed by the course:  $c,\,e,\,k$ 

- Understand what programming is and the unique feature of Java
- Read: Understand programs written in JAVA language
- Write: Design and implement programs using JAVA language
- Compile: Use compiler to convert JAVA code into executable file
- Execute: Run corresponding code to get results
- Debug: Identify and fix syntax and semantic errors in JAVA code.

## Course Number & Name: COP 3503 Programming Fundamentals for CIS Majors 2

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Rong Zhang

**Textbook Title, Author, and Year:** *Introduction to Java Programming, Comprehensive Version*, 8<sup>th</sup> Edition, Y. D. Liang, 2010.

a. Supplemental Material: None

#### **Specific Course Information**

**a. Catalog Description:** The second course in the introductory sequence for students with no prior programming experience. Explores major concepts of Computer Science and computer programming processes, including object-oriented programming, procedural and data abstraction and program modularity.

b. Prerequisites: COP 3502 and MAC 2311.

**c. Required, Elective, or Selected Elective:** COP 3502 and 3503 are an optional twosemester pair of courses that together fulfil the requirement satistifed by the one-semester COP 3504.

## **Specific Goals for the Course**

**a.** Specific Outcomes of Instruction: COP 3503 is the second course of a two-semester introductory sequence for students without prior programming experience. It builds up on COP 3502 (previously CIS 3022), and further explores Object-Oriented Programming using Java as the programming language. Concepts such as inheritance, abstract classes, interfaces, etc. will be introduced. Furthermore basic algorithms and data structures will be discussed, which are useful in solving problems. By the end of the course students will have a solid foundation for more advanced courses, and they will be able to start producing complex and useful programs.

**b.** Student outcomes addressed by the course: c, e, k

- Object-Oriented Programming (Objects and Classes)
- Inheritance and Polymorphism
- Abstract Classes and Interfaces
- Exception Handling
- File I/O
- Recursion
- Algorithms: Searching and Sorting
- Data Structures: Lists, Stacks, Queues
- Graphical User Interfaces (GUIs)

## Course Number & Name: COP 3504 Adv. Programming Fundamentals for CIS Majors (Formerly CIS 3020)

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each; 2 hours lab per week

Course Coordinator's Name: Dr. Douglas D Dankel II

**Textbook Title, Author, and Year:** *Java in a Nutshell* (5<sup>th</sup> Edition), David Flanagan, O'Reilly Press, 2005.

**a.** Supplemental Material: *The Object-Oriented Thought Process*, 3<sup>rd</sup> Edition, Matt Weisfeld, Addison-Wesley, 2009; *An Introduction to Programming and Object-Oriented Design Using Java*, J. Nino and F. A. Hosch, John Wiley, 2008 (Recommended)

#### **Specific Course Information**

**a. Catalog Description:** A fast-paced introduction to Computer Science for students with prior programming experience. Explores major concepts of Computer Science and the process of computer programming, including object-oriented programming, procedural and data abstraction and program modularity.

b. Prerequisites: MAC 2311 or MAC 3472, programming experience

**c. Required, Elective, or Selected Elective:** Required (or students may take the pair of courses COP 3502 and 3503)

#### **Specific Goals for the Course**

**a.** Specific Outcomes of Instruction: Students obtain an understanding of (1) objectoriented programming, (2) procedural abstraction, (3) data abstraction, and (4) program modularity and state information. They learn proper techniques for developing, testing, and documenting code.

b. Student outcomes addressed by the course:  $c,\,e,\,k$ 

- Basic concepts of object-oriented programming (abstraction, polymorphism, inheritance, encapsulation)
- Abstraction and specification (procedural, data, and control flow)
- UML and use cases
- Writing, understanding, and reasoning about code
- Program design and documentation
- The software life cycle (waterfall and agile), testing, debugging and defensive programming; recursion (linear, tree, tail and non-tail)
- Introduction to big O notation
- Basic search algorithms (linear and binary) and sorting methods (selection, bubble, quick, heap)
- Importance of user interface design

## Course Number & Name: COP 3530 Data Structures and Algorithms

Credits and Contact Hours: 4 crs; 4 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Manuel E. Bermudez

**Textbook Title, Author, and Year:** *Data Structures, Algorithms, and Applications in* C++, 2nd Edition, by Sartaj Sahni, 2004.

a. Supplemental Material: None

# **Specific Course Information**

**a. Catalog Description:** Algorithm development using pseudo languages, basic program structures, program design techniques, storage and manipulation of basic data structures like arrays, stacks, queues, sorting and searching and string processing. Linked linear lists. Trees and multilinked structures.

**b. Prerequisites:** COP 3504 or COP 3503, with C or better grade, COT 3100 and MAC 2234, MAC 2312, MAC 3473 or MAC 3512.

c. Required, Elective, or Selected Elective: Required

# **Specific Goals for the Course**

**a. Specific Outcomes of Instruction:** To learn how the choice of data structures and algorithm design methods impacts the performance of programs. To learn object-oriented design principles. To study specific data structures such as linear lists, stacks, queues, hash tables, binary trees, heaps, tournament trees, binary search trees, and graphs. To study specific algorithm design methods such as the greedy method, divide and conquer, dynamic programming, backtracking, and branch and bound. To gain experience writing programs in C++.

b. Student outcomes addressed by the course:  $a,\,e,\,k$ 

- Insertion sort and practical complexities. Run-time measurement.
- Linear lists. Array representation, array resizing. ArrayLinearList class.
- Iterators. Linked representation of a linear list.
- Chain class. Head nodes, circular lists, and doubly linked lists.
- Simulated pointers and available-space lists.
- Row-major, column-major indexing, special matrices. Sparse matrices.
- Stacks--application to parentheses matching, towers-of-hanoi, railroad car rearrangement, and switchbox routing; array stacks.
- Array and linked stacks. Nonapplicability of queues for parentheses matching, towers-ofhanoi, railroad problem with LIFO tracks, and switchbox routing. Application of queues to railroad problem with FIFO tracks, wire routing, and component labeling. Array and linked queues.
- Dictionaries, linear list representation. Hashing and hash table design.
- LZW compression.

- Trees, binary trees, and properties. Binary tree representation and operations. Binary tree traversal methods-- preorder, inorder, postorder, level order. Reconstruction from two orders.
- Online equivalence classes.
- Application of priority queues to heap sort and machine scheduling. Min and max heaps. Initialization of min and max heaps. Height- and weight-biased leftist trees.
- Winner and loser trees and application to k-way merging, run generation, and first-fit bin packing. Binary search trees and indexed binary search trees. AVL trees.
- Graph applications and properties. Graph operations and representation.
- Breadth-first and depth-first search. Application to path finding, connected components, and spanning trees.
- Greedy method. Application to bin packing/loading, knapsack problems.
- Single source all destinations shortest paths algorithm.
- Kruskal's and Prim's minimum-cost spanning tree algorithms.
- Divide and conquer, and application to defective chessboard and min-max problem. Iterative min-max implementation.
- Merge sort, natural merge sort, and quick sort.
- Selection and closest pair of points.
- Dynamic programming, 0/1 knapsack problem, recursive and iterative solutions.
- Matrix multiplication chains, dynamic programming recursive recurrence.
- Iterative solution to matrix multiplication chains.
- All pairs shortest paths. Single source shortest paths, with negative edge weights.
- Solution space trees and backtracking.
- Branch and bound.

Course Number & Name: CNT 4007C Computer Network Fundamentals (Formerly CEN 4500C)

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Jonathan Liu

**Textbook Title, Author, and Year:** *Computer Networking: A Top-Down Approach Featuring the Internet*, by J. Kurose and K. Ross, Fourth Edition, Addison Wesley, 2008.

#### a. Supplemental Material: None

#### **Specific Course Information**

**a. Catalog Description:** The fundamental concepts, principles and standards of computer networks. Topics will be introduced in bottom-up approach, starting from physical layer in OSI system architecture with a stronger focus on data link, mac, network and transport layers.

**b.** Prerequisites: COP 3530, CDA 3101 and COP 4600

**c. Required, Elective, or Selected Elective:** Required for CISE students (CEN), elective for ECE (CEE) students.

#### **Specific Goals for the Course**

**a. Specific Outcomes of Instruction:** This course covers problems in design and analysis of computer networks. While some effort focuses on the low-level protocols, most of the course is devoted to higher level protocols at the medium access, network and transport layers.

**b. Student outcomes addressed by the course:** b, k

- Introduction
- The Application Layer
- The Transport Layer
- The Network Layer
- The Data Link Layer

## Course Number & Name: COP 4020 Programming Language Concepts

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Joseph N Wilson

**Textbook Title, Author, and Year:** *Programming Language Pragmatics*, Third Edition, Michael Scott, Publisher: Morgan Kaufmann, 2008.

**a.** Supplemental Material: *Programming for the Java™ Virtual Machine*, Joshua Engelm Addison-Wesley Professional, 1999 (Recommended)

## **Specific Course Information**

**a.** Catalog Description: An introduction to programming language principles, including language constructs, design goals, run-time structures, implementation techniques and exposure to a wide variety of programming paradigms.

- b. Prerequisites: COP 3530
- c. Required, Elective, or Selected Elective: Elective

## **Specific Goals for the Course**

**a. Specific Outcomes of Instruction:** Provide students with an thorough understanding of the underlying concepts of programming languages (demonstrated by the ability to answer questions and work problems in class and answer examination questions) as well as a practical knowledge of implementation techniques (demonstrated by implementating a small Turing-complete programming language).

**b. Student outcomes addressed by the course:** a, c, k

- Programming Language Syntax
- Names, Scopes, Bindings
- Semantic Analysis
- Target Machine Architecture
- Core Issues in Language Design
- Control Flow
- Data Types
- Subroutines and Control Abstraction
- Data Abstraction and Object Orientation
- Alternative Programming Models
- Functional Languages
- Logic Languages
- Concurrency
- Scripting Languages
- A Closer Look at Implementation
- Building a Runnable Program
- Run-time Program Management
- Code Improvement

Course Number & Name: CAP 4053 Artificial Intelligence for Computer Games

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Douglas D Dankel II

**Textbook Title, Author, and Year:** *Artificial Intelligence for Games*, by Ian Millington, Morgan Kaufmann, 2006. *AI for Game Developers*, David Bourg and Glenn Seemann, O'Reilly, 2004.

a. Supplemental Material: None

## **Specific Course Information**

**a.** Catalog Description: An examination of the use of A.I. in computer games. Topics include general A.I. knowledge, path finding, movement, tactics and planning, strategy, state machines, learning, dialogue, and emotions.

- b. Prerequisites: COP 3530
- c. Required, Elective, or Selected Elective: Elective

#### **Specific Goals for the Course**

**a. Specific Outcomes of Instruction:** This course presents an examination of the use of artificial intelligence in computer games. Topics to be covered include general AI knowledge, path finding, movement, tactics and planning, strategy, state machines, learning, dialogue, and emotions. The course will be taught as a seminar/project class. All students will make three presentations on the various course topics and everyone will be involved in the group development of a game. Each student will be involved in the group development of a game. The domain of the project will be discussed in a later handout. The completed project will be due on the last day of class. Periodic deadlines involving the creation of some portion of the project and written reports will be specified in this later handout.

**b. Student outcomes addressed by the course:** a, c, d, g, h, k

- A\*
- Command Hierarchy
- Dead Reckoning
- Emergent Behavior
- Flocking
- Formations
- Influence Mapping
- Level-of-Detail AI
- Manager Task Assignment
- Obstacle Avoidance
- Scripting
- State Machines
- Stack-based State Machines

- Subsumption Architecture
- Terrain Analysis
- Trigger System
- Bayesian Networks
- Blackboard Architecture
- Decision Tree Learning
- Filtered Randomness
- Fuzzy Logic
- Genetic Algorithms
- N-Gram Statistical Prediction
- Neural Nets & Perceptions
- Planning, Player Modeling
- Production Systems
- Reinforcement Learning
- Reputation System
- Smart Terrain
- Weakness Modification Learning
- Emotions

## Course Number & Name: CEN 4072 Software Testing and Verification

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Steve Thebaut

**Textbook Title, Author, and Year:** *Software Testing & Analysis,* Pezze & Young, 2008. **a. Supplemental Material:** required readings in a course packet

## **Specific Course Information**

**a.** Catalog Description: Concepts, principles and techniques of software testing and verification. Strengths and limitations of black-box and white-box testing methods; techniques for proving the correctness of programs.

b. Prerequisites: CEN 3031

c. Required, Elective, or Selected Elective: Elective

## Specific Goals for the Course

**a.** Specific Outcomes of Instruction: Software Testing and Verification is a survey course on concepts, principles, and techniques related to software testing and formal program verification. Students will become acquainted with both the strengths and limitations of various functional and structural testing methods, as well as techniques for proving the functional correctness of sequential programs. Topics include: black-box and white-box test case design strategies, incremental integration testing techniques, inspections and reviews, axiomatic verification, predicate transforms, and function-theoretic verification.

**b. Student outcomes addressed by the course:** a, b, c, e, k

- Intro to V&V Techniques and Principles
- Requirements and Specifications
- Black-Box Test Case Design Strategies: Partition Testing, Combinatorial Approaches
- White-Box Test Case Design Strategies: Logic & Dataflow Coverage, Path Conditions and Symbolic Evaluation
- Integration and Higher Level Testing
- Testing Object-Oriented Software
- Reviews and Inspections
- Testing Tools
- Formal Program Specification
- Axiomatic Verification: Weak Correctness, Rules of Inference, Strong correctness
- Predicate Transforms: Proving Strong Correctness, Computing Weakest Pre-conditions
- Functional Verification: Complete and Sufficient Correctness, Axiom of Replacement, Correctness Conditions, Iteration Recursion Lemma, Revisiting Loop Invariants
- Cleanroom Software Engineering

## Course Number & Name: CDA 4102 Computer Architecture

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Jih-Kwon Peir

**Textbook Title, Author, and Year:** *Computer Architecture: A Quantitative Approach,* 4th Edition, John L. Hennessy, David Patterson, 2007.

**a. Supplemental Material:** *Computer Organization and Design*, 4th Ed. David A. Patterson, John L. Hennessy, 2009 (Recommended)

#### **Specific Course Information**

**a.** Catalog Description: Introduction to computer architecture and system organization including virtual memory supports cache, pipeline, vector processing, multiprocessor and RISC architecture.

b. Prerequisites: CDA 3101 and COP 3530.

c. Required, Elective, or Selected Elective: Elective

#### **Specific Goals for the Course**

**a. Specific Outcomes of Instruction:** This course teaches students fundamental knowledge in Computer Architecture and Microarchitecture. The course covers the basic organizations of computer systems including instruction-set architecture, execution pipeline, memory hierarchy, and I/O subsystem. It also addresses advanced processor microarchitecture issues such as dynamic instruction scheduling, branch prediction, lock-up free caches, instruction-level parallelism, multiple instruction fetch/issuing, speculative execution, etc. to improve computer processor performance. Shared-memory multiprocessor systems with coherent caches to reduce memory access latency, the virtual machine concept and virtual machine monitor are also covered. Term projects will be assigned to study issues of high-performance processors.

**b.** Student outcomes addressed by the course: c, k

- ISA Basics
- Pipeline basics
- ILP exploitation
- Limit ILP
- Cache basics
- Multiprocessor and TLP
- Memory
- Storage

#### Course Number & Name: CIS 4301 Information and Database Systems 1

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. 'Daisy' Zhe Wang

**Textbook Title, Author, and Year:** *Database Systems: The Complete Book*, Second Edition, by Hector Garcia-Molina, Jeffrey Ullman and Jennifer Widom, 2008

**a. Supplemental Material:** *Oracle 10g Programming: A Primer*, by R. Sunderraman, 2007 (Recommended)

#### **Specific Course Information**

**a. Catalog Description:** The first part of a two-course sequence that studies the essential concepts, principles & techniques of modern database systems. Topics include modeling and querying of data using conceptual data models as well as the development of a database application.

**b. Prerequisites:** COP 3504 or COP 3503 and COT 3100

c. Required, Elective, or Selected Elective: Elective

#### **Specific Goals for the Course**

**a.** Specific Outcomes of Instruction: This course is the first in a two-course sequence that serves as an introduction to modern database systems. This first course provides an in-depth view of databases from a sophisticated user's perspective. Essentially, when you are done with this class you will know the right way to design and implement software that uses a database as a back end to store and manage data. Even if you think that you know the right way to do this because you have played with MySQL previously, the simple fact is that you probably do not know the right way. We will not cover database internals or how to tweak them in order to get them to run fast; that is the topic of the next course in the sequence.

From a theoretical point of view, this course covers the essential principles for the design, analysis, and use of computerized database systems. The design and techniques of conceptual modeling, database modeling, database system architecture, and user/program interfaces are presented in a unified way.

From a practical point of view, students learn to deal with a commercial database system (Oracle). They learn how to apply theoretically understood concepts in a professional database environment. For example, they practice how to formulate ad hoc queries or how to write application programs in a database context. They also learn the complete process from devising a conceptual database design up to its transformation into the database schema of a concrete database management system.

By providing a balanced view of "theory" and "practice", the material covered should allow the student to understand and use practical database systems. The student is provided with a basic understanding of the issues and problems involved in database system development, a knowledge of currently practical techniques for satisfying the needs of a database system, and an indication of the current research approaches that are likely to provide a basis for tomorrow's systems.

**b.** Student outcomes addressed by the course: a, b, c, e, k

- The ER model
- Conceptual database design and modeling
- The relational model
- Relational query languages (relational algebra, relational calculus, and SQL)
- Logical database design (functional dependencies and normal forms)
- Object-relational databases and SQL-3

## Course Number & Name: COP 4331 Object-oriented Programming

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Joseph N Wilson

**Textbook Title, Author, and Year:** *Fundamentals of Object-Oriented Design in UML*, Meilir Page-Jones (Addison-Wesley/Dorset House, 2000).

**a.** Supplemental Material: *Design Patterns: Elements of Reusable Object-Oriented Software*, Erich Gamma, Richard Helm, Ralph Johnson, & John Vlissides (Addison-Wesley, 1994) (optional)

# **Specific Course Information**

**a. Catalog Description:** Fundamental conceptual models for programming languages illustrated with specific programming languages and application problems. Specific topics include class and object models, inheritance among classes, objects and static and dynamic systems and implementations.

**b. Prerequisites:** COP 3530.

c. Required, Elective, or Selected Elective: Elective

# **Specific Goals for the Course**

**a. Specific Outcomes of Instruction:** This course discusses fundamental conceptual models for object-oriented programming and illustrates these with Java language and application problems. We will be covering object-oriented terminology extensively while emphasising the practical importance of the concepts. Students will be responsible for reading the required textbook, creating presentations for the challenges, and working on a significant and non-trivial team-programming project to gain familiarity with object-oriented analysis, design, and implementation.

b. Student outcomes addressed by the course:  $c,\,e,\,k$ 

- Learning fundamentals of object-oriented design
- Building a working knowledge of object-oriented programming
- Getting familiar with UML terminology: learn how to incorporate UML in design
- Understanding how to design and implement well built class hierarchies
- Being able to evaluate classes and hierarchies
- Differentiating between object oriented programming and other paradigms

## Course Number & Name: COP 4343 UNIX System Administration

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Joseph N Wilson

**Textbook Title, Author, and Year:** *Linux Administration Handbook*, E. Nemeth, G. Snyder, T.R. Hein, Prentice Hall, 2001

a. Supplemental Material: None

#### **Specific Course Information**

**a. Catalog Description:** A study of the underlying concepts and techniques employed in the installation, administration and tuning of UNIX operating systems. Topics covered include operating system installation, simple network configuration, file backup and restore, account administration, device management, scheduling, file systems, network management, and basic system and network security.

b. Prerequisites: COP 4600

c. Required, Elective, or Selected Elective: Elective

#### **Specific Goals for the Course**

**a. Specific Outcomes of Instruction:** The Unix® System Administration course addresses the goal of teaching engineering science and design. The student is required to employ basic knowledge gained in other parts of the program to the task of effectively administering an operating system. Knowledge of specific data structures and programming techniques employed in the implementation of operating systems and utilities is exploited in solving problems assigned during the term. The Unix® System Administration course addresses several of the CISE Department's program objectives. The course provides a variety of information demonstrating

interactions between hardware and software. It provides ample opportunities to learn to analyze, design, and implement solutions to Computer Engineering problems. It also addresses a number of the ethical, legal, and social issues associated with the adminstration of computer systems and networks.

**b. Student outcomes addressed by the course:** e, k

- Operating system installation
- Simple network configuration
- File backup and restore
- Account administration
- Device management, scheduling
- File systems
- Network management
- Basic system and network security

## Course Number & Name: CAP 4403 Introduction to Aesthetic Computing

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Paul Fishwick

Textbook Title, Author, and Year: extensive class notes provided online a. Supplemental Material: None

## **Specific Course Information**

a. Catalog Description: Basic concepts of applying aesthetics to the representation of formal discrete structures found in computing, as well as to their operational behaviors.b. Prerequisites: COP 3530.

c. Required, Elective, or Selected Elective: Elective

## **Specific Goals for the Course**

**a.** Specific Outcomes of Instruction: This is a seminar class where we will investigate new ways of representing three types of formal language for a variety of end goals and users. We will also have invited lectures and media presentations related to the class topic.

**b.** Student outcomes addressed by the course: a, c, e

- Introduction to class: goals and objectives
- History of the class, past project examples
- Encyclopedia Chapter
- Team Talk
- Video
- Basic Method, Guide and Tutorial
- Technologies
- Futuristic interfaces: World Builder Microsoft Corning Heavy Rain
- Game Concepts
- Ethics and legal issues Terms of Service

## Course Number & Name: CAP 4410 Digital Image Processing

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Baba Vemuri

Textbook Title, Author, and Year: *Robot Vision*, by B. K. P. Horn, McGraw-Hill, 1986.
a. Supplemental Material: *Computer Vision: A Modern Approach*, Forsyth and Ponce, Prentice Hall 2002.

## **Specific Course Information**

**a.** Catalog Description: Survey of techniques used to replicate the human vision process in computer systems. Topics include image formation, image algebra, filtering, range extraction, edge and boundary detection, region growing, and model based vision.

**b. Prerequisites:** COP 3530 and MAC 2312, MAC 3473, or MAC 3512.

c. Required, Elective, or Selected Elective: Elective

## **Specific Goals for the Course**

**a.** Specific Outcomes of Instruction: Students learn the mathematics behind computer image processing and image recognition, and become familiar with a wide range of techniques in this domain.

**b. Student outcomes addressed by the course:** a, c, e, k

- Image Formation: Monocular imaging system; Orthographic & Perspective Projections; Camera model and Camera calibration; Binocular imaging systems; 3D image sensing (range sensing with laser ranging, grid coding etc.)
- Low-level Vision: Basic image processing (continuous and discrete images), Edges and edge finding, stereo vision, Regularization, Shape from X, Optic flow and its computation, Motion analysis (computation of motion parameters and structure).
- Shape Segmentation and Representation: Simple segmentation techniques in 2D and 3D: De- formable curves and surfaces a.k.a. "snakes" and associated numerical methods. Snakes for tracking and Kalman snakes. 2D (implicit and explicit functions, boundaries: Fourier/Wavelet descriptors; regions: Texture description using co-occurrence matrices, Medial axis, quadtrees etc.) and 3D shape representation (surface based: implicit and explicit functions, Gauss map and its differential; and volume based: Octrees, deformable solids etc.) techniques, Multi-resolution representations (Laplacian pyramid and wavelet basis).
- High-level Vision: Simple object recognition methods in 2D and 3D: Various criteria for image- image or shape-shape matching. Principal Component Analysis (PCA) and building priors for recognition.

Course Number & Name: COT 4501 Numerical Analysis-A Computational Approach

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Timothy A. Davis

**Textbook Title, Author, and Year:** *An Scientific Computing, An Introductory Survey* (3rd Edition), Michael T. Heath, McGraw-Hill 2012.

**a. Supplemental Material:** *MATLAB Primer*, 8<sup>th</sup> Edition, Timothy A. Davis, 2010 (optional)

#### **Specific Course Information**

**a.** Catalog Description: Numerical integration, nonlinear equations, linear & nonlinear systems of equations, differential equations and interpolation.

**b. Prerequisites:** COP 3504 or COP 3503 and MAS 3114.

**c. Required, Elective, or Selected Elective:** Required for CISE (CEN) students; elective for ECE (CEE) students.

#### **Specific Goals for the Course**

**a.** Specific Outcomes of Instruction: The objectives of this course is to enable students to master the theory and practice of numerical integration, nonlinear equations, linear and nonlinear systems of equations, differential equations, and interpolation, so that they can be used to solve real-world problems. Computational Science has become the third branch of science, along with theory and experimentation. One can't do an experiment on, say, the sun, and building a nuclear fusion experiment is rather costly and hard to do. Theory can only take you so far. Computational Science bridges the gap: it can simulate complex scenarios that rely on theory and can be validated by experiments, but are beyond the reach of both.

b. Student outcomes addressed by the course: a, b, e

- Scientific Computing: approximations, computer arithmetic, mathematical software
- Systems of Linear Equations: existence, uniqueness, sensitivity, direct & iterative solvers
- Linear Least Squares: existence, uniqueness, sensitivity, orthogonalization, SVD
- Eigenvalue Problems
- Nonlinear Equations: existence, uniqueness, sensitivity, convergence rates, nonlinear systems
- Optimization: existence, uniqueness, sensitivity, optimization in one direction
- Interpolation: existence, uniqueness, sensitivity, polynomial interpolation, splines
- Numerical Integration and Differentiation
- Initial Value Problems for Ordinary Differential Equations

## Course Number & Name: COP 4600 Operating Systems

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Richard Newman

**Textbook Title, Author, and Year:** *Operating Systems: Design and Implementation,* Tanenbaum and Woodhull, 2006, 3<sup>rd</sup> Edition

**a.** Supplemental Material: *Operating Systems Concepts*, Silverschatz, Galvin, and Gagen, 2009, 8<sup>th</sup> Edition; *The C Programming Language*, Kernighan & Ritchie, 1988, 2<sup>nd</sup> Edition (Recommended)

## **Specific Course Information**

**a. Catalog Description:** The design and implementation of various components of a modern operating system, including I/O programming, interrupt handling, process and resource management, computer networks and distributed systems.

**b. Prerequisites:** CDA 3101, COP 3530; knowledge of C or C++ recommended.

c. Required, Elective, or Selected Elective: Required

#### **Specific Goals for the Course**

**a.** Specific Outcomes of Instruction: Students will study the design & implementation of various components of a modern operating system. Topics include processor multiplexing, process and resource management, network and distributed operating system concepts. This is a course on the theory, design, and implementation of operating systems, *not* a course on how to merely use an operating system. Successful students will be able to discuss the four main components of operating system, design each of these, evaluate a given design vis-à-vis a particular purpose, and apply their knowledge of data structures, algorithms, performance analysis, and protocols to real-life problems in multi-threaded systems.

b. Student outcomes addressed by the course:  $\boldsymbol{c},\,\boldsymbol{k}$ 

- Processor multiplexing
- Process and resource management
- Network and distributed operating system concepts

## Course Number & Name: COP 4620 Translators and Translator Writing Systems

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Manuel Bermudez

**Textbook Title, Author, and Year:** *Compilers: Principles, Techniques and Tools*, Aho, Sethi, and Ullman, Addison-Wesley, 1986.

a. Supplemental Material: Compiler Construction, K. Louden, 1997/

#### **Specific Course Information**

a. Catalog Description: Translation of languages, scanning and parsing techniques.

Translator writing systems. The implementation of a compiler.

- b. Prerequisites: COP 3530
- c. Required, Elective, or Selected Elective: Elective

#### **Specific Goals for the Course**

a. Specific Outcomes of Instruction: This course covers the theory and practice of compiler-writing. The class discussions will parallel the project, in which students will extend (significantly) the implementation of a compiler for a subset of C.
b. Student outcomes addressed by the course: c, e, k

- Language theory
- Finite-state machines
- Lexical analysis
- Parsing
- Syntax-directed translation
- Contextual constraint management
- Code generation.

## Course Number & Name: CAP 4621 Artificial Intelligence and Heuristics

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Douglas D. Dankel II

**Textbook Title, Author, and Year:** *Artificial Intelligence Illuminated*, Ben Coppin, Jones and Bartlett, 2004

a. Supplemental Material: none

# **Specific Course Information**

**a.** Catalog Description: Introduction to artificial intelligence concepts. Heuristic search, clause form logic, knowledge representation, reasoning and inference, overview of computer vision, planning, natural language, Lisp and Prolog.

b. Prerequisites: COP 3530.

c. Required, Elective, or Selected Elective: Elective

# **Specific Goals for the Course**

**a. Specific Outcomes of Instruction:** This course presents an overview of Artificial Intelligence concentrating on the core concepts of problem solving, heuristic search, and knowledge representation. It is intended to give students an appreciation of how difficult it is to develop "intelligent" systems, what makes a system intelligent, and new problem solving techniques and methods.

**b. Student outcomes addressed by the course:** a, c, g, j, k

- What is intelligence, what is artificial intelligence?
- The Turing Test, strong vs. weak AI
- Searle's Chinese Room
- Problem solving and the classes of problems
- Knowledge representation (types of knowledge, using knowledge, semantic networks, frames, scripts, rules, state-space vs. problem reduction representations, OR and AND/OR trees)
- Forward vs. backward reasoning
- Blind search (British Museum Algorithm, generate and test, depth, breadth, depth-first iterative deeping)
- Heuristic search (ordered/best-first, admissibility, monotonicity, hill climbing, best-first, beam, uniform-cost, A\*, greedy, constraint satisfaction, bi-directional, island), game trees and search (minimax, alpha-beta)
- Various games (checkers, chess, Go, Gomaku, Othello, Backgammon)
- Logic (propositional, predicate, modal/non-monotonic, unification, deduction, abduction)
- Expert systems, learning (inductive, version spaces, inductive bias, Occam's Razor, overfitting, classical learning by Winston and Samuel)
- Computer vision (noise removal, enhancing, Guzman, Huffman-Clowes, Waltz)
- Natural language (production, understanding, grammars, SHRDLU, planner language)
- Inexact reasoning (Bayes, certainty factors, Denster-Shaffer)
# Course Number & Name: CAP 4680 Knowledge-Based System: Theory and Practice

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Douglas D. Dankel II

**Textbook Title, Author, and Year:** *Engineering Knowledge-Based Systems: Theory and Practice*, by Avelino Gonzalez and Douglas Dankel II, 1993. Under revision for a new version; provided online for students.

## a. Supplemental Material: None

#### **Specific Course Information**

**a. Catalog Description:** Concepts, theory and various applications for knowledge-based (expert) systems, reasoning schemes, knowledge representation, knowledge-based system tools, building knowledge bases, knowledge acquisition, reasoning under certainty and inexact reasoning.

- b. Prerequisites: CAP 4621
- c. Required, Elective, or Selected Elective: Elective

#### **Specific Goals for the Course**

a. Specific Outcomes of Instruction: This course provides students with an in-depth examination of expert or knowledge-based systems. The intent is for students to learn a unique and different problem solving approach – solving problems from a rule/event-driven perspective, to see how this technique can be applied to various problems, and to gain an understanding of problem solving with imprecise and inexact data.
b. Student outcomes addressed by the course: a, b, c, g, h, k

- Structure of knowledge-based systems
- Different user perspectives (end-user, developer, tool builder)
- CLIPS
- Prolog
- Logic (propositional, predicate)
- Rules representations and reasoning (forward, backward, bi-directional)
- Associate networks
- Frames
- Objects
- Blackboard architectures
- Inexact reasoning (Bayes, certainty factors, Denster-Shaffer)
- Knowledge-based systems lifecycle and how it differs from traditional software development

Course Number & Name: CAP 4730 Computational Structures in Computer Graphics

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Alireza Entezari

**Textbook Title, Author, and Year:** *Fundamentals of Computer Graphics*, Peter Shirley, 3rd Edition, AK Peters, 2009.

**a.** Supplemental Material: Opengl Programming Guide: The Official Guide to Learning Opengl, Mason Woo, Jackie Neider, Tom Davis, 1999 (Optional)

#### **Specific Course Information**

**a.** Catalog Description: A study of the major topics in computer graphics: display and output technology, two and three-dimensional manipulations; space curves and surfaces, hidden surface removal and shading models.

b. Prerequisites: COP 3530.

c. Required, Elective, or Selected Elective: Elective

## **Specific Goals for the Course**

a. Specific Outcomes of Instruction: An advanced course on the concepts and principles underlying *interactive gaming and graphics environments*. The goal is to build, not just use such environments, inluding the lighting and modeling of geometry. In particular, students are expected to work with, understand and modify OpenGL example programs. Students will also benefit from refreshing their knowledge of linear algebra and calculus to understand structures rather than just examples. Through several handson exercises students develop a thorough understanding of the *graphics pipeline* and more elaborate techniques in computer graphics. The emphasis is on basic concepts, mathematical principles, algorithms and data structures used in computer graphics.
b. Student outcomes addressed by the course: a, c, e, k

- Graphics Hardware
- Basic Linear Algebra
- Geometric Transformations
- Scene composition
- View Transformations
- Shading and Illumination
- Rendering
- Sampling and Reconstruction
- Modeling Curves and Surfaces
- Ray tracing
- Anti-aliasing and composition
- Color spaces
- Image Based Methods

## Course Number & Name: CAP 4800 Systems Simulation

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Paul Fishwick

# Textbook Title, Author, and Year: online materials a. Supplemental Material: none

#### **Specific Course Information**

**a. Catalog Description:** Simulation methodology and practice. Covers basic concepts in modeling and analysis for both continuous and discrete systems. Combined simulation methods including integrated qualitative/quantitative system modeling. Will use in-house simulation software.

b. Prerequisites: COP 3530

c. Required, Elective, or Selected Elective: Elective

## **Specific Goals for the Course**

a. Specific Outcomes of Instruction: The student will be able to explain how complex systems function through reference to dynamic systems models and simulation. The student will learn a modern language related to simulation. The current language is Ptolemy II, which is an open source agent-based package hosted at UC Berkeley.
b. Student outcomes addressed by the course: a, b, c, e, k

- Management of data and time
- System definition
- Finite state machine
- Markov models, Petri nets, Turing machines
- Rule-Based models
- Event-Based models
- Cellular automata
- Compartmental modeling, Functional block modeling
- System Dynamics method
- Digital logic circuits
- Queuing models
- Lindenmeyer systems
- Kinetic graphs
- Difference equations
- Ordinary and partial differential equations
- Delay-differential equations

# Course Number & Name: CIS 4905 Individual Study in CISE

Credits and Contact Hours: 1 to 4 crs; can be repeated with change in content up to 8 credits.

Course Coordinator's Name: Dr. Steve Thebaut

**Textbook Title, Author, and Year:** varies according to the topic **a. Supplemental Material:** varies

#### **Specific Course Information**

- a. Catalog Description: Problems in different areas of Computer Science.
- **b. Prerequisites:** Instructor permission
- c. Required, Elective, or Selected Elective: Elective

#### **Specific Goals for the Course**

**a.** Specific Outcomes of Instruction: One-on-one interaction between a faculty member and a student. Topics vary.

b. Student outcomes addressed by the course: varies

#### **Brief List of Topics to Be Covered**

• Varies

#### Course Number & Name: CIS 4912C Integrated Product and Process Design 1

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Keith Stanfill (ISE Department)

Textbook Title, Author, and Year: None

a. Supplemental Material: None

#### **Specific Course Information**

**a. Catalog Description:** The first part of a two-course sequence where teams of engineering and business students partner with industry sponsors to design and build authentic products and processes. Working closely with an industry liaison engineer and a faculty coach, students gain practical experience in teamwork and communication, problem solving and engineering design, and develop leadership, management and people skills. Weekly workshop activities adapt lecture topics to individual projects. Students learn firsthand how to develop products and processes that meet customer requirements on time and within budget.

b. Prerequisites: CDA 3101, COP 3530, COT 3100 and instructor permission.
c. Required, Elective, or Selected Elective: CISE students (CEN) must take either CIS 4914 Senior Design, or the pair of IPPD courses (CIS 4912C / 4913C). ECE students in the Computer Engineering program (CEE) take their departmental senior design / IPPD courses.

#### **Specific Goals for the Course**

**a. Specific Outcomes of Instruction:** The IPPD program provides both classroom and laboratory experience. Working in small multidisciplinary project teams, students get important practical experience in teamwork and communication and in developing their leadership, management and people skills. Advantages of integrating product and process design are well recognized by industry. Concurrent design of products and processes improves product costs and quality and reduces time-to-market. Students who have worked on real-life projects and know how to work in teams are more valuable as employees. They also recognize the importance of communication among different engineering and business disciplines.

**b. Student outcomes addressed by the course:** all outcomes a through k

- How fundamental engineering science is relevant to effective product and process design
- That design involves not just product function but also producibility, cost, schedule, reliability, quality, customer preferences and life cycle issues
- How to complete projects on time and within a budget
- That engineering is a multidisciplinary effort

## Course Number & Name: CIS 4913C Integrated Product and Process Design 2

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Dr. Keith Stanfill (ISE Department)

Textbook Title, Author, and Year: None

a. Supplemental Material: None

#### **Specific Course Information**

a. Catalog Description: The second part of the CIS 4912-4913 sequence.

**b. Prerequisites:** CIS 4912C

**c. Required, Elective, or Selected Elective:** CISE students (CEN) must take either CIS 4914 Senior Design, or the pair of IPPD courses (CIS 4912C / 4913C). ECE students in the Computer Engineering program (CEE) take their departmental senior design / IPPD courses.

#### **Specific Goals for the Course**

a. Specific Outcomes of Instruction: See CIS 4912C on previous page.

**b. Student outcomes addressed by the course:** all outcomes a through k

#### **Brief List of Topics to Be Covered**

• (See CIS 4912C on previous page for details)

## Course Number & Name: CIS 4914 Senior Project (also listed as CEN 4914)

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Tuba Yavuz-Kahveci

# Textbook Title, Author, and Year: none

a. Supplemental Material: none

## **Specific Course Information**

**a.** Catalog Description: Involves completing a significant CISE-related project. Student must coordinate with the instructor and a project adviser, prepare a detailed technical report and deliver an oral presentation.

**b. Prerequisites:** senior CISE standing and approved project proposal

**c. Required, Elective, or Selected Elective:** CISE students must take either CIS 4914 Senior Design, or the pair of IPPD courses (CIS 4912C / 4913C). ECE students in the Computer Engineering program take their departmental senior design / IPPD courses.

## Specific Goals for the Course

**a. Specific Outcomes of Instruction:** Students will apply their knowledge of Computer Science and/or Engineering to a semester long project and provide both written and oral forms of presentation of their project. Students will improve their presentation and communication skills to be effective and competent in a professional setting. Students will be prepared to take roles in engineering projects as successful engineers by applying the engineering techniques and methods that they have learned.

b. Student outcomes addressed by the course: all outcomes a through  $\boldsymbol{k}$ 

- Time management
- Project management
- Presentation skills

# Course Number & Name: CIS 4930 Special Topics in CISE

Credits and Contact Hours: 1 to 4 credits; 1 to 4 classes per week of 50 minutes each

Course Coordinator's Name: Dr. Steve Theabaut

#### **Textbook Title, Author, and Year:** varies **a. Supplemental Material:** varies

#### **Specific Course Information**

**a.** Catalog Description: Topics vary. Current topics of interest in area of Computer and Information Sciences.

**b.** Prerequisites:

c. Required, Elective, or Selected Elective: Elective

**Specific Goals for the Course** 

- a. Specific Outcomes of Instruction: varies
- b. Student outcomes addressed by the course: varies

#### **Brief List of Topics to Be Covered**

• Varies

## Course Number & Name: CIS 4940 Practical Work

Credits and Contact Hours: 1 credit; can be repeated for credit.

Course Coordinator's Name: Dr. Steve Thebaut

# Textbook Title, Author, and Year: none

a. Supplemental Material: none

#### **Specific Course Information**

**a.** Catalog Description: One term practical software engineering work under industrial supervision as set forth in the College of Engineering regulations.

- b. Prerequisites: none
- c. Required, Elective, or Selected Elective: Elective

#### **Specific Goals for the Course**

**a.** Specific Outcomes of Instruction: Students gain practical experience in putting their knowledge to work in an industrial environment.

b. Student outcomes addressed by the course:  $h,\,i,\,j$ 

#### **Brief List of Topics to Be Covered**

• Varies according to the industrial supervisor

## Course Number & Name: CIS 4949 Co-Op Work in CISE

Credits and Contact Hours: 1 credit.

Course Coordinator's Name: Dr. Steve Thebaut

Textbook Title, Author, and Year: none a. Supplemental Material: none

#### **Specific Course Information**

**a.** Catalog Description: Practical engineering work under industrial supervision, as set forth in the College of Engineering regulations.

- b. Prerequisites: none
- c. Required, Elective, or Selected Elective: Elective

#### **Specific Goals for the Course**

**a.** Specific Outcomes of Instruction: Students gain practical experience in putting their knowledge to work in an industrial environment.

b. Student outcomes addressed by the course:  $h,\,i,\,j$ 

#### **Brief List of Topics to Be Covered**

• Varies according to the industrial supervisor

## Course Number & Name: CIS 4956 Overseas Studies 1

Credits and Contact Hours: 1 to 15; can be repeated with change in topic up to 15 credits.

Course Coordinator's Name: Dr. Steve Thebaut

Textbook Title, Author, and Year: none a. Supplemental Material: none

#### **Specific Course Information**

**a.** Catalog Description: A mechanism for course work taken at a foreign university as part of an approved study abroad program. Credits taken under this will be transferred to UF and count toward graduation.

b. Prerequisites: Permission of undergraduate adviser.

c. Required, Elective, or Selected Elective: Elective

#### **Specific Goals for the Course**

- a. Specific Outcomes of Instruction: varies
- **b.** Student outcomes addressed by the course: h, i, j

**Brief List of Topics to Be Covered** 

• Varies

Appendix A2 – Course Syllabi (ECE courses)

- 1. Course number and name: EEE 3308C Electronic Circuits I (Formerly EEL 3304C)
- 2. Credits and contact hours: 3 crs; 3 classes of 50 minutes each and 1 laboratory section of 3 hours per week
- 3. Instructor's or course coordinator's name: Dr. Robert Fox
- **4.** Text book, title, author, and year: A.S. Sedra & K.C. Smith, *Microelectronic Circuits*, latest edition
  - a. other supplemental materials: None

- a. catalog description: Fundamentals of electronic circuits and systems. Laboratory
- b. prerequisites: EEL 3111 Circuits I
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Required for CEE students. CEN students may take EEE 3308C or EEL 3135.

## 6. Specific goals for the course

- a. specific outcomes of instruction: The student will be able to explain the basics of electronic components, circuits, and systems and will be able to design electronic circuits and systems to meet desired needs and specifications
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, b, c, e, g, i, k

- a. Operational Amplifiers Analysis, Circuits, Nonidealities
- b. Diode PN junction operation, Model, Circuits
- c. FET Operation, DC models, Biasing, AC model, Amplifiers, SPICE
- d. BJT Operation, models, Biasing, AC model, Amplifiers, SPICE
- e. IC Biasing Current sources, mirrors, steering, Single-Stage Amplifiers, Active loads, Cascade Amplifiers, SPICE
- f. Differential Amplifiers, Active Load, Frequency Response, Multistage Amplifiers, SPICE

- 1. Course number and name: EEE 3396 Solid-State Electronic Device
- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. Jing Guo
- **4.** Text book, title, author, and year: Streetman and Banerjee, *Solid State Electronic Devices*, Prentice Hall, latest edition
  - a. other supplemental materials:

- a. catalog description: Introduction to the principles of semiconductor electron device operation.
- b. prerequisites: EEL 3111 Circuits I
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Required for CEE students, elective for CEN.

## 6. Specific goals for the course

- a. specific outcomes of instruction: The student will understand the background on material physics of semiconductors and will be able to develop the fundamental semiconductor equations at equilibrium and non-equilibrium, and to apply these fundamental concepts to basic semiconductor devices in order to explain the device operation, electrical characteristics, and design semiconductor devices with specified operating parameters
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, c, e, k

- a. Semiconductor Materials; Crystal lattices and periodic structures, Wave motion of electrons in materials, Fermi energy level
- b. Carrier Transport; Drift and electron and hole mobilities, Diffusion in a concentration gradient, Generation, recombination, trapping, and tunneling
- c. MOS Capacitor; Characteristics of metal-oxide-semiconductor capacitor, Charge control model
- d. PN Junctions; Energy band diagram, Physics of the Shockley diode equation, Space-charge-layer current, Small-signal characteristics
- e. Characteristics MOS field-effect transistor, Conductivity modulation model, Small-signal equivalent circuit model, Switching memory devices
- f. Characteristics of bipolar junction transistor, Derivation of the Shockley equations, Small-signal characteristics, Switching properties
- g. Characteristics of photonic devices

- 1. Course number and name: EEE 4306C Electronic Circuits II
- **2.** Credits and contact hours: 3 crs; 2 classes of 50 minutes each and 1 laboratory section of 3 hours per week
- 3. Instructor's or course coordinator's name: Dr. William Eisenstadt
- 4. Text book, title, author, and year: A.S. Sedra & K.C. Smith, *Microelectronic Circuits*, latest edition
  - a. other supplemental materials: None

- a. catalog description: Design-oriented continuation of EEE 3308; feedback, op amp circuits and applications, digital electronics. Laboratory
- b. prerequisites: EEL 3111 Circuits I, EEE 3308 Electronic Circuits I
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

## 6. Specific goals for the course

- a. specific outcomes of instruction: The student will know the analysis, design, and testing of analog electronic circuits, their applications of these circuits, and some advanced topics in RF and Communications
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, b, c, i, k

- a. Review of transistors and their DC and small signal models BJT and MOSFET
- b. Review of single transistor amplifiers, CE, CB, CC, CS, CG, CD and multi-stage amplifiers.
- c. Review of differential amplifier
- d. Review of current mirror
- e. Feedback theory
- f. Feedback circuit analysis, Shunt, Series, Open loop gain, Closed loop gain, Node resistances
- g. Feedback circuit Frequency Compensation, and Stability
- h. Operational Amplifier Design CMOS and BJT
- i. Power Amplifier Design
- j. Op-amp application circuits.
- k. Filter Design and Bode Plots
- 1. Passive Element Filters
- m. Active Element Filters with Op-amps
- n. RF components and parasitics, inductors, transformers
- o. Tuned RF circuits and RF Amplifiers
- p. RF Oscillators and Mixers

- 1. Course number and name: EEE 4310C Digital Integrated Circuits
- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. Toshi Nishida
- 4. Text book, title, author, and year: Kang and Leblebici, *CMOS Digital Integrated Circuits, Analysis and Design*, latest edition, McGraw-Hill
  - a. other supplemental materials: None

- a. catalog description: Analysis and design of digital circuits using MOS and bipolar devices
- b. prerequisites: EEE 3308 Electronic Circuits I, EEL 3396 Solid State Devices, EEL 3701 Digital Logic and Computer Systems
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

# 6. Specific goals for the course

- a. specific outcomes of instruction: This course focuses on analysis and design of modern digital circuits. Transistors are introduced and described from a digital point of view, and the performance of various circuits is derived and estimated. CMOS digital circuits will be introduced and analyzed. Students will investigate and design digital circuits using L\_EDIT and SPICE.
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, c, e, i, k

- a. MOS device physics, substrate bias effects, scaling, and SPICE
- b. MOS capacitances
- c. CMOS fabrication, process flow, and design rules
- d. Static CMOS inverter
- e. CMOS inverter dynamic response
- f. Load capacitance estimation
- g. Short channel effects on CMOS inverter
- h. Static CMOS combinational logic
- i. Ratioed logic and pass transistor logic
- j. Dynamic logic, sequential logic, and memory circuits

- 1. Course number and name: EEE 4329 Future of Microelectronics Technology
- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. Scott Thompson
- 4. Text book, title, author, and year: Waser, Rainer (ed), Nanoelectronics and Information Technology: Advanced Electronic Materials and Novel Devices, John Wiley & Sons, 2003 or equivalent
  - a. other supplemental materials: approximately 15 journal papers and handouts

- a. catalog description: Survey of state-of-the-art microelectronics technology and prospects for future technologies. Nanoscale MOSFETs, strained Si, high-k gate dielectrics, carbon nanotubes, molecular electronics, single-electron devices
- b. prerequisites or co-requisites: EEL 3396 Solid State Devices or consent of instructor
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

## 6. Specific goals for the course

- a. specific outcomes of instruction: The student will be able to select the most appropriate architecture for a given design and explain if and how improved semiconductor technologies would improve overall performance in a way that makes a redesign warranted.
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, c, e, i, k

- a. Moore's Law and microelectronic industry trends
- b. Logic device: State of the Art for a Si MOSFET
- c. Requirements for a logic device replacement
- d. CMOS devices limits: quantum-statistical
- e. Post CMOS logic device
- f. Multi-Gate CMOS
- g. Carbon nanotubes
- h. High level overview of Quantum Transport Devices
- i. Single electron devices for Logic applications
- j. Spintronics
- k. Memory devices
- 1. DRAM, ferroelectric, magneto resistive, and phase change RAM

- 1. Course number and name: EEE 4331 Microelectronic Fabrication Technologies
- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. David Arnold
- **4.** Text book, title, author, and year: S. A. Campbell, *Fabrication Engineering at the Micro- and Nanoscale*, Oxford Press, latest edition
  - a. other supplemental materials: None

- a. brief description of the content of the course (catalog description):
- b. prerequisites: EEL 3396 Solid State Electronic Devices
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

#### 6. Specific goals for the course

- a. specific outcomes of instruction: The student will have an understanding of microelectronics fabrication processing technologies which will prepare the student for careers in the semiconductor industry, hands-on research relating to microelectronics processing, follow-on classes in devices and circuits (e.g. solid-state devices, VLSI, MEMS, optoelectronics, nanotechnology, etc.)
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, e, k

- a. Intro to Microelectronic Fabrication
- b. Semiconductor Substrates
- c. Thermal Oxidation
- d. Diffusion
- e. Ion Implantation
- f. Optical Lithography
- g. Photoresists
- h. Vacuum Systems
- i. Etching
- j. Physical Deposition
- k. Chemical Vapor Deposition
- 1. Device Isolation, Contacts, and Metallization
- m. CMOS Technologies
- n. Bipolar Technologies
- o. MEMS

- 1. Course number and name: EEE 4373 Radio Frequency Electronics
- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. Jane Gu
- **4.** Text book, title, author, and year: R. Ludwig and P. Bretchko, *RF Circuit Design, Theory and Applications*, latest edition, Prentice Hall
  - a. other supplemental materials: None

- a. catalog description: This course will cover fundamental RF theory (such as resonant circuits, matching, noise and transmission lines), radio operation, and the design of key RF circuit blocks (such as amplifiers, mixers and oscillators).
- b. prerequisites: EEL 3396 Solid State Electronic Devices
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

## 6. Specific goals for the course

- a. specific outcomes of instruction Students will know the basics of electronic components, circuits, and systems and will be able to design electronic circuits and systems to meet desired needs and specifications. Students will be encouraged to engage in life-long learning of electronics and related technologies.
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, e, k

- a. Introduction and Review
- b. Resonant Circuits, Impedance Matching
- c. Transmission Lines
- d. Smith Charts, Impedance Matching w/ Smith Charts
- e. Network Representations, 2 port, S-parameters
- f. LNA; Output Matching, Input Matching, Power Gain
- g. Noise Factors
- h. Stability, Linearity
- i. RF Systems
- j. Oscillators, VCO, Phase Noise

- 1. Course number and name: EEE 4420 Introductory Quantum Mechanics for Nanodevices
- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. Jing Guo
- 4. Text book, title, author, and year: Jasprit Singh, *Modern Physics for Engineers*, John Wiley and Sons, latest edition
  - a. other supplemental materials: None

- a. catalog description: Physical principles of modern solid-state devices and their applications; quantum mechanics; fundamentals of nanoelectronics
- b. prerequisites: EEE 3396-Solid State Electronic Devices
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

## 6. Specific goals for the course

- a. specific outcomes of instruction: The student will be able to explain the principles underlying the analysis and design of solid-state and nanoscale electronic devices not treated in prerequisite courses and the methods of approximation and physical reasoning basic to that analysis
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: e, i, k

- a. Wave Behavior of Particles
- b. Particles in Periodic Potentials
- c. Particles in Attractive Potentials
- d. Tunneling of Particles
- e. Introduction to Nanoelectronics
- f. Nanoscale silicon transistors
- g. Low-dimensional electronic and photonic devices

# 1. Course number and name: EEL 2000 - Introduction to Electrical and Computer Engineering

2. Credits and contact hours: 2 crs, 2 classes per week of 50 minutes each

# 3. Instructor's or course coordinator's name: Dr. Herman Lam

# 4. Text book, title, author, and year: None

a. other supplemental materials: None

# 5. Specific course information

- a. catalog description: Introduction to Electrical and Computer Engineering tools -hardware and software. Professional ethics, career development. To provide hands-on experience, students assemble and test hardware projects
- b. prerequisites or co-requisites: None
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: not part of the Computer Engineering program (in the EE program only; included here for reference since some Computer Engineering students do take it).

# 6. Specific goals for the course

- a. specific outcomes of instruction: The student will know about the Electrical and Computer Engineering profession, particularly the differences in sub-fields. The student will know about career opportunities and how to prepare for them as well as understanding professional issues such as ethics and continuing education
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: not applicable (not in the program)

- a. Learning the ropes
  - i. Representatives from ECE and College of Engineering Student Services
  - ii. Representative from ECE Technical Support
- b. Overview of ECE curriculum and ECE programs
- c. For ECE area in department (guest speakers)
  - i. Undergraduate curriculum
  - ii. Grad school and research in that area
  - iii. What are the career opportunities?
- d. Students' perspectives
  - i. Panel ECE student leaders, Q&A
- e. Ethical issues for engineers
  - i. Student honor code, case examples
  - ii. IEEE code of ethics, case examples
  - iii. Ethical Issues patents, copyrights
- f. Other ECE topic
  - i. Finding a job, career choices, outsourcing trends, data
- g. Documentation, patents, copyrights

- 1. Course number and name: EEL 3003 Elements of Electrical Engineering
- 2. Credits and contact hours: 3 crs; 3 classes per week of 50-minutes each
- 3. Instructor's or course coordinator's name: Ms. Wenhsing Wu
- **4.** Text book, title, author, and year: Irwin and Nelms, *Basic Engineering Circuit Analysis*, 10<sup>th</sup> edition, John Wiley & Sons
  - a. other supplemental materials: None

- a. catalog description: An introduction to the theory and practice of Electrical Engineering for students no majoring in Electrical Engineering; circuits, machines, electronics and systems
- b. prerequisites: MAC 2313 Analytical Geometry & Calculus 3, PHY 2049 Physics with Calculus 2
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Service course – required by other engineering departments. Not in the Computer Engineering program (included here for reference).

## 6. Specific goals for the course

- a. specific outcomes of instruction: The non-Electrical Engineering student will know the concepts, vocabulary, and problem-solving methods used in the field of Electrical Engineering
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: not applicable (not in the Computer Engineering program)

- a. Circuit Variables
- b. Circuit Elements
- c. Simple Resistive Circuits
- d. Circuit Analysis Techniques
- e. Op Amp circuits
- f. Inductors and Capacitors
- g. First-order Transients
- h. Diodes
- i. AC Circuit Analysis
- j. AC Power

- 1. Course number and name: EEL 3105 Analytical Methods in Electrical Engineering
- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. Pramod Khargonekar
- **4.** Text book, title, author, and year: M. Attenborough, *Mathematics for Electrical Engineering and Computing*, Brooks/Cole, latest edition, ISBN: 0 7596 5855 X
  - a. other supplemental materials: MATLAB

- a. catalog description: Application of calculus to develop the analytical tools used in Electrical Engineering. Real and complex functions; linear spaces, eigenvalue problem; linear differential operators; approximation, curve-fitting, interpolation
- b. prerequisites: MAC 2313 Analytical Geometry & Calculus 3; Programming language
- c. co-requisites: MAP 2302 Differential Equations; EEL 3135 Introduction to Signals & Systems
- d. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Required for CEE students, elective for CEN students

# 6. Specific goals for the course

- a. specific outcomes of instruction: The student will have a basic understanding of the analytical and mathematical fundamentals of the Electrical and Computer Engineering curriculum. The student will be prepared for junior and senior level courses in the areas of control systems, communications, and signal processing
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, e

- a. Vectors
- b. Introduction to MATLAB
- c. Complex numbers
- d. Linear equations
- e. Matrices
- f. Eigenvalues and eigenvectors
- g. Least squares
- h. Approximation, interpolation, curve-fitting
- i. Differential equations
- j. Difference equations
- k. Introduction to Laplace and Fourier transforms

- 1. Course number and name: EEL 3111C Circuits I
- **2.** Credits and contact hours: 4 crs; 3 classes of 50 minutes each and 1 laboratory section of 3 hours per week
- 3. Instructor's or course coordinator's name: Dr. Ramakant Srivastava
- **4.** Text book, title, author, and year: Nilsson and Riedel, *Fundamentals of Electric Circuits*, Prentice Hall, Ninth Edition, 2011; ISBN 0-13-611499-7
  - a. other supplemental materials: None

- a. catalog description: Basic analysis of DC and AC electric circuits. Laboratory
- b. prerequisites: MAC 2313 Analytical Geometry & Calculus 3; PHY 2049 Physics with Calculus 2
- c. co-requisites: MAP 2302 Differential Equations
- d. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Required

#### 6. Specific goals for the course

- a. specific outcomes of instruction: The student will learn how to analyze circuits of arbitrary complexity and be able to specify voltages, currents, and impedance levels at any point(s) in a circuit.
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, b, e, k

- a. Definitions and units of basic electrical quantities
- b. Ohm's law and Kirchhoff's laws and series and parallel dc circuit analysis
- c. Dependent sources, input and output resistances, and operational amplifiers
- d. Mesh, loop and nodal analyses of general dc resistive and op-amp circuits
- e. DC network theorems and bridge circuits
- f. Use of PSpice for dc circuit analysis
- g. Capacitors and inductors
- h. First-order transient analysis of RL and RC circuits
- i. Use of PSpice for transient analysis
- j. Sinusoids, phasors, phasor circuits, impedance and admittance
- k. Nodal, mesh and loop analyses of general ac circuits
- 1. Network theorems applied to ac circuits; PSpice applied to ac circuits
- m. Bode plots and use of PSPICE to obtain frequency-response plots
- n. Average power, rms values, apparent power, and complex power

- 1. Course number and name: EEL 3112 Circuits II
- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. Fred Taylor
- **4.** Text book, title, author, and year: B.P. Lathi, *Signal Processing and Linear Systems*, Oxford University Press, latest edition
  - a. other supplemental materials: None

- a. catalog description: Continuation of EEL 3111 with emphasis on circuit applications of convolution, the Fourier series, and Laplace and Fourier transforms
- b. prerequisites: EEL 3111-Circuits 1, EEL 3135-Introduction to Signals & Systems, EEL 3105-Analytical Methods in Electrical Engineering
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Required for CEE students, elective for CEN students

# 6. Specific goals for the course

- a. specific outcomes of instruction: The student will know the fundamental theory of Electrical Engineering through analysis, design and implementation of skills in those areas of Electrical Engineering needed to solve problems in the domain of Electrical Engineering
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, k

- a. Intro, continuous-time signals and systems
- b. Continuous-time linear systems: zero-state and zero-input responses, impulse response and convolution
- c. Lumped-parameter systems and circuits differential eqs: solution in the time domain, natural modes, impulse response. BIBO stability
- d. Spectra of periodic signals: Fourier series. Response of LTI systems to periodic signals: frequency response
- e. Spectra of a periodic signals: Fourier transform. Frequency response of LTI systems and impulse response
- f. Frequency response of systems and circuits modeled by diff eqs; passive oneports, impedance functions
- g. Laplace transform and its application to circuits and system analysis: system function, poles, zeros, natural modes, stability
- h. More frequency response: Bode plots, analog filter design by pole and zero placement

- 1. Course number and name: EEL 3135 Introduction to Signals and Systems
- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. Jose Principe
- **4.** Text book, title, author, and year: James H. McClellan, Ronald W. Schafer, Mark A. Yoder, *Signal Processing First*, Prentice-Hall, 2003, ISBN 0-13-090999-8
  - a. other supplemental materials: None

- a. catalog description: Continuous-time and discrete-time signal analysis including Fourier series and transforms; sampling; continuous-time and discrete-time linear system analysis with FIR and IIR systems; impulse response, frequency response and system function
- b. prerequisites: CGS 2425 Introduction to CIS; MAC 2313 Analytical Geometry and Calculus 3
- c. co-requisites: MAP 2302 Differential Equations; One of: EEL 3105 Analytical Methods in Electrical Engineering, MAS 3114 – Computational Linear Algebra or MAS 4105 - Linear Algebra 1
- d. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Required for CEE students. CEN students may take this or EEL 3308C.

# 6. Specific goals for the course

- a. specific outcomes of instruction: The student will know the analytical skills necessary for further study in communications, control, and signal processing
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, e, k

- a. Intro, sinusoids, intro to computer
- b. Spectra of periodic signals: Fourier series
- c. Sampling theory and finite impulse response filters; linear time invariant systems and impulse response
- d. Sinusoidal response of LTI systems; frequency response of FIR filters
- e. The z-transform; application to filters
- f. Infinite impulse response filters
- g. Basics of continuous-time signals and systems
- h. Frequency response of continuous-time systems

- 1. Course number and name: EEL 3211 Basic Electrical Energy Engineering
- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. Henry Zmuda
- **4.** Text book, title, author, and year: A. E. Fitzgerald, Charles Kingsley, Jr., and Stephen D. Umans, *Electric Machinery*, latest edition, McGraw-Hill
  - a. other supplemental materials: None

- a. catalog description: Analysis and modeling of power system components. Magnetic circuits, energy conservation, transformers, AC and DC rotating machines
- b. prerequisites: EEL 3111 Circuits I
- c. co-requisites: EEL 3112 Circuits II
- d. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

## 6. Specific goals for the course

- a. specific outcomes of instruction: The student will know the basics magnetic circuits, transformers, motors, and generators and how to design circuits and systems to meet desired needs.
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course: a, k

- e. Preliminary Material/Review
- f. Mechanical and Electromagnetic Fundamentals
- g. Three-Phase Circuits
- h. Transformers
- i. Fundamentals of Electro-Mechanical Energy Conversion
- j. AC Machinery Fundamentals
- k. Synchronous Machines
- 1. Induction Motors
- m. DC Motors
- n. Stepper Motors
- o. Single Phase Motors (as time permits)

# 1. Course number and name: EEL 3402 - Remote Sensing in Engineering: Science, Sensors and Applications

- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. Jasmeet Judge

## 4. Text book, title, author, and year: None

a. other supplemental materials: Handouts from: Elachi, C., *Introduction to the Physics and Techniques of Remote Sensing*, John Wiley & Sons, 1987; Lilesand and Keifer, *Remote Sensing and Image Interpretation*, John Wiley & Sons, 2003; Schultz and Engman, *Remote Sensing in Hydrology and Water Management*, Springer, 2000; Schott, J., *Remote Sensing: The image change approach*, Oxford University Press, 1997; Ulaby, F., *Fundamentals of Applied Electromagnetics*, Prentice Hall, 2006; Ulaby, Moore, and Fung, *Microwave Remote Sensing: Volume I, Fundamentals and Radiometry*, Addison-Wesley, 1981; Ulaby, Moore, and Fung, *Microwave Remote Sensing: Volume II, Active*, Addison-Wesley, 1981

## 5. Specific course information

- a. catalog description: The student will have developed an understanding of remote sensing theory, systems and applications using information obtained from the visible/near infrared, thermal infrared and microwave regions of the EM spectrum
- b. prerequisites: MAP 2302 Differential Equations or equivalent
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

#### 6. Specific goals for the course

- a. specific outcomes of instruction: To develop an understanding of remote sensing theory and systems in visible; infrared; and microwave regions of the EM spectrum
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, c, e, g, i, k

- a. Science and Theory of Remote Sensing
  - i. Introduction: Electromagnetic spectrum and applications of remote sensing
  - ii. Radiative transfer theory in VI, IR, and Microwave
- b. Sensors in Remote Sensing
  - i. Passive sensors used in the Visible, IR, and Microwave regions
  - ii. Active Sensors in Visible/NIR and Microwave regions
- c. Remote Sensing Applications to Engineering
  - i. Student presentations (Examples include applications for environment, agriculture, hydrology, wireless communications, defense, archaeology, etc)

- 1. Course number and name: EEL 3472 Electromagnetic Fields and Applications I
- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. Vladimir Rakov
- **4.** Text book, title, author, and year: F.T. Ulaby, *Fundamentals of Applied Electromagnetics*, Prentice Hall, latest edition
  - a. other supplemental materials: None

- a. catalog description: Transmission line equations, electrostatics, magnetostatics, time-varying fields, plane waves, introduction to antennas and waveguides
- b. prerequisites: EEL 3111 Circuits I
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Elective

## 6. Specific goals for the course

- a. specific outcomes of instruction: The student will know the basics of electromagnetic fields and how to apply concepts to practical problems
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, k

- a. Transmission Lines
- b. Review of Vector Analysis
- c. Electrostatics
- d. Magnetostatics
- e. Time-Varying Fields
- f. Electromagnetic Waves

# 1. Course number and name: EEL 3473 - Electromagnetic Fields and Applications II

- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. Robert Moore
- **4.** Text book, title, author, and year: F.T. Ulaby, *Fundamentals of Applied Electromagnetics*, Prentice Hall; latest edition
  - a. other supplemental materials: None

## 5. Specific course information

- a. catalog description: Maxwell's equations, electromagnetic wave propagation in different media, antennas, waveguides, numerical methods, electromagnetic coupling
- b. prerequisites or co-requisites: EEL 3472 Electromagnetics and Field Applications I
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

# 6. Specific goals for the course

- a. specific outcomes of instruction: The student will know Maxwell's equations and their applications to modern design
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, e, k

- a. Maxwell's equations for time-varying fields
- b. Plane-wave propagation
- c. Wave reflection and transmission
- d. Radiation and Antennas
- e. Waveguides

- 1. Course number and name: EEL 3701C Digital Logic and Computer Systems
- **2.** Credits and contact hours: 4 crs; 3 classes per week of 50 minutes each, one 3-hour laboratory section per week
- 3. Instructor's or course coordinator's name: Dr. Eric Schwartz
- **4.** Text book, title, author, and year: Charles H. Roth, Jr., *Fundamentals of Logic Design*, latest edition
  - a. other supplemental materials: None
  - b. Required Hardware for Laboratory: UF-designed PCB (with Altera 7064 CPLD) included with lab fee; USB Byte Blaster for programming CPLD

- a. catalog description: An overview of logic design, algorithms, computer organization and assembly language programming and Computer Engineering technology. Laboratory.
- b. prerequisites: Programming
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Required

## 6. Specific goals for the course

- a. specific outcomes of instruction: The student will be able to perform elementary manipulations of Boolean algebraic equations; simplify logic expressions; design combinational and sequential circuits; use a digital design and simulation package, use a hardware description language (HDL), analyze binary storage device behavior and applications, and to study the fundamentals of microprocessor architecture, including assembly language programming and the design of basic components of a microprocessor
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: b, c, e, k

- a. Digital Design; Basic Logic; Mixed Logic; ICs
- b. Introduction to Altera's Quartus for Schematic Entry
- c. Number Systems and Arithmetic; Boolean Algebra, K-Maps
- d. MSI Components: MUX, Demux, Decoder, Encoder, Adder; Tristate Buffer, etc.
- e. Arithmetic Logic Unit (ALU)
- f. Introduction to Sequential Circuits; Flip-Flops; Excitation Tables; Next State Tables
- g. Design with FFs; Counter Design; Debouncing
- h. Intro to VHDL (using Altera's Quartus)
- i. SRAM and DRAM, ROM; Programmable Logic: PLD, CPLD, Altera MAX7000 CPLD
- j. State Machines: Mealy, Moore; ASM Design and Implementation; ROM-based State Machine Design

- k. Intro to Computer Architecture; Addressing Modes; Data Transfer Instructions
- 1. Instruction Set; Assembly Language Programming; Creating new (Macro) Instructions
- m. Computer Operation Cycles and Timing; Memory Maps; G-CPU Processor Architecture
- n. Modifying Processor Architecture to Add New Instructions

- 1. Course number and name: EEL 3834 C++ Programming for Electrical Engineers
- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name:
- 4. Text book, title, author, and year: None
  - a. other supplemental materials: None

- a. catalog description: Develop computer skills and art of writing good computer programs using C and C++ languages. Examples and exercises relevant to Electrical Engineering are used
- b. prerequisites or co-requisites: None
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

## 6. Specific goals for the course

- a. specific outcomes of instruction: The student will have a more detailed understanding of data handling, graphics programming, and computer communications in an engineering environment
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, d, e, k

- a. Introduction to the Visual Studio programming environment
- b. Engineering data types / Programming with the console
- c. Saving and storing data to files in text and binary formats
- d. IEEE Floating Point interpretation/ Microcontroller math
- e. Document/View Architecture and the Foundation Classes
- f. Introduction to graphical programming in Windows
- g. Plotting data
- h. Interactive drawing techniques.
- i. Using serialization and advanced object techniques
- j. Serial Communications (RS-232) ActiveX controls
- k. Packet protocols and error checking
- 1. TCP/IP WinSockets programming
- m. Internet programming techniques

- 1. Course number and name: EEL 3923C Electrical and Computer Engineering Design 1
- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. Gijs Bosman
- 4. Text book, title, author, and year: None
  - a. other supplemental materials: None

- a. catalog description: Student teams design, produce and report on a hard-ware prototype, meeting defined specifications and using a structured design methodology. Project management, hardware prototyping, project reporting
- b. prerequisites: EEL 3111 Circuits I; EEL 3701C Digital Logic and Computer Systems
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Required for CEE students. CEN students take CIS 4912 instead.

## 6. Specific goals for the course

- a. specific outcomes of instruction: The student will have the ability to design a hard-ware prototype, meeting defined specifications, using a structured design methodology
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: c, e, g

- a. Project Management and Reporting
  - i. Gantt chart
  - ii. Concept generation matrix
  - iii. Concept selection (house of quality) matrix
  - iv. Business case, ethics and patent law
  - v. Project proposal, system level design, final report
- b. Lab skills
  - i. Soldering/desoldering of small components
  - ii. Use of logic state analyzer/oscilloscope for trouble shooting
  - iii. Protel software for designing PC boards
  - iv. Embedded controller (PIC, Atmel, TI, or other) programming
- c. Production of prototype
  - i. Product specifications
  - ii. Analog and logic circuit design and simulation
  - iii. Parts selection and procurement
  - iv. PC board design and manufacturing PC board population
  - v. Testing, trouble shooting, validation, verification

- 1. Course number and name: EEL 4201L Electrical Energy Conversion Lab
- 2. Credits and contact hours: 1 cr; 1 laboratory section of 3 hours per week
- 3. Instructor's or course coordinator's name: Dr. Henry Zmuda
- **4.** Text book, title, author, and year: Alexander Domijan, Jr., *Electric Energy Conversion Lab Manual* 
  - a. other supplemental materials: None

- a. catalog description: Electric energy conversion, devices and systems
- b. prerequisites: EEL 3211 Basic Electric Energy Systems
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

#### 6. Specific goals for the course

a. specific outcomes of instruction: The student will assemble and measure three phase power generation. Using an existing lab station, a student will measure performance under loaded conditions of synchronous generators as well as synchronous, induction, and dc-motors. The student will be measure and explain motor torque-load characteristics under various operating conditions explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: b, e, k

- a. Laboratory 1: Three-Phase Power Measurements
- b. Laboratory 2: Single-Phase Transformers
- c. Laboratory 3: Three-Phase Transformers
- d. Laboratory 4: DC Motors
- e. Laboratory 5: DC Generators, Part A: Machine Constant, DC Generator Output Characteristics
- f. Laboratory 6: DC Generators, Part B: Generator Torque Calculations
- g. Laboratory 7: AC Synchronous Generators: {V, I, P}-Relations, Synchronous Impedance Calculations
- h. Laboratory 8: Induction Motors, Part A: Torque-Speed Characteristics
- i. Laboratory 9: Induction Motors, Part B: Equivalent Circuit Parameters

- 1. Course number and name: EEL 4242C Power Electronics
- **2.** Credits and contact hours: 3crs; 2 classes per week of 50 minutes each, 1 3-hour laboratory section
- 3. Instructor's or course coordinator's name:
- **4. Text book, title, author, and year:** Robert W. Erickson & Dragan Maksimovic, *Fundamentals of Power Electronics*, latest edition
  - a. other supplemental materials: None

- a. catalog description: Circuit topologies, analysis, design and simulation of electronic circuits such as power supplies and motor drives. Laboratory
- b. prerequisites: EEE 3308 Electronic Circuits I
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

## 6. Specific goals for the course

- a. specific outcomes of instruction: The student will know the basics of power electronic components, circuits, and systems and will be able to design power electronic circuits and systems to meet desired needs. Engage in life-long learning.
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, b, c, e, i, k

- a. DC-DC Conversion: PWM Topologies & DC Analysis
- b. Magnetics: Materials, Transformers, & Inductors
- c. Capacitors
- d. Power Semiconductors: Models, Drives, & Protection
- e. Thermal Management
- f. Dynamics of PWM DC-DC Converters
- g. Closed-Loop Control of PWM DC-DC Converters
- h. Integrated Circuits for Power Electronic
- i. Simulation of Power Electronic Circuits
- j. Design Project
- 1. Course number and name: EEL 4351 Electronic Device Fundamentals
- 2. Credits and contact hours: 3crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. Jing Guo
- 4. Text book, title, author, and year: Jasprit Singh, *Modern Physics for Engineers*, John Wiley and Sons, latest edition
  - a. other supplemental materials: None

- a. catalog description: Physical principles of modern solid-state devices and their practical applications
- b. prerequisites: EEL 3396 Solid State Devices
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

### 6. Specific goals for the course

- a. specific outcomes of instruction: The student will be able to explain the principles underlying the analysis and design of solid-state devices not treated in prerequisite courses and the methods of approximation and physical reasoning basic to that analysis
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: e, i, k

- a. Wave Behavior of Particles
- b. Particles in Periodic Potentials
- c. Particles in Attractive Potentials
- d. Tunneling of Particles
- e. Introduction to Nanoelectronics
- f. Nanoscale silicon transistors
- g. Low-dimensional electronic and photonic device

- 1. Course number and name: EEL 4440 Optical Communication Systems
- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. Huikai Xie
- **4.** Text book, title, author, and year: J.C. Palais, *Fiber Optic Communications*, latest edition, Pearson Prentice Hall
  - a. other supplemental materials: Optical Fiber Communications, Gerd Keiser, latest edition, McGraw-Hill; Fiber-Optic Communication Systems, 3rd Ed., G. P. Agrawal, John Wiley & Sons, latest edition; Optical Sources, Detectors, and Systems, Robert H. Kingston, Academic Press, latest edition

- a. catalog description: Introduction to electromagnetic waves, dielectric waveguides and fibers, propagation characteristics of fibers, characterization methods, LEDs and laser diodes, photodetector optical receivers and communication systems
- b. prerequisites: EEL 3472 Electromagnetic Fields and Applications I
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

### 6. Specific goals for the course

- a. specific outcomes of instruction: The student will understand the fundamentals of the operation and design of fiber optic systems and components employed in such communication systems
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, e, k

- a. Overview of fiberoptic communication systems: evolution, nature of light, advantages and applications
- b. Optics Review: Ray theory, lenses, imaging, numerical aperture, diffraction
- c. Lightwave fundamentals: introduction to electromagnetic waves, wave equations, group velocity, dispersion, polarization, resonant cavities, total internal reflection
- d. Integrated optic waveguides: dielectric-slab waveguide, modes, coupling, dispersion, integration
- e. Optic fibers: step-index fibers, graded-index fibers, modes and fields in fibers, pulse broadening and information rate, fiber fabrication and characterization
- f. Optical sources and amplifiers: PN junction, LEDs, laser principles, laser diodes, tunable laser diodes, VCSELs, modulation, optical amplifiers
- g. Optical receivers: photomultipliers, photodiodes, APDs, responsivity, quantum efficiency, noise, heterodyne detection, preamplifiers
- h. WDM concepts and components: WDM principles, N'N couplers, star couplers, add/drop multiplexers, fiber grating filters, tunable sources, and tunable filters
- **i.** All optical-switching: advantages, MEMS introduction, optical MEMS devices for optical switching

# 1. Course number and name: EEL 4445 - Optics for Engineers

2. Credits and contact hours: 4 crs;

# 3. Instructor's or course coordinator's name: Dr. Ramakant Srivastava

## 4. Text book, title, author, and year: None

a. other supplemental materials: None

## 5. Specific course information

- a. catalog description: Nature of light, radiometry, laser basics, interferometry, holography, coherence, polarization, diffraction, fiber optics, Fourier optics
- b. prerequisites: EEL 3472 Electromagnetics and Field Applications I
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

## 6. Specific goals for the course

- a. specific outcomes of instruction: The student will have a basic knowledge of optics and related applications
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, e, k

- a. Electromagnetic spectrum, radiometry, photometry, blackbody radiation
- b. Reflection in plane mirrors, refraction through plane surfaces; imaging by anoptical systemReflection in plane mirrors, refraction through plane surfaces; imaging by anoptical system at a sperical surface, refraction at a spherical surface, thin lenses, vergence and refractive power, Newtonian equation for the thin lens
- c. Einstein's quantum theory of radiation, essential elements of a laser, simplified description of laser operation, characteristics of laser light, laser types and parameters
- d. One-dimensional wave equation, plane waves, spherical waves, complex refractive index, electromagnetic waves, superposition principle, superposition of waves of the same frequency, random and coherent sources, stranding waves, phase and group velocities
- e. Two beam interference in dielectric films, the Michelson interferometer, Stokes' relations, multiple-beam interference in a parallel plate, Fabry-Perot interferometer, fringe profiles, the Airy function, resolving power, free spectral range
- f. Mathematical representation of polarized light-Jones vectors, mathematical representation of polarizers-Jones matrices, birefringence-polarization with two refractive indices, double refraction
- g. Diffraction from a single slit, beam spreading, rectangular and circular apertures, resolution, double-slit diffraction, diffraction from many slits, the grating equation, free spectral range of a grating, dispersion of a grating, resolution of a grating

- h. Transfer matrix, reflectance at normal incidence, two-layer anti-reflecting films, three-layer anti-reflecting films
- i. Optics of propagation in fibers, attenuation, distortion of pulses and dispersion
- j. Fourier analysis of finite harmonic wave train, temporal coherence, natural line width, optical data processing, Fourier transform spectroscopy

- 1. Course number and name: EEL 4458 Fundamentals of Photonics
- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. Huikai Xie
- **4.** Text book, title, author, and year: Clifford Pollock and Michael Lipson, *Integrated Photonics*, Kluwer Academic, 2003
  - a. other supplemental materials: Extensive course notes and journal papers are distributed

- a. catalog description: Review of electromagnetic fields and waves, energy bands in semiconductors, p-n junctions and optical properties of semiconductors. Fundamentals of optical modulators and waveguides, and photonic applications:
- b. prerequisites: EEL 3396 Solid State Devices, EEL 3472 Electromagnetic Fields and Applications I
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

### 6. Specific goals for the course

- a. specific outcomes of instruction: The student will learn the unique aspects of the propagation of light in physical media, learn to quantify and exploit where possible the effects of dispersion and nonlinearities, particularly optical amplification, and learn how to design an electrically modulated photonic system to meet specific performance requirements with regard to signal-to-noise ratio, dynamic range, and bandwidth
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: EE2, EE3, a, c, e, i

- a. Review of Electromagnetic Field Theory
- b. Planar Waveguides
- c. Dispersion
- d. Graded Index Waveguide
- e. Optical Fiber
- f. Loss and Nonlinear Phenomenon
- g. Detection and Noise
- h. Semiconductor Photodectors
- i. Electrical Modulation of Light
- j. Rectangular Waveguide
- k. Optical Couplers

- 1. Course number and name: EEL 4461 Antenna Systems
- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. Jenshan Lin
- **4.** Text book, title, author, and year: C.A. Balanis, *Antenna Theory–Analysis and Design*, latest edition
  - a. other supplemental materials: None

- a. catalog description: Electromagnetic field theory and its application to antenna design
- b. prerequisites: EEL 3472 Electromagnetic Fields and Applications I
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

### 6. Specific goals for the course

- a. specific outcomes of instruction: The student will understand the fundamental principles of antenna theory and will know how to apply them to the design and analysis of antenna systems.
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, e, k

- a. Introduction; Review of electromagnetic field theory
- b. Introduction of different types of antennas and their applications
- c. Antenna radiation pattern, power density, and intensity
- d. Antenna beamwidth, directivity, efficiency, gain
- e. Antenna polarization, input impedance, effective aperture
- f. Friis transmission equation and radar range equation
- g. Far-field radiation and vector potential
- h. RF propagation, weather effect, RF safety
- i. Dipole antennas
- j. Ground reflection effect of vertical and horizontal dipoles
- k. Antenna design using CAD
- 1. Microstrip patch antennas
- m. Loop antennas
- n. Antennas and wireless system

- 1. Course number and name: EEL 4514 Communication Systems and Components
- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. Tan Wong
- **4.** Text book, title, author, and year: B. P. Lathi and Z. Ding, *Modern Digital and Analog Communication Systems*, Oxford University Press, latest edition
  - a. other supplemental materials: MATLAB Student Version, MathWorks, Inc

- a. catalog description: Theory of communication, and applications to radio, television, telephone, satellite, cellular telephone, spread spectrum and computer communication systems
- b. prerequisites: EEL 3111-Circuits II; EEL 3135-Introduction to Signals & Systems
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

### 6. Specific goals for the course

- a. specific outcomes of instruction: The student will learn to: Work with equations for propagation; Translate between signals and their Fourier transforms; Represent analog signals by digital signals; Determine bandwidth; Translate between bandpass and complex baseband representations; Perform filtering in the time and frequency domains; Identify pros and cons of common analog and digital communications; Perform system-level design of receivers for common modulations; Simulate communication systems
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, b, c, e, h, i, k

- a. Introduction and history
- b. Channels and propagation
- c. Signals and spectra
- d. Baseband analog communications
- e. Bandpass analog communications
- f. Baseband digital communications
- g. Bandpass digital communications
- h. Applications

## 1. Course number and name: EEL 4514L - Communications Laboratory

- 2. Credits and contact hours: 1 cr; 1 laboratory section of 3 hours per week
- 3. Instructor's or course coordinator's name: Dr. Tan Wong
- 4. Text book, title, author, and year: In-house Lab manual provided by instructora. other supplemental materials: None

### 5. Specific course information

- a. catalog description: Communication circuits and radio frequency instruments, devices and measurements
- b. prerequisites: EEE 3308 Electronic Circuits I
- c. co-requisites: EEL 4514 Communication Systems and Components
- d. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

### 6. Specific goals for the course

- a. specific outcomes of instruction: The student will be familiar with RF test equipment; to give student ability to design and verify the performance of communication circuits
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, b, c, e, g, h, i, k

- a. RF measuring equipment such as digital storage oscilloscope, function generator, and spectrum analyzer
- b. Frequency response of systems and distortion
- c. Sinusoidal oscillators
- d. Amplitude modulation and envelope detection
- e. Phase-Locked Loop and Frequency Modulation
- f. Phase-Locked Loop as FM and FSK demodulator
- g. Sampling and pulse amplitude modulation
- h. Inter-symbol interference and eye patterns
- i. Mini-project: a Morse code transceiver based on On-Off Keying

- 1. Course number and name: EEL 4516 Noise in Devices and Communication Systems
- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. John Shea
- 4. Text book, title, author, and year: Sheldon Ross, A First Course in Probability, Prentice Hall, latest edition; B. P. Lathi and Z. Ding, Modern Digital and Analog Communications Systems, Oxford University Press, latest edition
  - a. other supplemental materials: None

- a. catalog description: Origin, characterization and measurement of random noise. Calculation of signal-to-noise ratios and probability of errors in communication systems.
- b. prerequisites: EEL 4514 Communication Systems and Components
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

### 6. Specific goals for the course

- a. specific outcomes of instruction: The student will be able to use probability to model and analyze communications; choose appropriate modulations based on system constraints; design optimal demodulators (in terms of minimizing probability of error) for common signaling formats; evaluate the error probability for common modulations; and evaluate the use of error-control coding with digital modulation
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, b, c, e, i, j, k

- a. Introduction of Probability in Communications
- b. Random Signals: Probability; Random Variables; Statistical Decision Theory; Random Processes and Filtering of Random Processes
- c. Digital Communications
  - i. formatting and baseband modulation; Baseband demodulation and detection;
  - ii. Bandpass modulation and demodulation;
  - iii. Basics of error control coding;
  - iv. Multiplexing and multiple access;
  - v. Cellular communications; Spread-spectrum techniques

# 1. Course number and name: EEL 4523 - Audio Engineering

2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each

### 3. Instructor's or course coordinator's name: Dr. John Shea

- 4. Text book, title, author, and year: Sheldon Ross, A First Course in Probability, Prentice Hall, latest edition; B. P. Lathi and Z. Ding, *Modern Digital and Analog Communications Systems*, Oxford University Press, latest edition
  - a. other supplemental materials: None

### 5. Specific course information

- a. catalog description: The student will know the underlying theory of acoustics, electronics, and signal processing, and will be able to demonstrate modern audio engineering practice as applied to music, home audio, recording and sound reinforcement.
- b. Prerequisites: EEL 3111C Circuits 1 or EEL 3003 Elements of Electrical Engineering or consent of instructor
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

### 6. Specific goals for the course

- a. specific outcomes of instruction: The student will understand the underlying theory of acoustics, electronics and signal processing and will be able to demonstrate modern engineering practice as applied to music, home audio, recording and sound reinforcement.
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: EE1, a, k

- Signals
- Second-order systems and resonance
- Acoustics of sound generation, musical instruments
- Microphones
- Signal chains
- Signal interfacing
- Operational amplifiers and their application in audio signal processing
- Signal processing blocks (mixer, compressor, phaser, equalizer, etc.)
- Loudspeakers
- Room acoustics
- Psychoacoustics

- 1. Course number and name: EEL 4598 Data and Computer Communications
- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. Janise McNair
- **4.** Text book, title, author, and year: W. Stallings, *Data and Computer Communications*, latest edition, Prentice Hall
  - a. other supplemental materials: None

- a. catalog description: Intro to the principles and practice of computer networking, emphasizing data communication and the lower layers of the OSI and TCP/IP protocol architectures
- b. prerequisites: EEL 3701 Digital Logic and Computer Systems; EEL 4514 Communications Systems and Components Programming
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

## 6. Specific goals for the course

- a. specific outcomes of instruction: The student will understand the principles and practice of data and computer communications
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, e, k

- a. OSI and TCP/IP protocol architectures
- b. Physical layer: Data transmission (signals, noise, Fourier representation); Physical media (copper wire, fiber, wireless); Analog and digital transmission (encoding, modulation, SNR); Multiplexing and switching (crossbar, TDM, STM, ATM)
- c. Data link layer: Framing and Synchronization (bit, character stuffing); Error detection and correction (bit errors, parity checks); Coding (cyclic redundancy check, shift registers); Error control techniques (ATM, HDLC); Flow control protocols (Stop & Wait, Sliding Window); Automatic Repeat reQuest (ARQ) protocols
- d. Medium access control layer: Local area network topologies; Medium access protocols; Local area networks (Ethernet, IEEE 802.x standards)
- e. Network layer: Network layer switching (packet, circuit, virtual circuit); Internetworking (Internet Protocol, fragmentation, subnets)

- 1. Course number and name: EEL 4610 State Variables and Control
- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. Haniph Latchman
- 4. Text book, title, author, and year: C-T. Chen, *Linear System Theory and Design*, latest edition
  - a. other supplemental materials: None

- a. catalog description: Development of state-variable approach to linear continuoustime and discrete-time systems with emphasis on the design of feedback control systems
- b. prerequisites: EEL 3135 Signals and Systems; EEL 3112 Circuits II
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

### 6. Specific goals for the course

- a. specific outcomes of instruction: The topics in this course are part of the fundamental theory of Electrical Engineering and provides depth in the analysis, design, and implementation skills in those areas of Electrical Engineering needed to solve problems in the domain of Electrical Engineering.
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, c, e, k

- a. Introduction; historical perspective; control problem
- b. Review of input-output linear systems; the concept of state
- c. Linear algebra
- d. Solution of state equations
- e. Stability: zero-state stability, zero-input stability, asymptotic stability
- f. Controllability and observability; canonical decompositions
- g. State feedback: regulation, tracking, disturbance rejection, stabilization
- h. State estimation and feedback
- i. Minimal realizations
- j. Pole placement
- k. Model matching

- 1. Course number and name: EEL 4657 Linear Control Systems
- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. Jacob Hammer
- **4.** Text book, title, author, and year: Dorf and Bishop, *Modern Control Systems*, Prentice Hall, latest edition
  - a. other supplemental materials: None

- a. catalog description: Theory and design of linear control systems
- b. prerequisites: EEL 3111 Circuits II; EEL 3135 Signals and Systems
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

### 6. Specific goals for the course

- a. specific outcomes of instruction: The student will understand the essentials of mathematical system modeling, be able to assess stability and performance properties of linear systems, and design lead and lag controllers for linear systems using s-domain and frequency domain techniques.
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, c, e, k

- a. System Models Differential Equations, State Space, Transfer Functions, Discrete-Time
- b. Block Diagrams and Masons Formula
- c. Stability Analysis BIBO and Asymptotic Stability, Stability Margins, Routh Hurwitz
- d. Performance Criteria: Steady State Error and Transient Behavior, Percentage Overshoot, Settling Time, Rise Time
- e. Root Locus & Simple Proportional Gain Controller Design
- f. Lead and Lag Design in the s-domain
- g. Nyquist Stability Criterion and Bode Plots
- h. Controller Design in the Frequency Domain
- i. Advanced Topics

- 1. Course number and name: EEL 4657L Linear Control Systems Laboratory
- 2. Credits and contact hours: 1 cr; 1 3-hour laboratory section
- 3. Instructor's or course coordinator's name: Dr. Jacob Hammer
- 4. Text book, title, author, and year: None
  - a. other supplemental materials: None

- a. catalog description: Practical applications of linear control theory
- b. prerequisites: EEL 4657 Linear Control Systems
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

### 6. Specific goals for the course

- a. specific outcomes of instruction: The student will know how to investigate some of the practical aspects in applying classical analog and digital control theory to simple dynamic systems; to introduce computer software to help design and analyze the compensators
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, b, c, e, k

- a. Measuring the characteristics of a DC motor using frequency domain technique
- b. Model verification using DSP board and MATLAB
- c. Introduction to CC
- d. Lag compensation
- e. Introduction to digital control
- f. High level language implementation of a digital controller
- g. Control of an unstable system Part I
- h. Control of an unstable system Part II
- i. Digital Control of an unstable system

## 1. Course number and name: EEL 4665 - Intelligent Machine Design Lab

**2.** Credits and contact hours: 4 crs; 2 classes of 50 minutes each and 2 laboratory sections of 3 hours each per week

## 3. Instructor's or course coordinator's name: Dr. Antonio Arroyo

## 4. Text book, title, author, and year: None

- a. other supplemental materials: None
- b. required hardware for laboratory: Students purchase microprocessor board from industry and build a mobile robotic platform using balsa wood

# 5. Specific course information

- a. required hardware for laboratory: Students purchase microprocessor board from industry and build a mobile robotic platform using balsa wood
- b. Senior standing and EEL 4744-Microprocessor Applications or consent of instructor
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

# 6. Specific goals for the course

- a. specific outcomes of instruction: The student will be able to design a robotic mobile platform from scratch and have it perform elementary behaviors in one semester
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, b, c, e, f, g, k

- a. Sensors; IC Implementation of Sensors
- b. Introduction to Altium Designer for Schematic Entry
- c. Introduction to Solidworks & Inventor for CAD Design
- d. Introduction to IDE Usage (using Atmel's AVRStudio)
- e. Assembly Language & C Behavior Programming
- f. Usage of randomness in robotics
- g. Robot Control, Fuzzy Logic, Behavior Programming
- h. Navigation, Obstacle Avoidance, Behavior Fusion

- 1. Course number and name: EEL 4712C Digital Design
- 2. Credits and contact hours: 4 crs; 3 classes of 50 minutes each and 1 laboratory section of 3 hours per week
- 3. Instructor's or course coordinator's name: Dr. Herman Lam
- **4.** Text book, title, author, and year: S.D. Brown and Z.G. Vranesic, *Fundamentals of Digital Logic with VHDL Design*, latest edition
  - a. other supplemental materials: None

- a. catalog description: Advanced modular logic design, design languages, "finite" state machines and binary logic. Laboratory
- b. prerequisites: EEL 3701 Digital Logic and Computer Systems
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Required

### 6. Specific goals for the course

- a. specific outcomes of instruction: The student will know the fundamentals, methodologies, and techniques for the structured design of digital systems, using the state of the art technologies and design environments and tools
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, c, e, k

- a. Digital design technologies
  - 1. Review, of digital components (MUX, decoders, flip-flops, counters, VHDL,etc.); VHDL Implementation
  - 2. Carry-look-ahead adders, ALUs.
  - 3. Programmable logic devices: PAL's, PLA's, PROM's, CPLD's, and FPGA's
  - 4. Memories RAM, DRAM, and ROM
- b. Digital design methodology and techniques for finite state machines (FSM)
  - 1. Top-down, modular design
  - 2. Controller/controlled-component architecture
  - 3. ASM fundamentals and design methods
  - 4. Design methods traditional, MUX, ROM, "one-hot", CPLDs, FPGA's
  - 5. Testing and design for testing, Digital design examples (labs)
- c. Design environments and tools (lab-intensive)
  - 1. Design life cycle using model digital development environment
  - 2. Design specification: graphical, VHDL
  - 3. Logic synthesis
  - 4. Simulation: functional and timing
  - 5. Timing analysis, Device program, Testing

- 1. Course number and name: EEL 4713C Digital Computer Architecture
- 2. Credits and contact hours: 4 crs; 3 classes of 50 minutes each and 1 laboratory section of 3 hours
- 3. Instructor's or course coordinator's name: Dr. Renato Figueiredo
- **4.** Text book, title, author, and year: Patterson and Hennessey, *Computer Organization & Design*, latest edition
  - a. other supplemental materials: None

- a. catalog description: The use of electronic digital modules to design computers. Organization and operation of computers. Hardware/software tradeoffs. Design of computer interfacing. Laboratory
- b. prerequisites: EEL 3701 Digital Logic and Computer Systems
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

# 6. Specific goals for the course

- a. specific outcomes of instruction: The student will be able to solve complex scientific and engineering problems using digital electronic computational machines; will be able to show the elements of a development system for solutions to problems in this field; have an introductory knowledge of VHSIC Hardware Description Language (VHDL) as a tool for design and synthesis of complex digital systems; will be able to apply it to the implementation of microprocessors using micro-programmed state machines; will be able to show the interplay between algorithms and the architectures on which they run
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, c, e, k

- a. AIntroduction. Components of a computer system. Evolution of technology.
- b. Instruction set architecture design and hardware/software interface.
- c. Organization of single- and multi-cycle RISC microprocessors.
- d. Introduction to the design of key datapath components (ALU, registers, shifters, sign-extenders) using VHDL behavioral and structural descriptions. Introduction to micro-programming.
- e. Performance: measurement, metrics, summarization and interpretation.
- f. Number systems: representation and operations; fixed and floating-point implementations.
- g. Pipelining. Data hazards and forwarding. Superscalar design.
- h. Memory hierarchies, caches: organization, implementation and performance.
- i. Virtual memory: address translation, placement, look-aside buffers.
- j. Input/output. Disk technologies, busses and protocols. I/O system design. Redundant arrays of inexpensive disks (RAID)

# 1. Course number and name: EEL 4720 – Reconfigurable Computing

- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. Gregory Stitt

# 4. Text book, title, author, and year

b. other supplemental materials

# 5. Specific course information

- d. catalog description: Fundamental concepts at advanced undergraduate level in reconfigurable computing based upon advanced technologies in field-programmable logic devices. Topics include general concepts, device architectures, design tools, metrics and kernels, system architectures, and application case studies.
- e. Prerequisites: EEL4712C or EEL5764 or consent of instructor
- f. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

# 6. Specific goals for the course

- c. specific outcomes of instruction: The student will have a fundamental knowledge and understanding of principles and practice in reconfigurable architecture and computing
- d. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course: a, c, e, k

- General overview (< 1 week)
  - Goals and motivations
  - History, state of the art, future trends
  - Basic concepts and related fields of study
  - Performance, power, and other metrics
  - Algorithm analysis and speedup projections
  - VHDL tutorial
  - RC Architectures (~1 week)
    - Device characteristics
    - Fine-grained architectures
    - Coarse-grained architectures
- FPGA Physical Design Tools (~1 week)
  - Technology mapping
  - Placement & routing
- Register Transfer (RT)/Logic Synthesis (1-2 weeks)
  - Controller/Datapath synthesis
  - Logic minimization
- RC Application Design (1-2 weeks)

- Parallelism
- Systolic arrays
- Pipelining
- Optimizations
- Bottlenecks
- High-level Design (~3 weeks)
  - High-level synthesis
  - High-level languages
  - Design tools
- Hybrid architectures (~1 week)
  - Hybrid architectures
  - Communication
  - Hw/sw partitioning
  - Soft-core microprocessors
- System architectures (2-3 weeks)
  - System design strategies
  - System services
  - Small-scale architectures
  - HPC architectures
  - HPEC architectures
  - System synthesis
  - Architectural design space explorations
- Case Studies (~1 week)
  - Signal and image processing
  - Bioinformatics
  - Security
- Special Topics (~2 weeks)
  - Partial Reconfiguration
  - Numerical Analysis
  - Performance Analysis/Prediction
  - Fault Tolerance

## 1. Course number and name: EEL 4744C - Microprocessor Applications

- 2. Credits and contact hours: 4 crs; 3 classes of 50 minutes each and 1 laboratory section of 3 hours per week
- 3. Instructor's or course coordinator's name: Dr. Tao Li
- 4. **Text book, title, author, and year:** Fredrick M. Cady & James M. Sibigtroth, *Software and Hardware Engineering*, latest edition; Fredrick M. Cady, *Microcontrollers and Microcomputers*, latest edition
  - a. other supplemental materials: None

### 5. Specific course information

- a. catalog description: Elements of microprocessor-based systems; hardware interfacing and software design for their application. Laboratory
- b. prerequisites: EEL 3701 Digital Logic and Computer Systems
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Required

### 6. Specific goals for the course

- a. specific outcomes of instruction: The student will understand the functional and technological characteristics of microprocessor structures, memory components, peripheral support devices, and interface logic.
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, c, e, g, k

- a. Introduction
- b. Programming Model and Addressing Models
- c. 68HC12 Instruction Set, Design, Programming
- d. Computer Buses and Parallel I/O
- e. Interrupts and Real-Time Events
- f. Memory concepts and interfacing
- g. Timers
- h. Serial I/O
- i. Analog I/O

- 1. Course number and name: EEL 4750C Introduction to Digital Signal Processing
- 2. Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each
- 3. Instructor's or course coordinator's name: Dr. Fred Taylor
- 4. Text book, title, author, and year: R. Chassaing, *Digital Signal Processing with Applications with the C6713 and C6416 DSK*, Wiley, latest edition
  - a. other supplemental materials: None

- a. catalog description: Fundamentals of filter design and Fourier transforms. Hardware implementation of filters. Simulation of signal processing systems using MATLAB
- b. prerequisites: EEL 3135 Signals and Systems, EEL 4744 Microprocessor Applications
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Selected Elective

### 6. Specific goals for the course

- a. specific outcomes of instruction: The student will understand the fundamentals of digital signal processing (DSP) theory and practice as required of an entry-level DSP engineer.
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, e, k

- a. Signals and signal taxonomy
- b. Sampling theorem and aliasing, MATLAB studies
- c. Analog to digital and digital to analog conversion, and signal generation, DSK sampling project
- d. z-transform signal and system representation, MATLAB studies
- e. Discrete Fourier Transform, MATLAB studies, and DSK Fourier project
- f. Linear system properties and behavior, MATLAB studies
- g. Finite impulse response filters (FIR), MATLAB studies, and DSK FIR project
- h. Infinite impulse response filters (IIR), MATLAB studies
- i. IIR architectures, state variable representation, MATLAB studies, and DSP IIR project.
- j. Survey or advanced DSP applications, concepts and technology (adaptive filters, multi-rate, technology)

- 1. Course number and name: EEL 4924 Electrical & Computer Engineering Design 2
- **2.** Credits and contact hours: 3 crs; 3 classes per week of 50 minutes each, open laboratory
- 3. Instructor's or course coordinator's name: Dr. Karl Gugel
- 4. Text book, title, author, and year: None
  - b. other supplemental materials: None
- 5. Specific course information
  - a. catalog description: Selected design projects involving engineering applications in the various areas of Electrical Engineering. Must be taken prior to the semester of graduation. Laboratory
  - b. prerequisites or co-requisites:
  - c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Required for CEE students. CEN students take CIS 4912.

### 6. Specific goals for the course

- c. specific outcomes of instruction: The student will have an understanding of how a design project goes from written proposal through implementation, technical documentation, and oral presentation of the completed design project all while meeting various deadlines.
- d. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: a, b, c, d, e, f, g, h, i, j, k

- a. IEEE Code of Ethics
- b. Design project abstract
- c. Design proposal
- d. Project progress meetings presented weekly
- e. Design patent checked weekly
- f. Project technical report
- g. Project marketing presentation
- h. Project demonstration

- 1. Course number and name: EGN 1935 ECE Adventures
- 2. Credits and contact hours: 2 crs; 1 class per week of 2 hours
- 3. Instructor's or course coordinator's name: Dr. Eric M. Schwartz
- **4.** Text book, title, author, and year: Fred Martin, *The 6.270 Robot Builder's Guide*, MIT Media Lab, Cambridge, MA, 1992, downloadable from website
  - a. other supplemental materials: Joseph Jones, Bruce Seiger & Anita Flynn, *Mobile Robots: Inspiration to Implementation*, 2nd edition, A.K. Peters Publishers, Natick, MA, 1998. Fred Martin, *Robotic Explorations*, Prentice-Hall, 2001

- a. If you are unsure of your major or would like to learn about potential experiences of an Electrical and Computer Engineering student, this course is for you! In EGN 1935 you'll learn about robots and experiment with sensors and actuators. This process will help you discover many basic ECE concepts. Grades are based on attendance and class participation. No exams
- b. prerequisites: Freshman or Sophomore Standing
- c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: not in the program (included for reference; Computer Engineering students sometimes take it as a exploratory course)

### 6. Specific goals for the course

- a. specific outcomes of instruction: The student will have a basic knowledge of the fundamentals components and tools used by Electrical and Computer Engineers.
- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.: not applicable (not in the CE program)

- a. Power supplies, batteries, multi-meters, oscilloscopes, waveform generators, soldering, hand tools, rudimentary robot programming.
- b. Proto-boards, switches, LEDs, resistors, bump sensors, pull-up/down resistors.
- c. Voltage divider, CdS cells, potentiometers.
- d. IR, modulated IR emitter/detectors, PWM signals, DC motors, servos.
- e. Other sensors, actuators, simple behavior software
- f. Intermediate robot programming, behavior creation and arbitration.
- g. Piezo speakers, sound generation, digital signals, sampled data, sampling frequency, sonar.
- h. Cameras, magnetic sensors, laser bump, modern sensors and actuators, radio frequency, ICs

# Appendix B1 – Faculty Vitae (CISE Faculty)

All academic and non-academic experience is full-time unless indicated otherwise.

# Name: ARUNAVA BANERJE

Education: Ph.D, Computer Science, Rutgers, The State University of New Jersey, 2001

## Academic experience:

• University of Florida, CISE, Associate Professor (2009- Present)

## Non-academic experience: none

### Certifications or professional registrations: none

## Current membership in professional organizations: IEEE, Society for Neuroscience

### Honors and awards:

• 2000-2001 Rutgers Graduate School Research Award

## Service activities:

• Faculty Advisor for Indian Students Association, University of Florida

## Most important publications and presentations from the past five years:

- N D. VanderKraats, and Arunava Banerjee, A. (2011). A finite-sample, distribution-free, probabilistic lower bound on mutual information. *Neural Computation*, *23*, 1862–98.
- Ritwik Kumar, Angelos Barmpoutis, Arunava Banerjee, and Baba C. Vemuri (2010) Non-Lambertian Reflectance Modeling and Shape Recovery of Faces using Tensor Splines, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, (in press).
- Karthik S. Gurumoorthy, Ajit Rajwade, Arunava Banerjee, and Anand Rangarajan (2010) A Method for Compact Image Representation using Sparse Matrix and Tensor Projections onto Exemplar Orthonormal Bases. *IEEE Transactions on Image Processing*, 19(2), pp. 322-334.
- Karthik S. Gurumoorthy, Arunava Banerjee, and Anand Paul (2009) Dynamics of 2worker bucket brigade assembly line with blocking and instantaneous walk-back. *Operations Research Letters*, 37(3), pp. 159-162.
- Ajit Rajwade, Arunava Banerjee, and Anand Rangarajan (2008) Probability Density Estimation using Isocontours and Isosurfaces: Application to Information Theoretic Image Registration. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 31(3), pp. 475-491.
- Arunava Banerjee, Peggy Series, and Alexandre Pouget (2007) Dynamical Constraints on using Precise Spike Timing to Compute in Recurrent Cortical Networks. *Neural Computation*, 20(4), pp. 974-993.
- Arunava Banerjee, and Anand Paul, (2007) On Activity Correlation and PERT Bias. *European Journal of Operational Research*, 189(3), pp. 1208-1261.
- Arunava Banerjee, Janice E. Carrillo, and Anand Paul (2007) Projects with Sequential Iteration: Models and Complexity. *IIE Transactions*, 39, pp. 453-463.

Most recent professional development activities: see service activities above

# Name: MANUEL BERMUDEZ

Education: Ph.D., Computer and Information Science, Univ. of California, Santa Cruz, 1984

## Academic experience:

- University of California Santa Cruz, Visiting Assistant Professor, 1984-85
- University of Florida, Assistant Professor, 1985-1990
- University of Florida, Associate Professor, 1990-present

### Non-academic experience: none

### Certifications or professional registrations: none

## Current membership in professional organizations: none

### Honors and awards:

- UF Teaching Improvement Award, 1995.
- Fulbright Scholar, visiting University of Costa Rica, 1996-97.
- Fulbright Scholar, visiting Universidad de los Andes, Venezuela, 2003-04.
- Honorary Doctorate, Universidad Particular de Chiclayo, Chiclayo, Perú, April 21, 2008
- Invited Speaker, "El Futuro de la Acreditación: La Perspectiva de ABET" at Jornada Informáticos de Calidad; Generando Competitividad Internacional, a seminar organized by SINAES (Sistema Nacional de Acreditación de la Educación Superior), Nov. 28, 2008, San José, Costa Rica.
- Keynote Speaker, V COREIS (Congreso Regional de Estudiantes de Ingeniería de Sistemas), Universidad de Chiclayo, Chiclayo, Perú, April 21, 2008.
- Keynote Speaker, VII Congreso Internacional de Ingeniería Electrónica y Tecnologías Avanzadas - CIETA, III Congreso Internacional en Sistemas, Informática e Ingeniería del Conocimiento, Pamplona, Colombia, November 17-21, 2009.
- Keynote Speaker, Congreso Regional de Estudiantes de Ingenieria de Sistemas, Chiclayo, Peru, April 28-30, 2010.
- Recipient of the Distinguished Visitor Medal, Universidad Santo Toribio de Mogrovejo, Chiclayo, Peru, April 30, 2010.

## Service activities:

- Member, Admissions Committee, CISE Dept.
- Member, ABET Committee, CISE Dept.
- Systems Area Coordinator, Ph.D. Qualifying Exam Committee, CISE Dept.
- Guest Editor, CLEI Electronic Journal, for special edition following co-Chairman position for CLEI (Centro Latinoamericano de Educación en Informática) conference in 2007.
- Program Committee co-Chair, CLEI (Centro Latinoamericano de Educacion en Informatica), Costa Rica, 2007.
- Program Committee Chair, LACCEI (Latin American and Caribbean Consortium of Engineering Institutions), 2007, 2009, 2010, 2011.

- Member, DOD SMART (Science, Mathematics and Research for Transformation Defense) Scholarship for Service Evaluation Panel, Washington, DC, January 25, 2008, 2009, 2010.
- Member, International Accreditation visit team, to evaluate the Systems Engineering program at the Universidad Interamericana de Costa Rica, sponsored by SINAES (Sistema Nacional de Acreditación de la Educación Superior de Costa Rica), Nov. 24-28, 2008. Chair, International Accreditation visit team, 2009.
- Panel member, National Science Foundation Graduate Research Fellowship Program, Washington DC, February 5-7, 2009. Panel member, 2010. Panel Chair, 2011.
- Panel member, National Science Foundation CSR Small Panel (Operating Systems and Compilers), Washington DC, March 11-12, 2010.

# Most important publications and presentations from the past five years:

- Carl Crane and Manuel E. Bermudez, "The Autonomous Vehicle Program at the University of Florida", proceedings of the Fifth Latin American and Caribbean Conference for Engineering and Technology, May 29, June 1, 2007, Tampico, Mexico
- Manuel E. Bermudez, "Computer-Assisted Process Planning in Manufacturing: A Casestudy in University-Industry Cooperation", Proceedings of the 7th Annual LACCEI Conference, Tegucigalpa, Honduras, June 4-6, 2008, pp. 1-9.
- Manuel E. Bermudez, "Adding Part Features to a Computer-Assisted Manufacturing Process Planning System: A Continuing Case-study in University-Industry Cooperation", Proceedings of the 8th Annual LACCEI Conference, San Cristobal, Venezuela, June 2-5, 2009, pp. 1-9.

# Most recent professional development activities:

- Taught many short courses on Software Engineering, Compiler Construction in Latin America,
- Have given over 40 invited talks in Latin America.
- Have served as faculty coach on eight IPPD projects.
- see also service activities above

# Name: SHIGANG CHEN

Education: University of Illinois at Urbana-Champaign, Ph.D. in CS, May 1999

### Academic experience:

- Associate Professor, CISE, U. of Florida, 2008 present
- Assistant Professor, CISE, U. of Florida, 2002 2008

## Non-academic experience:

- Technical Advisor, Protego Networks, Advisory Board, Network Security, 2002 2003
- Senior Software Engineer, Cisco Systems, Network Security, 1999 2002

### Certifications or professional registrations: none

### Current membership in professional organizations: IEEE, ACM

### Honors and awards:

- NSF CAREER Award, 2007
- IEEE Communications Society Best Tutorial Paper Award, 1999

## Service activities:

- Member of the Steering Committee for IEEE IWQoS
- Area co-chair for Network and Data Communications Track of the 10th International Symposium on Pervasive Systems, Algorithms and Networks (I-SPAN), 2009
- TPC co-chair for Computer and Network Security Symposium, ACM International Wireless Communications and Mobile Computing Conference (IWCMC), 2009
- TPC co-chair for the 17th IEEE International Workshop on Quality of Service (IWQoS), 2009
- Guest editor for Journal of Advances in Multimedia, Special Issue on Towards the Next Generation Peer-to-Peer Services, 2007
- Guest editor for IEEE Transactions on Vehicle Technologies, Special Section on Crosslayer Design in Mobile Ad Hoc Networks and Wireless Sensor Networks, 2005
- Guest editor for ACM/Baltzer Journal of Wireless Networks (WINET), Special Issue on Wireless Quality-of-Service Support, 2005
- Track co-chair for Wireless and Mobile Network Architecture of 16th International Conference on Computer Communications and Networks, 2007
- TPC co-chair for Computer and Network Security Symposium of IEEE International Wireless Communication and Mobile Computing Conference (IWCCC), 2006
- Vice general chair for Second International Conference on Quality of Service in Heterogeneous Wired/Wireless Networks, 2005
- TPC vice chair for the Second IEEE International Conference on Mobile Adhoc and Sensor Systems (MASS'05), 2005
- TPC co-chair for First International Conference on Quality of Service in Heterogeneous Wired/Wireless Networks, 2004
- TPC member for INFOCOM'11, ICDCS'11, QShine'11, INFOCOM'10, ICCCN'10,

MASS'10, ICC'10, GLOBECOM'10, RTSS'09, ICCCN'09, INFOCOM'09, ChinaCom'08, SecureCom'09, INFOCOM'08, ACST'08, GLOBECOM'07, SAWN'07, WCNC'07, ICNP'06, MTUC'06, MultiSec'05, INFOCOM'05, WiQoS'05, SANS'05, ISCC'05, ACST'04, COQODS'04, GLECOM'04, ISCC'04, CNIS'03, CST'03, ICNP'01

- Keynote speaker for the 3rd China Wireless Sensor Networks, SuZhou, China, 2009
- NSF review panelist for five times
- Session chair in INFOCOM'09, ICDCS'08, INFOCOM'05 and INFOCOM'04

## Most important publications and presentations from the past five years:

- Tao Li, Shigang Chen, Yibei Ling, Fast and Compact Per-Flow Traffic Measurement through Randomized Counter Sharing, in Proc. of IEEE INFOCOM'10, Shanghai, China, April, 2011.
- Tao Li, Shigang Chen, Wen Luo, Ming Zhang, Scan Detection in High-Speed Networks Based on Optimal Dynamic Bit Sharing, in Proc. of IEEE INFOCOM'10, Shanghai, China, April, 2011.
- Zhuo Huang, Jih-Kwon, Shigang Chen, Approximately-Perfect Hashing: Improving Network Throughput through Efficient Off-chip Routing Table Lookup, in Proc. of IEEE INFOCOM'10, mini-conference, Shanghai, China, April, 2011.
- Zhuo Huang, David Lin, Jih-Kwon Peir, Shigang Chen, S. M. Iftekharul Alam, Fast Routing Table Lookup Based on Deterministic Multi-hashing, in Proc. of IEEE International Conference on Network Protocols (ICNP'10), Kyoto, Japan, October 2010.
- Myungkeun Yoon, Tao Li, Shigang Chen, Jih-kwon Peir, Fit A Spread Estimator in A Small Memory, in Proc. of IEEE INFOCOM'09, Rio de Janeiro, Brazil, April 2009. (The journal version is directly accepted by IEEE/ACM Transactions on Networking after the first round of reviews.)
- MyungKeun Yoon, Shigang Chen, Zhan Zhang, Minimizing the Maximum Firewall Rule Set in a Network with Multiple Firewalls, IEEE Transactions on Computers, vol. 59, no. 2, pp. 218-230, February 2010.
- Tao Li, Shigang Chen, Yibei Ling, Identifying the Missing Tags in a Large RFID System, in Proc. of ACM Mobihoc, Chicago, IL, USA, September, 2010.
- Shigang Chen, Meongchul Song, Sartaj Sahni, Two Techniques for Fast Computation of Constrained Shortest Paths, IEEE/ACM Transactions on Networking, vol. 16, no. 1, pp. 105-115, February 2008
- Ying Jian, Shigang Chen, Can CSMA/CA Networks be Made Fair? in Proc. of ACM MobiCom, San Francisco, California, USA, September 2008.
- Shigang Chen, Zhan Zhang, Localized Algorithm for Aggregate Fairness in Wireless Sensor Networks, in Proc. of ACM MobiCom, Los Angeles, California, USA, September 2006.

Most recent professional development activities: see service activities above

# Name: RANDY Y. C. CHOW

Education: PhD, Computer Science, Univ. of Massachusetts, 1977.

### Academic experience:

- University of Florida, CISE, Professor, 1988 present, full time
- University of Florida, CISE, Associate Professor, 1981 1988, full time
- Wright State University, Assistant Professor, 1977 -1981, full time

### Non-academic experience:

- NSF, Program Director, 2001 2003, full time
- IBM, Faculty Associate, Summer 1983, full time

### Certifications or professional registrations: none

## Current membership in professional organizations:, IEEE Computer Society, ACM

### Honors and awards:

### Service activities:

- Program Committee 2011 Int. Conf. On Network and Parallel Computing
- Program Committee 2010 Int. Conf. On Network and Parallel Computing
- Editor 2002-9 Journal of Information Science and Engineering
- Program Committee 2008 International Conference on GDC
- Program Committee 2007-8 IASTED/Advanced Computer Science and Technology
- Committee of Visitors 2006 CNS/CISE/NSF
- Keynote Speaker 2006 39<sup>th</sup> Annual Simulation Symposium
- Program Committee 2006 ASTED/Advanced Computer Science and Technology
- Program Committee 2004 International Symposium on ADS
- Program Chairman 2003 International Workshop on FTDCS
- Program Director 2001-3 NSF

## Most important publications and presentations from the past five years:

- <u>Hassan Rasheed</u>\* and <u>Randy Chow</u>, "Dynamic Risk Thresholds for Access Control Restriction Using Real Time Data on Vulnerability Exploitation," *International Journal on Network Security*, accepted with minor revision, to appear in 2011.
- <u>Lu Chen\*</u> and <u>Randy Chow</u>, "Building a valid Web Service Composition Using Integrated Service Substitution and Adaptation," *International Journal of Information and Decision Sciences*, Special Issue on IRI, Vol. 2, No.2, pp. 113-131, February 2010.
- <u>Y. Ling\*, S. G. Chen</u>, and <u>R. Chow</u>, "AID: A Global Anti-DoS Service," *Computer Networks Journal*, Vol. 51, pp.4252-4269, October 2007.
- <u>S. Chen, C. Choo\*</u>, and <u>R. Chow</u>, "Internet Security: A Novel Role/Object-Based Access Control for Digital Libraries," *Journal of Organizational Computing and Electronic Commerce*, Vol. 16(2), pp. 87-103, April 2006.

- <u>Z. Zhang\*, S. Chen</u>, Y. Ling, and R. Chow, "Capacity-Aware Multicast Algorithms on Heterogeneous Overlay Networks," *IEEE Transactions on Parallel and Distributed Systems*, Vol. 17(2), pp. 135-147, February 2006.
- <u>Hungju Chu\*</u> and <u>Randy Chow</u>, "An Information Model for Managing Knowledge via Faceted Taxonomies," *IEEE International Conference on Information Reuse and Integration*, pp. 378-370, August 2010.
- <u>Lu Chen</u>\*, Yan Li\*, and <u>Randy Chow</u>, "Enhancing Web Service Registries with Semantics and Context Information," *IEEE International Conference on Service Computing*, pp. 641-644, July 2010.
- <u>Xiao Li\*</u> and <u>Randy Chow</u>, "An Ontology-based mapping Repository for Meta-Querier Customization," *Proceedings of the 22<sup>nd</sup> International Conference on Software Engineering and Knowledge Engineering* (SEKE 2010), pp. 325-330, July 2010.
- <u>Lu Chen\*</u> and <u>Randy Chow</u>, "A Web Service Similarity Framework Using Automata Comparison," *International Conference on Information Systems, Technology and Management (ICISTM-10)*, pp. 44-55, March 2010.
- <u>Piyush Harsh\*</u>, <u>Randy Chow</u>, and Richard Newman, "Gray Networking: A Step toward Next Generation Computer Networks," *ACM SAC'10*, pp. 1321-1328, March 2010.
- <u>Xiao Li</u>,\* <u>Randy Chow</u>, and Lu Chen\*, "Dynamic Personalization of Meta-Queriers," *IEEE International Conference on Information Reuse and Integration*, pp. 361-365, August 2009.
- <u>H. Rasheed\*</u> and <u>R. Chow</u>, "Adaptive Risk-Aware Application-Level Access Control," *SAM'09, International Conference on Security and Management*, July 2009.
- <u>H. Rasheed\*</u> and <u>R. Chow</u>, "Automated Risk Assessment for Sources and Targets of Vulnerability Exploitation," *IEEE World Congress on Computer Science and Information Engineering*, pp. 150-154, March 2009.
- <u>L. Chen\*</u> and <u>R. Chow</u>, "Web Service Composition Based on Integrated Service Substitution and Adaptation," *IEEE International Conference on Information Reuse and Integration*, pp. 34-39, July 2008.
- <u>H. Rasheed\*</u> and <u>R. Chow</u>, "An Information Model for Security Integration," *IEEE Workshop on Future Trends of Distributed Computing Systems*, pp. 41-47, March 2007.
- <u>H. Chu\*</u> and <u>R. Chow</u>, "Reaching Semantic Interoperability through Semantic Association of Domain Standards," *IEEE Workshop on Future Trends of Distributed Computing Systems*, pp. 15-19, March 2007.

# Most recent professional development activities:

- Faculty Enhancement Opportunity, Summer 2009; Sabbatical, Spring 2005
- See also service activities above

# Name: DOUGLAS DANKEL II

Education: Ph.D., Computer Science, University of Illinois Urbana-Champaign, 1980

## Academic experience:

- Assistant Professor, University of Florida, 1979, present, full time
- Lektor, University of Akureyri, Iceland, 2003-2005, full time

# Non-academic experience:

- Graduate Engineer, 5/73-8/73, IBM, Raleigh, NC, full time
- Programmer, 5/74-7/74, Northern European University Computing Center, Lyngby, Denmark, full time
- Visiting Researcher, 5/90-12/90, 5/91-8/91, 5/92-8/92, BNR, Research Triangle Park, NC, full time
- Assistant for Internal Courses, 12/80, 1/81, IBM, part time
- Instructor for Internal Courses, 10/81, 11/81, 5/82, 10/82, 11/82, 7/83, 8/83, 10/83, 4/84, 5/85, 6/85, 11/85, 7/86, 8/86, 6/87, 7/87, 6/88, 10/88, 3/89, 3/90, 10/90, 2/91, IBM, part time

# Certifications or professional registrations: none

**Current membership in professional organizations:** AAAI, ACM: IEEE, FLAIRS (Florida Artificial Intelligence Research Society)

## Honors and awards:

- Finalist in "The Campus Award for Excellence in Undergraduate Teaching", Univ. of Illinois, Urbana, Illinois, 1976
- Co-Winner of "Teacher of the Year in the College of Engineering", Univ. of Florida, Gainesville, FL, 1985
- Outstanding Instructor Award, National Technical University: 1989, 1990, 1991, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001
- T.I.P. (Teaching Incentive Program) Award, 1994, 1998

# Service activities:

- Departmental committees: Curriculum Committee
- Reviewer: CIGCSE Conference, Canadian AI Conference, ITiCSE Conference, FLAIRS Conference, Transactions on Systems, Man, and Cybernetics, Part A, WMSCI-2006, Review for RANNIS (funding agency in Iceland)
- Program Chairman: The 10<sup>th</sup> International Florida Artificial Intelligence Research Symposium, May 12-14, 1997, Daytona Beach, FL
- General Co-Chairman: The 9<sup>th</sup> Florida Artificial Intelligence Research Symposium, May 20-22, 1996, Key West, FL
- General Chairman: The 14<sup>th</sup> International Artificial Intelligence Research Symposium, 2001, Key West, FL
- Vice President, Florida Artificial Intelligence Research Society, 1996 1997
- President, Florida Artificial Intelligence Research Society, 1997 2012

## Most important publications and presentations from the past five years:

- Y. Namkoong\*, Y. Joo, and D. D. Dankel, "Feature Subset-wise Mixture Model-based Clustering via Local Search Algorithm", Canadian AI 2010, The 23<sup>rd</sup> Canadian Conference on Artificial Intelligence, Ottawa, Ontario, Canada, May 31 June 2, 2010, pp. 135 146
- Y. Namkoong\*, D. D. Dankel, and Y. Joo, "Partitioning Features for Model-based Clustering Using Reversible Jump MCMC Technique", FLAIRS-23, The International FLAIRS Conference, Daytona Beach, FL, May 19-23, 2010, pp. 152-153.
- Y. Namkoong\*, Y. Joo, and D. D. Dankel, "Feature-Subset-Specific Clustering Using Stochastic Search", ENAR (Eastern North American Region) International Biometric Society Spring Meeting, New Orleans, LA, March 21-24, 2010
- J. D. Schipper\*, J. L. Schauben, D. D. Dankel II, A. A. Arroyo, and D. R. Sollee, "A Knowledge-Based Consultant for Human Toxic Exposures" in <u>Clinical Toxicology</u> (The Official Journal of the American Academy of Clinical Toxicology, European Association of Poisons Centres and Clinical Toxicologists, and American Association of Poison Control Centers), vol. 47, Number 5. London, UK, June 2009, pp. 465-466
- J. D. Schipper\*, J. L. Schauben, D. D. Dankel II, A. A. Arroyo and D. R. Sollee, "Differential Toxicological Diagnoses by Using A Knowledge-Based Computerized Models", Clinical Toxicology (The Official Journal of the American Academy of Clinical Toxicology, European Association of Poisons Centres and Clinical Toxicologists, and American Association of Poison Control Centers), Volume 46, Number 7, M.A. McGuigan, Ed., London, UK, August 2008, p. 612.
- Crane, D. Armstrong, A. Arroyo, A. Baker\*, D. D. Dankel, G. Garcia\*, N. Johnson\*, J. Lee\*, S. Ridgeway, J. Schueller, E. Schwartz, E. Thorn\*, S. Velat\*, and J. H. Yoon\*, "Experiences from the 2007 DARPA Urban Challenge and Implications for Heavy Vehicle Autonomy", CIGR International Conference of Agricultural Engineering, XXXVII Congresso Brasileiro de Engenharia Agrícola CONBEA 2008, Brazil, August 31 to September 4, 2008, 6 pages
- Crane, D. Armstrong, A. Arroyo, A. Baker\*, D. Dankel, G. Garcia\*, N. Johnson\*, J. Lee\*, S. Ridgeway, E. Schwartz, E. Thorn\*, S. Velat\*, and J. H. Yoon\*, "Lessons Learned at the DARPA Urban Challenge", 2008 Florida Conference on Recent Advances in Robotics, FIT, Melbourne, Florida, May 8-9, 2008
- J. Magnusson\*, and D. Dankel, "Proactive Database Index Tuning Through Data Threshold Prediction", 47<sup>th</sup> ACM Southeast Conference, Clemson, SC, March 19-21, 2008
- D. Dankel II and J. Ohlrich\*, "Students Teaching Students: Incorporating Presentations into a Course", SIGCSE-07, Covington, KY, March 2007

# Most recent professional development activities:

- Workshop on Incorporating Machine Learning in an Introductory AI Course, FLAIRS-2009
- See also service activities above

# Name: TIMOTHY DAVIS

Education: PhD, Electrical Engineering, University of Illinois at Urbana-Champaign, 1989

# Academic experience:

- University of Florida, CISE, Professor, Aug. 2007 to date, full time
- Stanford University, Visiting Associate Professor, Aug. 2002 to May 2003, full time
- University of Florida, CISE, Associate Professor, Aug. 1996 to Aug. 2007, full time
- University of Florida, CISE Assistant Professor, Dec. 1990 to Aug. 1996, full time
- CERFACS, Toulouse, France, post-doctoral researcher, Oct. 1989 to Dec. 1990, full time

## Non-academic experience:

- Lawrence Berkeley National Lab, Visiting Staff Member, Aug. 2002 to May 2003
- General Electric Corporate Res. & Dev., Summer Intern, 1984 and 1985
- RCA, Cooperative Education Student Intern, 1980-1983 (2 calendar years total) (all the above are full-time)

# Certifications or professional registrations: Engineering in Training, 1983

# Current membership in professional organizations: SIAM, ACM

## Honors and awards:

- Google Open Source Software Award (\$5000), May 1, 2012
- American Electronics Associate Fellowship, 1984 to 1989
- CISE Department Teacher of the Year Award, 1994
- NVIDIA Academic Partner, 2011 (\$25,000 gift, plus \$4,000 GPU card)
- Google Open Source Software Award (Google Summer of Code), 2011

## Service activities:

- Associate Editor, ACM Trans. on Mathematical Software, Sept. 2008 to date
- Associate Editor, Computational Optimization and Applic., Sept. 2005 to date
- Chair, University of Florida College of Engineering Faculty Council, 2007 2008
- University of Florida Faculty Senate, 2002-2008
- Elected Member of SIAM Council, 2007 to date
- SIAM Council representative to the SIAM Board of Trustees, 2010 to date
- College of Engineering Awards Committee
- NSF Panelist (multiple occasions)

## Most important publications and presentations from the past five years:

- Direct Methods for Sparse Linear Systems, T. A. Davis, SIAM, Philadelphia, Sept. 2006. Part of the SIAM Book Series on the Fundamentals of Algorithms.
- MATLAB Primer, 8th edition T. A. Davis. CRC Press, 2011.
- The University of Florida Sparse Matrix Collection T. A. Davis and Y. F. Hu, in ACM Transactions on Mathematical Software, Vol 38, Issue 1, 2011.

- Algorithm 915: SuiteSparseQR Multifrontal multithreaded rank-revealing sparse QR factorization, T. A. Davis, ACM Trans. on Mathematical Software, Vol 38, Issue 1, 2011.
- Hypergraph-based unsymmetric nested dissection ordering for sparse LU factorization L. Grigori, E. Boman, S. Donfack, and T. A. Davis, SIAM Journal on Scientific Computing, vol 32, no 6, pp 3426-3446, 2010.
- Algorithm 907: KLU, a direct sparse solver for circuit simulation problems T. A. Davis and E. Palamadai Natarajan, ACM Transactions on Mathematical Software, vol 37, no. 3, 2010.
- Dynamic supernodes in sparse Cholesky update/downdate and triangular solves, T. A. Davis and W. W. Hager, ACM Trans. Math. Software, Vol 35, No. 4, 2009.
- Algorithm 887: CHOLMOD, supernodal sparse Cholesky factorization and update/downdate, Y. Chen, T. A. Davis, W. W. Hager, and S. Rajamanickam, ACM Trans. Math. Software, Vol 35, No. 3, 2009.
- Dual multilevel optimization, T. A. Davis and W. W. Hager, Mathematical Programming, Vol 112, No. 2, April 2008, pp. 403-425.
- A sparse proximal implementation of the LP Dual Active Set Algorithm, T. A. Davis and W. W. Hager, Mathematical Programming, Vol 112, No. 2, April 2008, pp. 275-301.

# Most recent professional development activities:

- SCEE 2010 (Supercomputing in Electrical Engineering), Toulouse, France
- Invited talk at University of Michigan, Aug. 2010
- SIAM Annual Meetings
- Invited talk at Florida State University, May 2010
- Master Consultant to The MathWorks (I am the author of x=A\b in MATLAB when A is sparse), including a 500-hour assignment in the Summer of 2007.
- Consultant to Accelogic, Inc.
- Consultant to Mentor Graphics, Inc.
- Faculty Advisor for Cornerstone Robotics Team (high-school), 2010. The team won 1<sup>st</sup> placed in an international competition (Technology Student Association), 2010, in Baltimore, Maryland
- Results of research (mathematical software) incorporated into dozens of commercial software packages and distributed commercially, including MATLAB, Mathematica, MSC Nastran, Cadence, ANSYS, IBM, Berkeley Design Automation (circuit simulation), Geomodeling Solutions, Orcina, ATopTech, Tandent Vision Science, SIMetrix, Mentor Graphics, and countless open-soruce packages such as the Xyce circuit simulation package (Sandia National Labs).
- See also service activities above

# Name: ALIN DOBRA

Education: PhD, Cornell University, 2003

### Academic experience:

- Department of CISE, University of Florida, Associate Professor, 2009 present
- Department of CISE, University of Florida, Assistant Professor, 2003-2009

### Non-academic experience: none

### Certifications or professional registrations: none

### Current membership in professional organizations: ACM

### Honors and awards:

- Best paper award, SIGMOD 2007 conference
- NSF CAREER Award: New Technologies for Approximate Query Processing, 2005-2010

### Service activities:

- Organizer of First Bertinoro Workshop on Data-mining (October 2005)
- Internal: chair of facilities committee (2008-now)
- Program committee member for ACM CIKM 2003, ACM SIGKDD 2004, ACM CIKM 2004, IEEE ICDE 2004, IEEE ICDM 2005, VLDB 2005, ICDE 2005, SIGMOD 2006, KDD 2006, KDD 2007, SDM 2007, VLDB 2007, SIGMOD 2008, SIGMOD 2010, EDBT 2011, ICDE 2011 (area chair), ICDM 2011

## Most important publications and presentations from the past five years:

- Subramanian Arumugam, Alin Dobra, Chris Jermaine, Luis Perez, Niketan Pansare, "The DataPath System: A Data-Centric Analytic Processing Engine for Large Data Warehouses." SIGMOD 2010
- Alin Dobra, Chris Jermaine, Florin Rusu, Fei Xu, "Turbo-Charging Estimate Convergence in DBO". VLDB 2009
- Christopher M. Jermaine, Subramanian Arumugam, Abhijit Pol, Alin Dobra: "Scalable approximate query processing with the DBO engine". SIGMOD 2007
- Florin Rusu, Alin Dobra: "Statistical analysis of sketch estimators." SIGMOD 2007
- Florin Rusu and Alin Dobra, "Fast range-summable random variables for efficient aggregate estimation", SIGMOD 2006

## Most recent professional development activities:

- Developed DBO, a database system with statistical guarantees (2006-2009)
- Developed DataPath, a high-performance database system (2009-now)
# Name: ALIREZA ENTEZARI

Education: PhD, Computing Science, Simon Fraser University, 2007

#### Academic experience:

• University of Florida, CISE, Assistant Professor, 2007 – present

#### Non-academic experience:

- Simon Fraser University, Research Assistant, 2001-2007
- McKesson (ALI Technologies) Medical Imaging, Research and Development, 1999-2001
- Eyeball networks, Research and Development, 1998-1999

## Certifications or professional registrations: none

#### Current membership in professional organizations: IEEE

#### Honors and awards:

• Natural Sciences and Engineering Research Council (NSERC) of Canada Fellowship, ranked 6<sup>th</sup> nation-wide

#### Service activities:

- Facility, Graduate admission committees in the CISE department.
- Served on National Science Foundation and Department of Energy review panels
- Organized workshop on sampling and reconstruction in Banff Intl. Research Station.

## Most important publications and presentations from the past five years:

- Mahsa Mirzargar, Alireza Entezari, "Voronoi Splines", IEEE Transactions on Signal Processing (TSP), vol. 58, no. 9, pp. 4572-4582, 2010.
- Bernhard Finkbeiner, Alireza Entezari, Dimitri Van De Ville, Torsten Moeller, "Efficient Volume Rendering on the Body Centered Cubic Lattice Using Box Spline", Journal of Computers And Graphics (CAG), vol. 34, no. 4, pp. 409-423, 2010.
- Alireza Entezari, Mahsa Mirzargar, Leila Kalantari, "Quasi-interpolation on the Body Centered Cubic Lattice", Journal of Eurographics Association, Computer Graphics Forum, vol. 28, no. 3, pp. 1015-1022, 2009. (Presented at EuroVIS Conference.
- Usman Alim, Alireza Entezari, Torsten M<sup>\*</sup>oller, "The Lattice-Boltzmann Method on Optimal Sampling Lattices", IEEE Transactions on Visualization and Computer Graphics, vol. 15, no. 4, pp. 630-641, 2009.
- Minho Kim, Alireza Entezari, J'org Peters, "Box Spline Reconstruction On The Face Centered Cubic Lattice", IEEE Transactions on Visualization and Computer Graphics, vol. 14, no. 6, pp. 1523-1530, Nov/Dec 2008
- Alireza Entezari, Dimitri Van De Ville and Torsten M'oller, "Practical Box Splines for Reconstruction on the Body Centered Cubic Lattice", IEEE Transactions on Visualization and Computer Graphics, vol. 14, no. 2, pp. 313-328, March/April 2008.

# Name: PAUL FISHWICK

Education: University of Pennsylvania, Computer and Information Science, PhD 1986

#### Academic experience:

- University of Florida, CISE, Professor, 1998 to date
- University of Florida, CISE, Associate Professor, 1991 1998 (tenured)
- University of Florida, CISE, Assistant Professor, 1986 1991 (tenure accruing)
- University of Pennsylvania, Research Assistant, 1984 1986 (non-tenure accruing)
- University of Pennsylvania, Teaching Assistant, 1983 1984 (non-tenure accruing)

#### Non-academic experience:

- NASA Langley Research Center, Systems Analyst, 1981 1983
- Newport News Shipbuilding & Dry Dock Co, Programmer Analyst, 1978 1981

## Certifications or professional registrations: none

## Current membership in professional organizations: ACM, IEEE, SCS

## Honors and awards:

- Best Paper Award, Annual meeting of the Broadcast Education Association. Las Vegas, Nevada.
- Florida Blue Key Society Distinguished Professor (one of four in the University), October 2008.
- SCS Distinguished Lectureship Program (one of seven), April 2006
- KidSim (in conjunction with WSC 2000) Sponsorship Certificate of Appreciation, March 2001.
- Association for Computing Machinery Recognition of Service Award In Appreciation for
- Contributions to ACM, General Chair WSC '00, December 10-13, 2000.
- WSC Distinguished Service Award, December 2000, ``For service as General Chair, Winter Simulation Conference 2000, Orlando, Florida"
- SCS Outstanding Service Award, December 2000, ``For outstanding leadership effort in several conference organizations including the 2000 Winter Simulation Conference and the WEBSIM conference series"
- Elected to Fellow of the Society for Computer Simulation (SCS) February 1998.
- ACM SIGSIM Distinguished Lecturer (one of four), Dec 1998, Multimedia Presentation
- Received a IEEE Certificate of Recognition for an invited three-hour tutorial presented at the 1997 IEEE International Conference on Systems, Man and Cybernetics: Computational Cybernetics and Simulation, Orlando 12-15, 1997.
- Received a Office of Naval Research Certificate of Recognition for Research Contributions made through the 1994 NAVY-ASEE Summer Faculty Research Program, June-August 1994.
- CIS Department Teacher of the Year Award, 1991.
- Awarded Senior Membership in the Institute for Electrical and Electronics Engineers (IEEE) and in the Society for Computer Simulation (SCS), 1991.

- IEEE Computer Society Certificate of Appreciation for Leadership of the Simulation Committee (TCSIM). Two Year Term: June 1988-June 1990.
- Received a National Science Foundation Engineering Research Initiation Award, 1989.
- Received a NASA Certificate of Recognition for data base machine research, 1983

#### Service activities:

- Member Numerous international Conference Program Committees
- Chair of 10 workshops or conferences related to computer simulation
- Served on 12 editorial boards of archival journals

#### Most important publications and presentations from the past five years:

- Park, H. and P. Fishwick, An Analysis of Queuing Network Simulation Using GPU-Based Hardware Acceleration. ACM Transactions on Modeling and Computer Simulation (TOMACS). Accepted (9/14/10).
- Park, H. and P. A. Fishwick. 2010. `` A GPU-Based Methodology and Library Supporting Fast Discrete-Event Simulation", SCS Transactions on Modeling and Simulation, 86(10): 613-628.
- Fishwick, P. 2010. A Decade of Digital Arts and Sciences at the University of Florida, Leonardo, MIT Press, accepted (Nov. 2010).
- Quarles, J., P. A. Fishwick, S. Lampotang, I. Fischler, and B. Lok. 2009. ``A Mixed Reality Approach for Interactively Blending Dynamic Model with Corresponding Physical Phenomena", ACM Transactions on Modeling and Computer Simulation, 20(4): 25 pages.
- Fishwick, P. A. and H. Park. 2008. ``Queuing Modeling", Queue Modeling and Simulation, Principles of Modeling and Simulation: A Multidisciplinary Approach, Sokolowski, J. A. and C. M. Banks, eds, John Wiley and Sons 2008, 71-90.
- Fishwick, P. A. 2007, Editor. ``Handbook of Dynamic System Modeling" CRC Press, 800pp.
- Fishwick, P. A. 2006, Editor. ``Aesthetic Computing" MIT Press, 457pp.

## Name: PAUL GADER

Education: Ph.D., Applied Mathematics, University of Florida, 1986

## Academic experience:

- Professor of CISE, University of Florida, 2003-present
- Associate Professor of CISE, University of Florida, 2001-2003
- Professor of Computer Eng and Computer Sci., Univ of Missouri-Columbia, 2001
- Assoc. Prof of Computer Eng & Computer Sci., Univ of Missouri-Columbia, 1997-2001
- Asst. Prof. of Computer Eng and Computer Sci., Univ of Missouri-Columbia, 1991-1997
- Summer Research Fellow, Image Processing Laboratory, Eglin AFB FL, 1994
- Summer Research Fellow, Institute for Mathematics and Its Applications, Summer Program on Signal Processing, University of Minnesota, 1988
- Assistant Professor of Mathematics, University of Wisconsin-Oshkosh, 1987-1988
- Honorary Fellow, Dept of Mathematics, Univ. of Wisconsin-Madison 1986-1988
- Visiting Assistant Professor of Mathematics, University of Wisconsin-Oshkosh, 1986

## Non-academic experience:

- Consultant, Environmental Research Institute of Michigan (ERIM), 1991-1992
- Section Head and Research Eng., Image and Pattern Analysis Section, ERIM, 1989-1991
- Senior Research Scientist, Machine Vision Technology Section, Honeywell Systems and Research Center, MN, 1986-1988

## Certifications or professional registrations: none

## Current membership in professional organizations: Fellow IEEE, member SPIE

## Honors and awards:

- 2012 UF Research Foundation (UFRF) Professorship.
- Outstanding Junior Faculty Research Award, Presented Annually by University of Missouri-Columbia College of Engineering, March 1996.
- Best Paper Award, IEEE Transactions Fuzzy Systems, 2000.

## Service activities:

- Pattern Recognition for Humanitarian Demining, ICPR Panel, (2002).
- Invited to serve on White House Science Advisor panel on Evaluation of New Technologies for Humanitarian Demining, (2002).
- Assoc Editor, IEEE Geoscience and Remote Sensing Letters (2009 Present)
- Assoc Editor, IEEE Transactions Fuzzy Systems (2004-2007)
- Assoc Editor, Journal of Mathematical Imaging and Vision

# Most important publications and presentations from the past five years:

• Abdallah, H. Frigui, P. D. Gader, "Adaptive Local Fusion with Fuzzy Integrals", IEEE Trans. Fuzzy Systems, (accepted), Jan. 2012.

- Zare, P. D. Gader, and K. S. Gurumoorthy, "Directly Measuring Material Proportions Using Hyperspectral Compressive Sensing", Geoscience & Remote Sensing Let., 2011.
- J. Bolton and P. D. Gader, "Application of Multiple Instance Learning for Hyperspectral Image Analysis", Geoscience & Remote Sensing Letters, (8)5, 2011, pp. 889-893.
- H. Frigui, L. Zhang, P. D. Gader, Joseph N. Wilson, K C Ho, and A. Mendez-Vazquez "An Evaluation of Several Fusion Algorithms for Anti-tank Landmine Detection and Discrimination", Information Fusion (accepted).
- J. Bolton, P. D. Gader, Hichem Frigui, Pete Torrione, "Random Set Framework for Multiple Instance Learning", J. of Information Sci., (181)11, 1, 2011, pp 2061-2070.
- O. Missaoui, H. Frigui, and P. D. Gader, "Landmine Detection with Ground Penetrating Radar using Multi-Stream Discrete Hidden Markov Models", IEEE Trans. Geoscience and Remote Sensing, Volume 49, Issue 6, June 2011, pp. 2080-2099
- Heo, P. D. Gader, "Robust Kernel Discriminant Analysis using Fuzzy Memberships", Pattern Recognition, Volume 44, Issue 3, March 2011, Pages 716-723.
- Zare and P. D. Gader, "PCE: Piece-wise Convex Endmember Detection" IEEE Trans. Geoscience and Remote Sensing, Vol. 48, No. 6, June 2010, pp. 2620-2632.
- Frigui, L. Zhang, P. D. Gader, "Context Dependent Multi-Sensor Fusion and its Application to Land Mine Detection", IEEE Trans. Geoscience and Remote Sensing, Vol. 48, No. 6, June 2010, pp. 2528 2543.
- Ramachandran, P. D. Gader, J. N. Wilson, "GRANMA: Gradient Angle Model Algorithm on Wideband EMI data for Landmine Detection", Geoscience and Remote Sensing Letters, Vol. 7, No. 3, July 2010, pp. 535-539.
- Bolton, P. D. Gader, "Random Set Framework for Context-Based Classification with Hyperspectral Imagery", IEEE Trans. Geoscience and Remote Sensing, Vol. 47, No. 11, Nov. 2009, Page(s): 3810-3821.
- McElroy and P. D. Gader, "Generalized Encoding and Decoding Operators for Lattice Based Associative Memories" IEEE Transactions on Neural Networks, Vol. 20, No. 10, October 2009, Page(s): 1674-1679.
- R. Mazhar, P. D. Gader, J. N. Wilson, "Matching Pursuits Dissimilarity Measure for Shape-Based Comparison and Classification of High-dimensional Data", IEEE Trans. Fuzzy Systems, Vol. 17, No. 5, Oct. 2009, Page(s): 1175-1189.
- Heo, P. D. Gader, and H. Frigui, "RKF-PCA: Robust kernel fuzzy PCA", Neural Networks, Vol. 22, No. 5-6, July 2009, Page(s): 642-650.
- Frigui and P. D. Gader, "Detection and discrimination of land mines in groundpenetrating radar based on edge histogram descriptors and a Possibilistic K-Nearest Neighbor Classifier", IEEE Trans. Fuzzy Systems, 17:9, 2009, pp. 185-199.
- Bolton, P. D. Gader, J. N. Wilson, "Discrete Choquet Integral as a Distance Metric", IEEE Trans. Fuzzy Systems (16)4, Aug. 2008 Page(s):1107 1110.
- Zare and P. D. Gader, "Hyperspectral Band Selection and Endmember Detection Using Sparsity Promoting Priors", IEEE Geosci. & Remote Sensing Letters, (5)2, 2008, pp. 256-261.
- Ho, L. Carin, P. D. Gader, J. N. Wilson, "An Investigation of Using the Spectral Characteristics from Ground Penetrating Radar for Landmine/Clutter Discrimination", IEEE Trans. Geoscience and Remote Sensing, Vol. 46, No. 4, April 2008, pp. 1177-1192.

## Name: ADELSALAM 'SUMI' HELAL

Education: Ph.D. in Computer Sciences, Purdue University, 1991

#### Academic experience:

- January 2005 present: Director of the Gator Tech Smart House, Gainesville, Florida.
- June 2004 present: Professor, CISE, University of Florida
- Oct 2001 2007: Director of Technology Development, NIDRR RERC Center on Successful Aging
- April 2000 present: Director of the Mobile & Pervasive Computing Laboratory, University of Florida
- June 2001 June 2004: Tenured Associate Professor, Computer & Information Science & Engineering, University of Florida.
- Aug 1998 June 2004: Associate Professor, Computer & Information Science & Engineering, University of Florida.
- Teaching: Assistant Professor at the University of Texas at Arlington, 1991 1994.
- Teaching: Visiting Assistant Professor at Purdue University, 1994-1995.

## Non-academic experience:

- Industrial: Senior member of the technical staff at Micro Electronics and Computer Corporation of America (MCC), 1995-1998.
- Consultant to several companies including Motorola, IBM Watson Research Center, Sarnoff Corporation, DoCoMo USA, among others.

## Certifications or professional registrations: none

**Current membership in professional organizations:** IEEE (senior member), ACM, USENIX, IEEE Computer Society

## Honors and awards:

- IEEE Certificate of Appreciation for recognition of achievements in the organization of several conferences and workshops.
- Sole author of the most downloaded single article from the IEEE Pervasive Computing Digital library for the month of April 2005.

## Service activities:

- Organized or organizing 22 conferences and workshops mainly sponsored by IEEE or the National Science Foundation.
- On Editorial Board of 10 major journal and magazines all in the area of mobile and pervasive computing

# Most important publications and presentations from the past five years:

• A. Helal and Y. Xu, "The Cloud, the Edge and Beneath," to appear in the proceedings of the 8th IEEE Wireless Communication and Mobile Computing Conference, Cyprus, August 2012.

- E. Kim and A. Helal, "Knowlwdge-Assisted Activity Modeling and Recognition," Accepted for papulication (February 2012) in the International Journal of E-Health and Medical Communications (IJEHMC), to appear 2013.
- D. Nguyen, N. Nguyen, M. Thai, and A. Helal, "Coverage Hole Healing in Hybrid Sensor Networks," Accepted for publication in the International Journal of Sensor Networks (IJSNet). To appear 2012.
- S. Cadavid, M. Abdel-Mottaleb and A. Helal, "Exploiting Visual Quasi-Periodicity for Real-time Chewing Event Detection using Active Appearance Models and Support Vector Machines," Accepted for publication June 2011. To appear 2012 in Personal and Ubiquitous Computing Journal, Springer Publishing.
- D. Jo, A. Helal, E. Kim W. Lee and C. Lee, "Adaptive Push/Pull Protocols for P2P Based Video Streaming," Accepted for publication July 2011. To appear 2012 in the IEICE Transactions on Communications.
- E. Cho and A. Helal, "Expressive Exceptions for Safe Pervasive Spaces," Accepted for publication (February 2012). To appear in the Journal of Information Processing Systems (JIPS) 2013.
- A. Helal, C. Chen, E. Kim and C. Lee "Towards an Ecosystem for Developing and Programming Assistive Environments," In revision, the Proceedings of the IEEE (submitted 2011, revised 2012).
- M. Thai, R. Bose, R. Tiwari, A. Helal, "Detection and Tracking of Phenomena Clouds," In revision, the ACM transactions on Sensor Networks.
- A. Helal, "IT Footprinting Groundwork for Future Smart Cities," Guest Editor Introduction to the Smart City Special Issue of IEEE Computer, June 2011.
- D. Lee and A. Helal, S. Anton, S. De Deugd, and A. Smith, "Participatory and Persuasive Tele-Health," The International Journal of Experimental, Clinical, Behavioral, Regenerative and Technological Gerontology. DOI: 10.1159/000329892. Karger AG, Bassel, Swistzerland.
- A. Helal, R. Bose, C. Chen, A. Smith, S. de Deugd and D. Cook, "STEPSTONE: A SODA Case Study in Personal Tele-Health Management," the Journal of Computing Science and Engineering (JCSE), KIISE. Accepted August 2011, to appear 2011.
- C. Chen, A. Helal, "System-wide Support for Safety in Pervasive Spaces," Journal of Ambient Intelligence and Humanized Computing (AIHC), ISSN 1868-5137, Springer Berlin / Heidelberg, pp1-11, December 2011.
- A. Helal, JW Lee, S. Hossain, EJ Kim, H. Hagras, D. Cook "Persim- Simulator for Human Activities in Pervasive Spaces," In Proceedings of the 7th International Conference on Intelligent Environments, Nottingham, UK, July 2011
- Y. Xu, A. Helal, M. Thai and M. Schmalz, "Optimizing Push/Pull Envelopes for Energy-Efficient Cloud-Sensor Systems," In Proceedings of the 14th ACM International Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems (MSWiM), Miami, Florida, December 2011.

## Name: AHMED HELMY

Education: Ph.D., University of Southern California, 1999

#### Academic experience:

- Associate Professor, CISE Department, University of Florida, 2006-present
- Assistant Professor, CISE Department, University of Florida, 1999-2006
- co-Founder and co-Director, Wireless and Sensor Networks Lab, USC , 2005-2006
- Founder/Director, Computer Networks Protocol Design & Testing Lab, USC 2000-2006
- Director, Mobile Networking Laboratory, Univ of Florida

## Non-academic experience: none

## **Certifications or professional registrations:** none **Current membership in professional organizations:** IEEE, ACM

## Honors and awards:

- National Science Foundation (NSF) CAREER Award, June 2002 May 2008
- National Science Foundation (NSF) NETS ANET Grant/Award, Oct 2008 Sept 2012
- National Science Foundation (NSF) NETS NOSS Grant/Award, Sept 2004 Sept 2008.
- NSF/NASA STRESS Grant/Award, October 2002 October 2007
- Nominated: Sloan Fellowship and USC Eng. Jr. Faculty Research Award 2003 2004.
- Best Paper Award, IEEE Int'l Conf on Mgmt of Multimedia Networks & Services, 2002
- Zumberge Award for Individual Research, USC, June 2000
- Award winner in ACM MobiCom WiNTECH demo competition (2nd place prize), 2010.
- Award winner in the ACM MobiCom SRC (3rd place) Sept 2007, and (4th place) 2008

## Service activities:

- Communications and Networks
- Area Editor of Networking for the IEEE Computer, starting Jan 2010.
- Area Editor for the Ad Hoc Networks Journal Elsevier, March 2007 March 2011.
- Member of the International Advisory Board for the IEEE/ACM IWCMC (International Wireless Communications and Mobile Computing Conference), since 2010. □
- Editor for the ACM Sigmobile Mobile Comm. and Computer Review (MC2R), 2009.
- Member of the Editorial Board for the Ad Hoc Networks Journal Elsevier, 2004-2007.
- Chair of the industrial advisory board (IAB) committee, CISE Dept, since Fall 2011.
- NSF panels and workshops (12 since 2001)
- Conference Chair or co-Chair:
  - ACM SIGMOBILE general workshop chair, ACM MobiCom, MobiHoc, MobiSys, and SenSys Conferences 2007, 2008, 2009, 2010, 2011.
  - ACM MobiSys Hop Planet Workshop: Co-Chair, June 2012.
  - ACM MSWiM (Int'l Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems): General Chair, Miami, FL, October 2011.
  - ACM MobiCom CHANTS (Workshop on Challenged Networks): Technical program co-Chair, Las Vegas, NV, September 2011. □
  - ICST/ACM AdhocNets (Int'l Conference on Ad Hoc Networks): Technical program

co-Chair, Paris, France, September 2011. □

- IEEE GlobeCom (Global Communications Conference): Chair and coordinator of keynote plenary panel on Sensor Networks, Miami, FL, December 2010.
- IEEE/ACM IWCMC (International Wireless Communications and Mobile Computing Conference): 2010.
- IEEE SECON (Comm. Society Conf. on Sensor, Mesh and Ad Hoc Networks

## Most important publications and presentations from the past five years:

- W. Hsu, D. Dutta, A. Helmy, "Mining Behavioral Groups based on Usage Data in Large Wireless LANs", IEEE Transactions on Mobile Computing (TMC). 2011, to appear.
- W. Hsu, D. Dutta, A. Helmy, "CSI: A Paradigm for Behavior-oriented Profile-cast Services in Mobile Networks", Ad Hoc Networks Journal Elsevier. 2010, to appear.
- S. Wang, A. Helmy, "BEWARE: Background Traffic-Aware Rate Adaptation for IEEE 802.11", IEEE/ACM Transactions on Networking (ToN), pp. 1164-1177, .
- S. Begum, A. Helmy, S. Gupta, "Modeling the Interactions Between MAC and Higher Layers: A Systematic Approach to Generate High Level Scenarios from MAC Level Scenarios", ACM TOMACS, Issue 1, Vol. 21, No. 7 (27 pages), pp. 7:1-7:27, 2010.
- W. Hsu, A. Helmy, "On Nodal Encounter Patterns in Wireless LAN Traces", IEEE Trans on Mobile Computing (TMC), Vol. 9, No. 11, pp. 1563-1577, November 2010.
- Y. Kim, A. Helmy, "CATCH: A Protocol Framework for Cross-layer Attacker Traceback in Mobile Multi-Hop Networks", Ad Hoc Networks J, Vol. 8, Issue 2, pp. 193-213, 2010.
- W. Hsu, T. Spyropoulos, K. Psounis, A. Helmy, TVC: "Modeling Spatial and Temporal Dependencies of User Mobility in Wireless Mobile Networks", IEEE/ACM Transactions on Networking (ToN), Vol. 17, No. 5, pp. 1564-1577, October 2009.
- S. Tanachaiwiwat, A. Helmy, "Encounter-based Worms: Analysis and Defense", Ad Hoc Networks Journal Elsevier, Volume 7, Issue 7, pp. 1414-1430, September 2009.
- M. Zuniga, K. Seada, B. Krishnamachari, A. Helmy, "Efficient Geographic Routing over Lossy Links in Wireless Sensor Networks", ACM Transactions on Sensor Networks (TOSN), Vol. 4, No. 3, Article 12 (33 pages), pp. 12:1-12:33, May 2008.
- K. Nahm, A. Helmy, C.-C. Kuo, "Cross-layer Interaction of TCP and Ad Hoc Routing Protocols in Multihop 802.11 Networks", IEEE Transactions on Mobile Computing (TMC), Vol. 7, Issue 4, pp. 458 469, April 2008.
- W. Hsu, F. Bai, A. Helmy, "Mobility Modeling for Vehicular Networks", Book chapter Chapman & Hall/CRC, (Ed. A. Boukerche). 2011.
- Y. Kim, A. Helmy, "Attacker Trace-back in Wireless and Mobile Networks", Book Chapter (Chapter 5), Handbook on Security and Networks, Eds. Y. Xiao, F. Li, H. Chen, by World Scientific Publishing Co., ISBN: 978-981-4273-03-9, March 2011.
- S. Tanachaiwiwat, A. Helmy, "Worm Propagation and Interaction in Mobile Networks", Book Chapter (Chapter 6), Handbook on Security and Networks, Eds. Y. Xiao, F. Li, H. Chen, by World Scientific Publishing Co., ISBN: 978-981-4273-03-9, March 2011.
- W. Hsu, A. Helmy, "Trace-based Analysis of Mobile User Behaviors for Opportunistic Networks", Book Chapter in the book "Mobile Opportunistic Networks: Architectures, Protocols and Applications", CRC Press, ISBN: 978-1-4200-6012-6, February 2011.

## Name: JEFFREY HO

Education: Ph.D., 1999 Mathematics, University of Illinois at Urbana-Champaign

#### Academic experience:

• Assistant Professor CISE, University of Florida, 2004-Present.

#### Non-academic experience:

• Research Associate Honda Research Institute, 2002-2003.

#### Certifications or professional registrations: none

## **Current membership in professional organizations:** IEEE, ACM.

#### Honors and awards:

- National Science Foundation Post-Doctoral Research Associate, 2000-2002.
- U.S. Department of Education Graduate Fellowship 1993-1997.

#### Service activities:

• Reviewers for major international academic and research journals and conferences.

## Most important publications and presentations from the past five years:

- Ranganathan, J. Ho and M.-H. Yang. "Online Sparse Gaussian Process Regression and Its Applications", To Appear in IEEE Transactions on Image Processing (TIP), 2010.
- M. Ali, J. Ho and M.-H. Yang. "On A\_ne Registration of Point Sets in R2 and R3", To Appear in Image and Vision Computing (IVC), 2010. Fourteen pages.
- N. Shahed, J. Ho and M.-H. Yang. "Online Visual Tracking with Histograms and Articulating Blocks", Computer Vision and Image Understanding (CVIU), 114 (8), pp. 901-914, 2010.
- J. Ho and M.-H. Yang. "A\_ne and Rigid Registrations of 2D Point Sets using Complex Numbers", Computer Vision and Image Understanding (CVIU), 114 (7), pp. 801-814, 2010.
- N. Lord, J. Ho, B. Vemuri and S. Eisenschenk. "Simultaneous registration and parcellation of bilateral hippocampal surface pairs for local asymmetry quanti\_cation", Transaction in Medical Imaging (TMI), 26 (4), pp. 471-478, 2007.
- S. Romdhani, J. Ho, D. Kriegman and T. Vetter. "Face Recognition Using 3-D Models: Pose and Illumination", Proceedings of IEEE, (94)11: 1977-1999, 2006.
- K.-C. Lee, J. Ho, and D. Kriegman. "Acquiring Linear Subspaces for Face Recognition under Variable Lighting", Pattern Analysis and Machine Intelligence (PAMI), 27(5): 684-698, May, 2005.
- K.-C. Lee, J. Ho, M.-H. Yang and D. Kriegman. "Visual Tracking and Recognition Using Probabilistic Appearance Manifolds", Computer Vision and Image Understanding

# Name: TAMER KAHVECI

Education: Ph.D., University of California, Santa Barbara, 2004

#### Academic experience:

- Associate Professor, CISE Department, University of Florida, 2010-present
- Assistant Professor, CISE Department, University of Florida, 2004-2010

#### Non-academic experience: none

**Certifications or professional registrations:** none **Current membership in professional organizations:** ACM, IEEE, ICSB

## Honors and awards:

- NSF CAREER Award, 2009-2014
- Honorary best paper award, ACM Intl Conf On Bioinformatics & Comput. Biology, 2011
- Best student paper award, ACM Intl Conf On Bioinformatics & Comput. Biology, 2010
- University of Florida, Research Initiative Award, 2008
- Best paper award at the Intl Conf on Computational Systems Biology, 2008
- ORAU Powe Junior Faculty Enhancement Award, 2006
- Silver medal at International Mathematics Olympiads, 1993

## Service activities:

- Editorial review board, Intl J. of Knowledge Discovery in Bioinformatics.
- Editorial Board, ISRN Bioinformatics.
- Editorial Board, Frontiers in Cancer Genetics.
- Editorial Board, Frontiers in Genomic Assay Technology
- Editorial Board, Network Modeling & Analysis in Health Informatics and Bioinformatics
- Program Comm. Chair, Intl Conf On Bioinformatics & Comput. Biology, 2012

- Michael Dang, Ferhat Ay, Tamer Kahveci, A Novel Framework for Large Scale Metabolic Network Alignments by Compression, International Conference On Bioinformatics and Computational Biology (ACM-BCB), 2011. (Honorary best paper)
- B Song, S Ranka, T Kahveci, Enzymatic target identification with dynamic states, Int Conf On Bioinformatics and Comput Biology, 2010. (**Best student paper award**)
- Ferhat Ay, Tamer Kahveci, Valerie de Crecy-Lagard, Consistent alignment of metabolic pathways without any abstraction in modeling, International Conference on Computational Systems Biology (CSB), 2008. (Best paper award)
- Gunhan Gulsoy, Bhavik Gandhi, Tamer Kahveci, TOPAC: Alignment of gene regulatory networks using topology aware coloring, Journal of Bioinformatics and Computational Biology (JBCB) to appear
- Daniel Marbach, Sushmita Roy, Ferhat Ay, Patrick E. Meyer, Rogerio Candeias, Tamer Kahveci, Christopher A. Bristow, and Manolis Kellis, Predictive regulatory models in Drosophila melanogaster by integrative inference of transcriptional networks, Genome Research, to appear.

- Nirmalya Bandyopadhyay, Manas Somaiya, Sanjay Ranka, Tamer Kahveci, CMRF : Analyzing Differential Gene Regulation in Two Group Perturbation Experiments, BMC Genomics, accepted for publication.
- Michael Dang, Ferhat Ay, Tamer Kahveci, Metabolic network alignment in large scale by network compression, BMC Bioinformatics vol 13, 2012.
- Gunhan Gulsoy, Tamer Kahveci, RINQ: Reference-based Indexing for Network Queries, Bioinformatics, 27 (13): i149-i158. (International Conference on Intelligent Systems for Molecular Biology (ISMB), 2011)
- Basma El Yacoubi, Isabelle Hatin, Christopher Deutsch, Tamer Kahveci, Jean-Pierre Rousset, Dirk Iwata-Reuyl, Alexey G Murzin and Valerie de Crecy-Lagard, A role for the universal Kae1/Qri7/YgjD (COG0533) family in tRNA modification, The EMBO Journal advance online publication 1 February 2011; doi:10.1038/emboj.2010.363.
- Ferhat Ay, Manolis Kellis, Tamer Kahveci, SubMAP: Aligning metabolic pathways with subnetwork mappings, Journal of Computational Biology, 18(3):1-17, 2011.
- Bin Song, I. Esra Buyuktahtakin, Sanjay Ranka, Tamer Kahveci, Manipulating the steady state of metabolic pathways, IEEE/ACM Transactions on Computational Biology and Bioinformatics (IEEE TCBB), 8(3), pages 732-747, 2011.
- Jayendra Venkateswaran, Bin Song, Tamer Kahveci, Christopher Jermaine, TRIAL: A Tool for Finding Distant Structural Similaritie, IEEE/ACM Transactions on Computational Biology and Bioinformatics (IEEE TCBB), 8(3), pages 819-831, 2011.
- Nirmalya Bandyopadhyay, Sanjay Ranka, Y. Sun, Steve Goodison, Tamer Kahveci, Pathway based Feature Selection for Cancer Microarray Data, Journal of Advances in Bioinformatics, accepted for publication.
- Nirmalya Bandyopadhyay, Tamer Kahveci, GBA Manager : An online tool for querying low complexity regions in proteins, Journal of Computational Biology, 17(1):73-7, 2010.
- Ferhat Ay, Fei Xu, Tamer Kahveci, Scalable Steady State Analysis of Boolean Biological Regulatory Networks, PLoS ONE 4(12), pages e7992, 2009.
- Jun Liu, N Bandyopadhyay, Sanjay Ranka, Michael Baudis, Tamer Kahveci, Inferring Progression Models for CGH data, Bioinformatics, 25:15, pages 2208-2215, 2009.
- Ferhat Ay, Tamer Kahveci, Valerie de Crecy-Lagard, A Fast And Accurate Algorithm For Comparative Analysis Of Metabolic Pathways, Journal of Bioinformatics and Computational Biology (JBCB), 7:3, pages 389-428, 2009.
- Bin Song, Padmavati Sridhar, Tamer Kahveci and Sanjay Ranka, Double Iterative Optimization for Metabolic Network-Based Drug Target Identification, International Journal of Data Mining and Bioinformatics, 3:2, pages 145-159, 2009.
- Jun Liu, Sanjay Ranka, Tamer Kahveci, Classification and Feature Selection Algorithms for Multi-class CGH data, Bioinformatics, 24 (13): i86-i95. (International Conference on Intelligent Systems for Molecular Biology (ISMB), 86-95, 2008)
- Xuehui Li, Tamer Kahveci, and A. Mark Settles, A Novel Genome-Scale Repeat Finder Geared towards Transposons, Bioinformatics, 24(4): 468-476, 2008.
- Jayendra Venkateswaran, Deepak Lachwani, Tamer Kahveci, Christopher Jermaine, Reference-Based Indexing for Metric Spaces with Costly Distance Measures, the VLDB Journal, 17:5, pages 1231 - 1251, 2008.

## Name: JONATHAN C. L. LIU

Education: Ph.D., Computer Science and Engineering, University of Minnesota, 1996

## Academic experience:

- Assoc. Professor, CISE Department, Univ of Florida, 2002 to date
- Asst. Professor, CISE Department, Univ of Florida, 1999 to 2002
- Asst. Professor, Computer Science, School of EECS, Washington State Univ, 1996-1999

## Non-academic experience:

- Consultant for Hyperbole, Seattle, Washington, 1998-1999.
- Consultant for Packet Engines, Spokane, Washington, 1997-1999.
- Consultant for Honeywell Technology Center, Minnesota, 1993-1996.
- Consultant for IVI Publishing, Minnesota, 1993-1996.

## Certifications or professional registrations: none

## Current membership in professional organizations: IEEE, ACM

## Honors and awards:

- National Science Foundation CAREER Award, 1999-2005.
- Who's Who in Sciences Higher Education (WWSHE), AcademicKeys, 2004.
- Keynote address at The NDSU Workshop on ATM Networking, North Dakota, 1996.
- Research Contribution Awards, University of Minnesota, 1995, 1996.
- MMRRI Research Fellowship, University of Alabama, 1990-1991.

## Service activities:

• Area Editor, Networks and Multimedia, IEEE COMPUTER, 2001-2007ZZ

- Weng, S. Wang, J. Liu and D. Goyal, "Prediction-based Reversible Data Hiding Using Empirical Histograms in Images", to appear in KSII Trans. Internet and Information Systems.
- S. Chung, E. Jung, E. Kim and J. Liu, "An MST-based Network Architecture for Sharing Broadcast TV Programs" Consumer Communications and Networking Series, IEEE Communications Magazine, Vol. 48, No. 06, pp. 82--91, June 2010.
- M. Yang, J. Liu and Y. Tseng, "Security, Privacy, and Identification Technologies in Wireless
- Sensor Networks", International Journal of Security and Networks, Vol. 5, No. 1, pp. 1-2, 2010.
- J. Wang, J. Liu, and M. Masilela, ``A Real-Time Video Watermarking System with Buffer Sharing for Video-on-demand Service", International Journal of Computers and Electrical Engineering, on-line version Volume 35, Issue 2, Pages: 395-414, 2009.
- S. Chung, E. Kim and J. Liu, ``A Storage Saving Schemes to Share HD-Quality Content in Community Networks" IEEE Transactions on Consumer Electronics Vol. 54, No. 4,

pp. 1730-1738, Nov. 2008.

- S. Chung, E. Kim and J. Liu, "A Scalable PVR-based Content Sharing Architecture for Community Networks", IEEE Trans on Consumer Electronics Vol. 54, No. 3, pp. 1192-1199, Aug. 2008.
- J. Wang, M. Masilela, J. Liu, "Transmission Buffer Management and Node Failure Recovery in
- Wireless Sensor Networks", Mediterranean Journal of Computers and Networks, Vol 4, No. 2, April 2008, pp.44-53.
- Lee, J. Liu, K. Chen, Y. Tseng, and S.P. Kuo, ``System Study of the Wireless Multimedia Ad hoc Network based on IEEE 802.11g", International Journal of Security and Its Applications, Vol. 2, No. 2, pp. 23-40, April 2008.
- J. Wang and J. Liu,, "Uplink Relaying in Hybrid Wireless Networks with Interference Reduction", ACM Journal of Wireless Networks, 29 February, 2008.
- J. Wang and J. Liu, ``Network Clustering and Interference Reduction in CDMA networks Using Mobile Relaying" International Journal of Computer and Information Science (IJCIS), Vol. 7, No. 1-4, 2007
- J. Wang and J. Liu, ``Optimizing Uplink Scheduling in An Integrated 3G/WLAN Network", Intl J of Wireless and Mobile Computing, Vol. 2, No. 4, pp. 288--302, 2007.
- J. Wang and J. Liu, ``Uplink Scheduling in Clustered 3G Network with Mobile Relaying", Intl Journal of Parallel, Emergent, and Distributed Systems, Vol. 21, No. 06, 2006.
- Kim and J. Liu, ``Time-Aware Prefetching for On-Demand Video Service in a Residential Gateway", International Journal of Multimedia Tools and Applications, Special Issue on Advances in Consumer Communications and Networking 29: 233--255, Jul., 2006.
- Kim and J. Liu, ``Design of HD-Quality Streaming Networks for Real-time Content Distribution", IEEE Transactions on Consumer Electronics 52(2): 392--401, May 2006.

- ``A Trustworthy Computing of ADAPT Principle Guaranteeing Genuine Medical Image", IEEE Intl Conf on Parallel & Distributed Systems, Dec 2011, Tainan, Taiwan.
- ``A Secret Embedding Scheme by Means of Re-indexing VQ Codebook upon Image Processing", International Conference on Data Engineering and Internet Technology, Mar. 15-17, 2011, Bali, Indonesia.
- V. Kulkarni and J. Liu, ``Software-Only M-JPEG Performance for Multimedia Applications", Intl Conf on Distributed Multimedia Systems, 2010, Oak Brook, IL
- ``An Efficient MST-Based Content-Sharing Architecture for P2P/PVR Networks", IEEE Intl Symp. on Multimedia, Dec 2009, San Diego, California, USA.
- ``An Efficient Storage Utilization for High-Quality Content Distribution in a PVR-based Community", IEEE Globecom 2009, Symp. on Selected Areas in Communications. Nov 2004, Honolulu, Hawaii, USA.
- ``A Scalable HD-Quality Content-Sharing Network Supporting WiMax Broadband Wireless Access", IEEE Consumer Commm. & Networking Conf 2009, Las Vegas, NV
- ``Video Authentication Against Correlation Analysis Attack in Wireless Networks", IEEE Intl Symp on Multimedia (ISM2008) Dec 2008, Berkeley, California, USA

## Name: BENJAMIN LOK

Education: Ph.D., Computer Science, University of North Carolina at Chapel Hill, 2002

#### Academic experience:

- University of Florida, Associate Professor, 2009-2011, full-time
- University of Florida, Assistant Professor, 2003-2009, full-time

#### Non-academic experience: none

## Certifications or professional registrations: none

## Current membership in professional organizations: IEEE, ACM

## Honors and awards:

- Speaker at the National Academy of Science Kavli France-US Frontiers of Science Symposium in Roscoff, France (2008)
- IEEE Virtual Reality 2008 Best Paper
- NSF Career Award (2007)
- University of Florida Student ACM Chapter's CISE Teacher of the Year (2005)
- ACM SIGGRAPH Symposium on Interactive 3D Graphics 2003 Top 3 Paper (2003)

## Service activities:

- Department of Computer and Information Sciences and Engineering Graduate Affairs Committee
- Department of Computer and Information Sciences and Engineering Curriculum Committee
- College of Engineering Technology Innovation Advisory Committee
- College of Engineering Faculty Innovation Council
- College of Engineering IT Steering Committee
- Steering Committee: IEEE Virtual Reality Conference (2009-present)
- General Chair: IEEE Virtual Reality 2013
- Program Chair: IEEE Virtual Reality 2011, IEEE Virtual Reality 2010, ACM VRST 2009, IEEE/ACM ISMAR 2009 (Area Co-Chair)

- Wendling, A., Halan, S., Tighe, P., Le, L., Euliano, T., and Lok, B. "Virtual humans versus standardized patients in presenting abnormal physical findings", Academic Medicine. In press
- Kotranza, A.\*, Cendan, J., Johnsen, K., and B. Lok. "Simulation of a Virtual Patient with Cranial Nerve Injury Augments Physician-Learner Concern for Patient Safety," Journal on Bio-Algorithms and Med-Systems, Vol. 6, No. 11, 2010, 25-34.
- Quarles, J.\*, Lampotang, S., Fischler, I., Fishwick, P., and B. Lok, "A Mixed Reality Approach for Interactively Blending Dynamic Models with Corresponding Physical

Phenomena" " (in press) ACM Transactions on Modeling and Computer Simulation, Volume 20, Issue 4, October 2010.

- Quarles, J.\*, Lampotang, S., Fischler, I., Fishwick, P., and B. Lok, "Scaffolded Learning with Mixed Reality" (accepted) Computers and Graphics: Special Issue on Virtual Reality, , Volume 33, Issue 1, Feburary 2009, 34-46.
- Kotranza, A.\*, Lok, B., Deladisma, A., Pugh, C.M., and D. S. Lind, "Mixed Reality Humans: Evaluating Behavior, Usability, and Acceptability," (accepted) IEEE Transactions on Visualization and Computer Graphics. July/August 2009.
- DiPietro, J., Maddox, W., Rivera-Gutierrez, D., and Lok, B. "Investigating perceptions of avatars in an interactive digital simulation," Annual Meeting of the American Educational Research Association. New Orleans, LA. (AR: 38%).
- S Halan, B Rossen, J Cendan, B Lok, "High Score! Motivation Strategies for User Participation in Virtual Human Development", 10th International Conference on Intelligent Virtual Agents (IVA 2010), Philadelphia, Pennsylvania, Sept. 20-22, 2010 -LNCS Proceedings, 482-488.
- B Rossen, J Cendan, B Lok, "Using Virtual Humans to Bootstrap the Creation of Other Virtual Humans", 10th International Conference on Intelligent Virtual Agents (IVA 2010), Philadelphia, Pennsylvania, Sept. 20-22, 2010 LNCS Proceedings, 392-398.
- Johnsen, K., Beck, D., and Lok, B. "The Impact of a Mixed Reality Display Configuration on User Behavior with a Virtual Human.", 10th International Conference on Intelligent Virtual Agents (IVA 2010), Philadelphia, Pennsylvania, Sept. 20-22, 2010 -LNCS Proceedings, 42-48.

## Name: PRABHAT MISHRA

Education: Ph.D. Information and Computer Sc. University of California, Irvine, 2004

#### Academic experience:

- Since Aug 16, 2010: Associate Professor, CISE Department, University of Florida
- Jul 2004 Aug 2010 Assistant Professor, CISE Department, University of Florida
- May Dec 2006: Assistant Professor, Indian Institute of Science, Bangalore
- Apr Jul 2004: Asst. Project Scientist, CECS, University of California, Irvine
- Jul 2000 Mar 2004: Research Assistant, University of California, Irvine

#### Non-academic experience:

- Summer 2001, 2002: Research Intern, PowerPC Design Center, Motorola, Austin
- Summer 2000: Research Intern, IA-64 Perf. Group, Intel, Santa Clara

## Certifications or professional registrations: none

#### Current membership in professional organizations: ACM, IEEE

#### Honors and awards:

- NSF CAREER Award, National Science Foundation, 2008-2013
- VLSI Design Best Paper Award, International Conference on VLSI Design, 2011
- International Educator of the Year, College of Engineering, Univ. of Florida, 2007
- Outstanding Dissertation Award, European Design Automation Association, 2004
- CODES+ISSS Best Paper Awardm ACM/IEEE CODES+ISSS Conference, 2003

## Service activities:

- Member, Shared Infrastructure Advisory Committee, UF Info. Technology, 2011–12.
- Steering Committee Member, Interdisciplinary Strategic Planning (Energy), 2009 2010
- Member, Graduate Admissions Committee, 2005-2011.
- Member, Scholarships and Awards Committee, 2005-2011.
- Member, Colloquium Committee, 2005-2011.
- Commencement Representative, 2004-2006.

- P. Mishra and N. Dutt, Editors, "*Processor Description Languages: Applications and Methodologies*", ISBN 978-0-12-3742872, Morgan Kaufmann, June 2008.
- W. Wang, S. Ranka and P. Mishra, *Energy-Aware Dynamic Reconfiguration Algorithms for Real-Time Multitasking Systems*, Elsevier Sustainable Computing: Informatics and Systems(SUSCOM), 2010.
- M. Chen, P. Mishra and D. Kalita, *Efficient Test Case Generation for Validation of UML Activity Diagrams*, Accepted to appear in Springer Design Automation for Embedded Systems (DAES), 2010.

- M. Chen and P. Mishra, *Efficient Techniques for Directed Test Generation using Incremental Satisfiability*, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), 2009.
- X. Qin, C. Murthy and P. Mishra, Decoding-aware Compression of FPGA Bitstreams, IEEE Transactions on Very Large Scale Integration (VLSI) Systems (TVLSI), 2009.
- K. Basu and P. Mishra, "*Test-Data Compression using Application-Aware Bitmask and Dictionary Selection Methods*", IEEE Transactions on Very Large Scale Integration Systems (TVLSI), volume 18, issue 9, pages 1277-1286, 2010. DOI: 10.1109/TVLSI.2009.2024116.
- X. Qin and P. Mishra, *A Universal Placement Technique of Compressed Instructions for Efficient Parallel Decompression*, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), volume 28, no 8, pages 1224-1236, August 2009.
- H. Koo and P. Mishra, Functional Test Generation using Design and Property Decomposition Techniques, ACM Transactions on Embedded Computing Systems (TECS), vol 8, no 4, article 32, July 2009.
- S. Seong and P. Mishra, *Bitmask-Based Code Compression for Embedded Systems*, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), 27(4), pages 673-685, 2008.

## Name: RICHARD NEWMAN

Education: Ph. D. Computer Science, 1987. University of Rochester, Rochester, NY

#### Academic experience:

• University of Florida, CISE, Assistant Professor, 1986-present, full time

#### Non-academic experience:

- Intellon Corp./Atheros/QualComm, contractor, consult in powerline network protocols and security, 1999-present, part time
- Epic Tide/Fair Warning, board of directors, oversee and advise security company, 2004present, part time
- Unistry Associates, senior scientist, consult in intrusion and anomaly detection, 1995-1999, part time

#### Certifications or professional registrations: none

#### Current membership in professional organizations: ACM, IEEE

#### Honors and awards:

- University Superior Accomplishment Award for Faculty Service, University of Florida, 1995-1996
- ACM Teacher of the Year, CISE Department, 1994-1995
- Distinguished Service Key, Alpha Phi Omega National Service Fraternity, 1991

#### Service activities:

- Reviewer, several conferences and journals
- Various departmental committees (comprehensive exams, facilities, petitions, etc.)
- Editorial board, International Journal of Network Management
- Co-chair, IEEE ISPLC 2006

- Piyush Harsh and Richard E. Newman, "Using Geo-Spatial Session Tagging for SmartMulticast Session Discovery," ACM SIGAPP SAC 2009, Honalulu, Mar. 2009.
- Richard Newman and Ira S. Moskowitz, "Practical Covert Channel Implementation through a Timed Mix-Firewall," IEEE NSP'08, Austin, Dec. 2008.
- Piyush Harsh and Richard E. Newman, "Usability and Acceptance of an Image-based Authentication System," IEEE International Carnahan Conference on Security Technology, October 8-11, 2007, Ottawa, ON.
- Richard E. Newman, Larry Yonge, Sherman Gavette, and Ross Anderson, "HomePlug AV Security Mechanisms," IEEE ISPLC 2007, Pisa, Italy, March 26-28, 2007.
- Srinivas Katar, Brent Mashburn, Richard Newman, and Haniph Latchman, "Allocation Requirements for Supporting Latency-Bound Traffic in HomePlug AV Networks," IEEE GlobeCom, San Francisco, 27 Nov. 1 Dec. 2006.

- Srinivas Katar, Brent Mashburn, Kaywan Afkhamie, Haniph Latchman, and Richard Newman, "Channel Adaptation Based on Cyclo-stationary Noise Characteristics in PLC Systems," IEEE International Symposium on Power Line Communications (ISPLC 2006), Orlando, FL, March 26-29, 2006, pp. 16-21
- Srinivas Katar, Manjunath Krishnam, Brent Mashburn, Kaywan Afkhamie, Richard Newman, and Haniph Latchman, "Beacon Schedule Persistence to Mitigate Beacon Loss in HomePlug AV Networks,"," IEEE International Symposium on Power Line Communications (ISPLC 2006), Orlando, FL, March 26-29, 2006, pp. 184-188

## Name: JIH-KWON PEIR

Education: Ph.D. (Computer Science), University of Illinois at Urbana-Champaign, 1986.

## Academic experience:

- Associate Professor, Computer & Information Sciences Department, University of Florida, Gainesville, Florida, Jan. 1994 Present
- Visiting Professor, Tsing-Hua University, Taiwan, 1992 1993.

## Non-academic experience:

- Visiting Researcher, Intel Microprocessor Research Lab, Summer 1999/2001/2002/2003 and year 2000.
- Visiting Researcher, IBM Almaden Research Center, summer 1995.
- Division Director, Computer and Communication Lab, Industry Technology Research Institute, Taiwan, 1992 1993.
- Research Staff Member, Computer Science Department, IBM Thomas J. Watson Research Center, Yorktown Heights, New York, 1986 1992.

## Certifications or professional registrations: none

## Current membership in professional organizations:

## Honors and awards:

- Outstanding Alumni Award, College of Engineering, University of Wisconsin Milwaukee, 2010.
- Two BEST Paper Awards, ICCD Conference, 2001, 1990.
- NSF CAREER Award, 1996.
- IBM Research Partinership Award, 1995.
- IBM Invention Achievement Award, 1992.
- IBM First Patent Award, 1991.

## Service activities:

- Program Area Co-Chair: Architecture and Systems, 2009 International Symposium on Pervasive Systems, Algorithms, and Networks (I-SPAN), 2009.
- Graduate Program Coordinator, Department of Computer Information Science and Engineering, University of Florida, 2001 present.
- Subject Area Editor, Journal of Parallel and Distributed Computing, 1991 present.
- Associate Editor, IEEE Transactions on Parallel and Distributed Systems, 1998 2004.
- Keynote Speaker, 8th Workshop on Compiler Techniques for High–Performance Computing (CTHPC2002), 2002.
- NSF Core Program Panelist, 2002 2008.
- NSF CAREER Panelist, 2000.
- Various Conference Program Committee Members, 1990 2009.
- Various Conference Section Chairs, 1993 2009.

## Most important publications and presentations from the past five years:

- Z. Huang, J-K. Peir, S. Chen, "Approximately-Perfect Hashing: Improving Network Throughput through Efficient Off-chip Routing Table Lookup", 30th IEEE Int'l Conf. on Computer Communications, (INFOCOM'11), May 2011.
- Z. Huang, D. Lin, S. Chen, J-K. Peir, S. IftekharulAlam, "Fast Routing Table Lookup Based on Deterministic Multi-hashing," 18th IEEE Int'l Conf. on Network Protocols (ICNP'10), Oct. 2010.
- Liu, Z. Huang, J-K. Peir, X. Shi, and L. Peng, "Accurate and Timely Streaming Prefetcher," in Journal of Instruction-Level Parallelism, Oct. 2010.
- J. Chen, Z. Zuang, J.-K Peir, J. Chen, Z, Huang, F. Su, J-K. Peir, J. Ho, "Weak Execution Ordering Exploiting Iterative Methods on Many-Core GPUs," IEEE Int'l Symp. on Performance Analysis of Systems and Software (ISPASS'10), March 2010.
- X. Shi, F. Su, J-K. Peir, Y. Xia, Z. Yang," Modeling and Stack Simulation of CMP Caches Capacity and Accessibility," IEEE Trans. on Parallel and Distributed Systems, Dec. 2009.
- M.K. Yoon, T. Li, S. Chen, J-K. Peir, "Fitting a Spread Estimator in a Small Memory," The 28th Conference on Computer Communications, (INFOCOM'09), April 2009.
- L. Peng, J-K. Peir, T. K. Prakash, C. Staelin, Y-K. Chen, D. Koppelman, "Memory Hierarchy Performance Measurement of Commercial Dual-Core Desktop Processors," Journal of Systems Architecture, Elsevier, Vol.54 (8), Aug. 2008.
- Z. Huang, X. Shi, Y. Xia, J-K. Peir, "Alternative Home: Balancing Distributed CMP Coherence Directory," 2nd Workshop on Chip Multiprocessor Memory System and Interconnects, (CMP-MSI'08), June, 2008.
- X. Shi,, F. Su, J-K. Peir, Y. Xia, Z. Yang, "Accessibility vs. Capacity: Modeling and Single-Pass Stack Simulation on CMP Caches", 2007 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS'07), April 2007.
- L. Peng, J-K. Peir, T.K. Prakash, Y-K. Chen and D. Koppelman, "Memory Performance and Scalability of Intel's and AMD's Dual-Core Processors: A Case Study", the 26th IEEE International Performance Computing and Communications Conference (IPCCC'07), April 2007.
- Z. Yang, X. Shi, F. Su and J-K. Peir, "Overlapping Dependent Loads with Addressless Preload," 15th Int'l Conf. on Parallel Architectures and Compilation Technology (PACT'06), Sep. 2006.

## Name: JORG PETERS

**Education:** 1990 PhD, advisor Carl de Boor, Univ. of Wisconsin, Madison, Computer Sciences

## Academic experience:

- 2004: Professor, CISE, University of Florida, Gainesville, FL
- 1998–2004: Assoc. Professor, CISE, tenured University of Florida, Gainesville, FL
- 1997–98: Assoc. Professor, CS, tenured, Purdue University, West Lafayette, IN
- 1992–97: Asst. Professor, CS, Purdue University, West Lafayette, IN
- 1991–92: Asst. Professor, Math. Sciences Rensselaer Polytechnic Inst, Troy, NY

## Non-academic experience: none

## Certifications or professional registrations: none

# Current membership in professional organizations: SIAM, ACM, IEEE

## Honors and awards:

• NSF National Young Investigator 1994

## Service activities:

- Associate Editor of Computer Aided Geometric Design
- Associate Editor of ACM Transactions on Graphics
- Associate Editor of APNUM (Applied Numerical Mathematics)
- Organizer Dagstuhl Seminar 2008, 2011
- Chair SIAM activity group on Geometric Design
- co-Chair SIAM GD/ACM SPM conference 2011
- Program Committee (2008/9): Mathematics of Surfaces, SIAM Geometric Design, Shape Modeling Itl, Solid and Physical Modeling.

# Most important publications and presentations from the past five years:

- J. Peters and U. Reif. Subdivision Surfaces. Geometry and Computing, Springer Verlag, 2008. Monograph on subdivision theory.
- J. Peters. Geometric continuity. Chapter 8 in Handbook of Computer Aided Geometric Design. Elsevier, 2002.
- Alex Vlachos, Jorg Peters, Chas Boyd, and Jason L. Mitchell. Curved PN triangles. In 2001, Symposium on Interactive 3D Graphics, Bi-Annual Conference Series, pages 159–166. ACM Press, 2001. M. Kim and J. Peters. Symmetric Box-splines on the A\* lattice. J. Approx. Theory in print.
- Myles and J. Peters. Bi-3 C 2 Polar Subdivision ACM Transactions on Graphics, Siggraph 2009, 28(3):, 2009. Generalizes subdivision of bi-3 splines to irregular configurations

## Name: ANAND RANGARAJAN

Education: Ph.D., Electrical Engineering, University of Southern California, 1991

## Academic experience:

- 1984 to 1986, Teaching Assistant and Discussion Leader, University of Southern California, Los Angeles, CA.
- 1984 to 1990, Graduate Research Assistant, University of Southern California, Los Angeles, CA.
- 1990 to 1992, Postdoctoral Associate, Departments of Computer Science and Diagnostic Radiology, Yale University, New Haven, CT.
- 1992 to 1996, Associate Research Scientist, Departments of Computer Science and Diagnostic Radiology, Yale University, New Haven, CT.
- 1996 to 2000, Assistant Professor, Departments of Diagnostic Radiology and Electrical Engineering, Yale University, New Haven, CT.
- 2000 to present, Associate Professor, Department of Computer and Information Science and Engineering, University of Florida, Gainesville, FL (tenured, 2002).

## Non-academic experience:

• ConCADnation, LLC, 1995-1998

# Certifications or professional registrations: none

# Current membership in professional organizations: IEEE

## Honors and awards:

• Best Scientific paper, 2008, International Conference on Pattern Recognition (ICPR).

# Service activities:

- Program committees IPMI, EMMCVPR
- Area chair ICCV 2007
- Associate Editor, IEEE T-PAMI 2004-2008
- Associate Editor CVIU 2007-2010.

- K.S. Gurumoorthy, A. Rangarajan and A. Banerjee, The Complex Wave Representation of Distance Transforms, Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR), Springer LNCS 6819, 413-427, 2011.
- K.S. Gurumoorthy, A. Rajwade, A. Banerjee and A. Rangarajan, A Method for Compact Image Representation using Sparse Matrix and Tensor Projections onto Exemplar Orthonormal Bases, IEEE Transactions on Image Processing, 19(2): 322-334, 2010.
- T. Chen, B.C. Vemuri, A. Rangarajan, and S.J. Eisenschenck, Group-wise point-set registration using a novel CDF-based Havrda-Charvát Divergence, International Journal of Computer Vision (IJCV), 86(1):111-124, 2010.
- Rangarajan and K.S. Gurumoorthy, A Schrödinger wave equation approach to the eikonal

equation: Application to image analysis, Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR), Springer LNCS 5681, 140-153, 2009.

- Rajwade, A. Banerjee and A. Rangarajan, Probability Density Estimation using Isocontours and Isosurfaces: Application to Information Theoretic Image Registration, IEEE Transactions on Pattern Analysis and Machine Intelligence, 31(3):475-491, 2009.
- Peter and A. Rangarajan, Information Geometry for Landmark Shape Analysis: Unifying Shape Representation and Deformation, IEEE Transactions on Pattern Analysis and Machine Intelligence, 31(2):337-350, 2009.
- Peter and A. Rangarajan, Maximum Likelihood Wavelet Density Estimation with Applications to Image and Shape Matching, IEEE Transactions on Image Processing, 17(4):458–468, 2008.
- Wang, B.C. Vemuri, A. Rangarajan, and S.J. Eisenschenck, Simultaneous Nonrigid Registration of Multiple Point-Sets and Atlas Construction, IEEE Transactions on Pattern Analysis and Machine Intelligence, 30(11):2011-2022, 2008.

## Most recent professional development activities:

- NSF proposal, Complex data visualization using interactive multiscale machine learning (funded).
- NSF proposal, Complex wave formulations for shape analysis (funded).
- DARPA proposal, Quantum information geometry for integrated sensor representation and analytics (not funded).
- See also service activities above

## Name: SANJAY RANKA

Education: 1988m Ph.D, Computer and Information Science, University of Minnesota, MN

## Academic experience:

- 2002-- Professor, CISE, University of Florida, Gainesville, FL
- 1995-99 Associate Professor, CISE, University of Florida, Gainesville, FL
- 1993-95 Associate Professor, Computer Science, Syracuse University, Syracuse, NY
- 1988-93 Assistant Professor, Computer Science, Syracuse University, Syracuse, NY

## Non-academic experience:

• 1999-2002 Chief Scientist and CTO, Paramark Inc., Sunnyvale, CA

## Certifications or professional registrations: none

## Current membership in professional organizations: ACM, IEEE, AAAS

## Honors and awards:

- AAAS Fellow for "distinguished contributions to theory and practice of parallel and distributed computing", 2006.
- IEEE Fellow for "contributions to theory and practice of high performance computing", 2002.

## Service activities:

- Advisory board member, IEEE Technical Committee on Parallel Processing, 1998-2003.
- Member, IFIP Committee on System Modeling and Optimization, 1999-present.
- Associate Editor-in-Chief for Algorithms, Journal of Parallel and Distributed Computing (Algorithms and Scientific Computing).
- Subject Area Editor, Journal of Parallel and Distributed Computing (Algorithms and Scientific Computing), 1993-2010.
- Associate Editor, IEEE Transactions on Parallel and Distributed Computing, 2010present.
- Associate Editor, Sustainable Computing: Systems and Informatics, 2010-present.
- Associate Editor, Knowledge and Information Systems, 2010-present.
- Associate Editor, International Journal of computing, 2010-present.
- Co-General Chair, International Conference on Green Computing, 2011
- Co-General Chair, International Conference on Green Computing, 2010
- Co-General Chair, International Conference on Data Mining, 2009
- Program Chair, International Conference on Contemporary Computing, 2009
- Program Chair, International Conference on Contemporary Computing, 2010
- Track Chair, ACM Conference on Information and Knowlege Management 2010

## Most important publications and presentations from the past five years:

• Weixun Wang, Sanjay Ranka and Prabhat Mishra, Energy-Aware Dynamic Reconfiguration Algorithms for Real-Time Multitasking Systems, Accepted to appear in

Elsevier Sustainable Computing: Informatics and Systems (SUSCOM), 2010. (Invited Paper)

- Yan Li, Sanjay Ranka, Sartaj Sahni, In-Advance Path Reservation For File Transfers In e-Science Applications, Journal of Supercomputing, to appear.
- Nirmalya Bandyopadhyay, Tamer Kahveci, Sanjay Ranka, Yijun Sun and Steve Goodison, Pathway based Feature Selection Algorithm for Cancer Microarray Data" Advances in Bioinformatics, to appear.
- Bin Song, Esra Buyuktahtakin, Tamer Kahveci and Sanjay Ranka, Manipulating the steady state of metabolic pathways, IEEE/ACM Transactions on Computational Biology and Bioinformatics, to appear.
- Jaeyeon Kang and Sanjay Ranka, Slack allocation algorithms for parallel machines. Journal of Parallel and Distributed Computing, Vol. 70(1), pp. 23-24, 2010.
- Parbati K. Manna, Shigang Chen, Sanjay Ranka: Inside the Permutation-Scanning Worms: Propagation Modeling and Analysis. IEEE/ACM Transaction Networks 18(3): 858-870 (2010).
- Eun-Sung Jung, Sanjay Ranka, Sartaj Sahni: Topology Aggregation for e-Science Networks. International Journal of Next-General Computing, volume 1, 2010.
- Bin Song, Padmavati Sridhar, Tamer Kahveci and Sanjay Ranka, Double Iterative Optimization for Metabolic Network-Based Drug Target Identification, International Journal of Data Mining and Bioinformatics, 3:2, pages 124-144, 2009.
- Laukik Chitnis, Alin Dobra and Sanjay Ranka. Analyzing the techniques that improve fault tolerance of aggregation trees in sensor networks. Journal of Parallel and Distributed Computing, Vol. 69 (12), pp. 950-960, 2009.
- Jun Liu, Nirmalya Bandyopadhyay, Sanjay Ranka, Michael Baudis, Tamer Kahveci. Inferring Progression Models for CGH data, Journal *of Bioinformatics*, Vol. 25:17, pp. 2208-2215, 2009.
- Kannan Rajah, Sanjay Ranka, Ye Xia, Advance Reservation and Scheduling for Bulk Transfers in Research Networks, *IEEE Transactions on Parallel and Distributed Systems*, Vol. 20(11), pp. 1682-1697, 2009.
- Laukik Chitnis, Alin Dobra, and Sanjay Ranka, Fault tolerant aggregation in heterogeneous sensor networks. Journal of Parallel and Distributed Computing. Vol 69(2): 210-219 (2009).
- Kannan Rajah, Sanjay Ranka and Ye Xia, Scheduling Bulk File Transfer with Start and End Times, Scheduling Bulk File Transfers with Start and End Times, *Computer Networks*, Vol 52(5), April 2008, pp. 1105-1122.
- Laukik Chitnis, Alin Dobra and Sanjay Ranka. Aggregation Methods for Large Scale Sensor Networks. *ACM Transactions on Sensor Networks*, Volume 4, Issue 2, pp. 1-36, March 2008.
- Manas Somaiya, Chris Jermaine and Sanjay Ranka, Learning Correlations Using the Mixture-Of-Subsets Model. *ACM Transactions on Knowledge Discovery from Data*, Volume 1, Number 4, 2008, pp 1-42.

## Name: GERHARD RITTER

Education: PhD, Mathematics, University of Wisconsin-Madison, 1971

#### Academic experience:

- UF Florida Blue Key Distinguished Professor, 2004-present
- UF Interim Chair of CISE, July 2011-present
- UF Professor Emeritus, 2007-present
- UF Director, Center for Computer Vision and Visualization, 1986-2006
- UF Professor, CISE, 1986-2007
- UF Professor, Mathematics, 1986-2007
- UF Associate Professor, Mathematics, 1981-2006
- UF Assistant Professor, Mathematics, 1971-1981

## Non-academic experience:

- Research Geophysicist, Texaco, Inc., Bellaire Research Labs, Bellaire, Texas, 1980
- Director of Research and Development, Intelligent Vision Systems (IVS), Inc., Gainesville, Florida, 1990-92

#### Certifications or professional registrations: none

#### Current membership in professional organizations: IEEE, INNS, SPIE, MAA

#### Honors and awards:

- European Academy of Sciences Member (Citation for fundamental work in computer vision and pattern recognition) 2002-present.
- Fellow SPIE
- IEEE Senior Member
- General Ronald W. Yates Award for Excellence in Technology Transfer (1998)
- International Federation for Information Processing (IFIP) Silver Core Award (1989).

## Service activities:

- Member, Advisory Board for Migrant Education, Putnam County, FL. 2002-present.
- Editor-in-Chief, Journal of Mathematical Imaging and Vision, 1990-present.
- Chief Editor, Computation y Sistemas, CONACYT journal, 2001-2009.
- Member Advanced Sensors Committee, Key Technologies for the 1990s, Deputy Under Secretary of Defense for Research and Advanced Technology (1989).
- Member, Advanced technology research emerging technologies advisory panel to the Deputy Under Secretary of Defense for Research and Advanced Technology (1988).
- Panel Member, Desert Storm Technology: Conversion to Peacetime Applications led by Senator Graham, 1991.
- Founding Member and first Chair, SIAM Activity Group on Imaging Science (SIAG-IS), 1998-2003.
- Chair, Session on Morphological and Fuzzy Neural Networks, FUZZ-IEEE, 2003.

- Chair, SIAM Symposia on Imaging Science, 2000.
- Co-chair, Special Session, IEEE World Congress on Computational Intelligence (WCCI), 2006.
- Program Chair, SPIE Program on Mathematical Imaging Science, 1990-present.
- Editorial Board, Journal of Pattern Analysis and Applications, 1997-present

## Most important publications and presentations from the past five years:

- G.X. Ritter and G. Urcid, Perfect Recovery from Noisy Input Patterns with a Dendritic Lattice Associative Memory, Proceedings of the International Joint Conference on Neural Networks (IEEE/INNS), San Jose, CA, 2011, pp. 503-510.
- X. Ritter and G. Urcid. "Lattice Algebra Approach to Endmember Determination in Hyperspectral Imagery." Advances in Imaging and Electron Physics, Vol. 160. Edited by P. Hawkes. Academic Press: Burlington, Massachusetts, 2010, pp. 113-169.
- Urcid, J.C. Valdiviezo, G.X. Ritter, Lattice Associative Memories for Segmenting Color Images in Different Color Spaces, IEEE Conference on Hybrid Artificial Intelligence Systems (HAIS), San Sebastian, Spain, 2010
- G.X. Ritter and G. Urcid, Learning in Lattice Neural Networks that Employ Dendritic Computing, Computational Intelligence Based on Lattice Theory Vol. 67 of Studies in Computational Intelligence. Edited by V.G. Kaburlasos and G.X. Ritter. Springer Science+Business Media: Berlin Heidelberg, 2007, pp 25-44.
- Urcid and G. X. Ritter. "Noise Masking for Pattern Recall Using a Single Lattice Matrix Associative Memory." Computational Intelligence Based on Lattice Theory. Vol. 67 of Studies in Computational Intelligence. Edited by V.G. Kaburlasos and G.X. Ritter. Springer Science+Business Media: Berlin Heidelberg, 2007, pp. 81-100.
- Barmpoutis and G.X. Ritter. "Orthonormal Basis Lattice Neural Networks" Computational Intelligence Based on Lattice Theory Vol. 67 of Studies in Computational Intelligence. Edited by V.G. Kaburlasos and G.X. Ritter. Springer Science+Business Media: Berlin Heidelberg, 2007, pp. 45-58.

## Name: SARTAJ SAHNI

Education: Ph.D., Computer Science, Cornell University, 1973.

## Academic experience:

- 2001 2011 Chair, CISE, University of Florida
- 1998 Present Distinguished Professor, CISE, University of Florida
- 1990 1998 Professor, CISE, University of Florida
- 1981 1990 Professor, Computer Science, University of Minnesota
- 1977 1981 Associate Professor, Computer Science, University of Minnesota
- 1973 1977 Assistant Professor, Computer Science, University of Minnesota

## Non-academic experience: none

## Certifications or professional registrations: none

**Current membership in professional organizations:** European Academy of Sciences, Fellow of ACM, IEEE, and AAAS

## Honors and awards:

- IEEE Computer Society Taylor L. Booth Education Award 1997.
- Distinguished Alumnus Award, Indian Institute of Technology, Kanpur, 2001.
- IEEE Computer Society W. Wallace-McDowell Award, 2003..
- ACM Karl Karlstrom Outstanding Educator Award, 2003.
- Best Paper Award. Innovations and Real-Time Applications of Distributed Sensor Network (DSN) Symposium, 2006.
- Best Paper Award. International Conference on Networking, 2007.
- Honorary Professor, Asia University, Taichung, Taiwan, 2009.
- IEEE Computer Society Technical Committee on Parallel Processing (TCPP) Outstanding Service Award, 2010.
- IEEE Computer Society Continuous Service Award, 2010

# Service activities:

- Co-Editor-in-Chief, Jr of Parallel & Distributed Computing, 1992-2010.
- Managing Editor, International Journal of Foundations of Computer Science, 1999-.
- Member, Editorial Board, Parallel Processing Letters, 2001-.
- Editor-in-Chief, Computer and Information Science Series, Chapman & Hall/CRC, 2002-
- Member, Editorial Board, Intl. J. of Computational Science and Engineering, 2003-.
- Member, Editorial Board, Intl. J. of High Performance Computing & Networking, 2004-.
- Member, Editorial Board, International Journal of Distributed Sensor Networks, 2004-.
- Member, Advisory Board, Intl. J. of Pervasive Computing and Communications, 2004-.
- Member, Intl. Advisory Board, Sultan Qaboos University Journal for Science, 2005-.
- Member, Editorial Advisory Board, Enterprise Info. Systems, Taylor and Francis. 2006-.
- Member, Editorial Board, Lecture Notes on ICST Activities (Inst for Computer Sciences, Social-Informatics, and Telecommunications Engineering), Springer Verlag, 2008-.
- Member, Editorial Advisory Board, Intl. J. of Contemporary Computing, 2010-.
- Steering committee member for many international conferences.

• General chair and program chair for many international conferences.

# Most important publications and presentations from the past five years:

- Wang and S. Sahni, Optical transpose systems: models and algorithms. Handbook of Parallel Algorithms, Chapman-Hall/CRC Press, 2007. Ed. S. Rajasekeran and J. Reif.
- T. Mishra and S. Sahni, Green TCAM-based Internet routers, Handbook of Green Computing, Chapman-Hall/CRC Press, 2011. Ed. I. Ahmed and S. Ranka.
- K. Kim and S. Sahni, Efficient construction of pipelined multibit-trie router-tables. IEEE Transactions on Computers, 56, 1, 2007, 32-43.
- H. Lu and S. Sahni, O(log W) multidimensional packet classification. IEEE/ACM Transactions on Networking, 15, 2, 2007, 462-472.
- S. Kamath, S. Sahni, J. Li, S. Ranka, and J. Palta, Generalized field splitting algorithms for optimal IMRT delivery efficiency. Physics in Medicine and Biology, 52, 2007, 1-14.
- X. Xu and S. Sahni, Approximation algorithms for sensor deployment. IEEE Transactions on Computers, 56, 2007, 1681-1695.
- S. Chen, M. Song, and S. Sahni, Two techniques for fast computation of constrained shortest paths. IEEE/ACM Transactions on Networking, 16, 1, 2008, 105-115.
- W. Lu and S. Sahni, Packet classification using space-efficient pipelined multibit tries. IEEE Transactions on Computers, 57, 5, 2008, 591-605.
- W. Lu and S. Sahni, Succinct representation of static packet classifiers. IEEE/ACM Transactions on Networking, 17, 3, 2009, 803-816.
- J. Park and S. Sahni, Power assignment for symmetric communication in wireless sensor networks. International Journal on Distributed Sensor Networks, 5, 2, 2009, 185-200.
- W. Lu and S. Sahni, Efficient two-dimensional multibit tries for packet classification. IEEE Transactions on Computers, 58, 12, 2009, 1695-1709.
- X. Xu, N. Rao, and S. Sahni, A computational geometry method for localization using differences of distances. ACM Transactions on Sensor Networks, 6, 2, 2010, 25 pages.
- Jung, S. Ranka, and S. Sahni, Topology aggregation for e-Science networks, International Journal of Next-Generation Computing, Invited Paper, 1, 1, 2010, 1-15.
- W. Lu and S. Sahni, Low power TCAMs for very large forwarding tables. IEEE/ACM Transactions on Networking, 18, 3, 2010, 948-959.
- W. Lu and S. Sahni, Recursively partitioned static router tables. IEEE Transactions on Computers, 59, 12, 2010, 1683-1690.
- T. Mishra and S. Sahni, PETCAM--A power efficient TCAM architecture for forwarding tables. IEEE Trasactions on Computers, to appear.
- S. Rajasekaran, V. Kundeti, R. Birge, V. Kumar, and S. Sahni, Efficient algorithms for computing with protein-based volumetric processors. IEEE Trasactions on Nanotechnology, to appear.
- Y. Li, S. Ranka, and S. Sahni, In advance path reservation for file transfers in e-science applications, Journal of Supercomputing, to appear.

# Most recent professional development activities:

- Attended many international conferences
- See also service activities above

## Name: BEVERLY SANDERS

Education: Ph.D., Applied Mathematics, Harvard University, 1985

## Academic experience:

- Associate Professor, CISE Department, University of Florida, 1995-present
- California Institute of Technology, visiting Associate Professor (1994-1995, on leave from ETHZ).
- Swiss Federal Inst. of Technology (ETH Zurich), Assistant Professor, 1990-1995.
- Swiss Federal Inst. of Technology (ETH Zurich), Senior Research Associate, 1986-1990.
- University of Maryland, Assistant Professor, 1985-1986.

## Non-academic experience:

- ATT Bell Labs. Engineer. Summer 1981.
- Hughes Aircraft Company, Engineering Aid: Radar Systems Analysis, part time/summers, 1978-1980.

## Certifications or professional registrations: none

**Current membership in professional organizations:** ACM, IEEE, IFIP WG10.3 on Concurrent Programming

#### Honors and awards:

## Service activities:

- Program committee for IEEE/ACM Conf on Automated Software Engineering 2010
- Program committee for IEEE/ACM Conf on Automated Software Engineering 2011.
- Many other program committees and reviewing activities less recently)

- Beverly A Sanders, Rod Bartlett, Erik Deumens, Victor Lotrich, and Mark Ponton, "A block-oriented language and runtime system for tensor algebra with very large arrays. Proceedings of the IEEE Conference on High Performance Computing Networking, Storage and Analysis (Supercomputing 2010), New Orleans.
- KyungHee Kim, Tuba Yavuz-Kahveci, Beverly A. Sanders: JRF-E: using model checking to give advice on eliminating memory model-related bugs. Proceedings of the 25th IEEE/ACM International Conference on Automated Software Engineering (ASE 2010): 215-224, Antwerp.
- Deumens, V. F. Lotrich, A. S. Perera, R. J. Bartlett, N. Jinda, B. A. Sanders The super instruction architecture: A framework for high-productivity parallel implementation of coupled-cluster methods on petascale computers. Annual Reports for Computational Chemistry. 2011.
- Berna L. Massingill, Timothy G. Mattson, Beverly A. Sanders, Reengineering for Parallelism: an entry point into PLPP for legacy applications, Concurrency and Computation: Practice and Experience, Volume 19, Issue 4, Pages 369-569 (25 March 2007)

- Sanders and E. Deumens and V. Lotrich and M. Ponton. Refactoring a Language for Parallel Computational Chemistry. Second Workshop on Refactoring Tools. Nashville, Tennessee. Oct. 19, 2008.
- KyungHee Kim, Tuba Yavuz-Kahveci, and Beverly A. Sanders. Precise Data Race Detection in a Relaxed Memory Model using Heuristic-based Model Checking, Proceedings of the 24th ACM/IEEE Conference on Automated Software Engineering, 2009.
- Victor Lotrich, Norbert Flocke, Mark Ponton, Beverly A. Sanders, Erik Deumens, Rodney J. Bartlett. An Infrastructure for Scalable and Portable Parallel Programs for Computational Chemistry Proceeding of the ACM International Conference on Supercomputing. June, 2009.
- Beverly A. Sanders. The Shared Map Pattern. Proceedings of the Workshop on Parallel Programming Patterns (ParaPLoP 2010) March 30-31, 2010.
- V. F. Lotrich, J. M. Ponton, A. S. Perera, E. Deumens, R. J. Bartlett, B. A. Sanders, "Super instruction architecture for petascale electronic structure software: the story", Mol. Phys., p. 3323, vol. 108, (2010)
- Beverly A Sanders, Rod Bartlett, Erik Deumens, Victor Lotrich, and Mark Ponton, "A block-oriented language and runtime system for tensor algebra with very large arrays. Proceedings of the IEEE Conference on High Performance Computing Networking, Storage and Analysis (Supercomputing 2010), New Orleans.

## Name: MARK SCHMALZ

Education: Ph.D. Computer Science (in Image Compression) University of Florida 1996

## Academic experience:

- Associate Scientist, CISE, University of Florida, 2003-present
- Assistant Scientist, CISE, University of Florida, 1998-2003
- Visiting Assistant Professor, CISE, University of Florida, 1996-1998

## Non-academic experience:

- UltraHiNet, LLC, Gainesville, FL
- Research/Scientist, (parallel high-performance computing), 2008-present
- University of Florida, Gainesville, FL
- Research/Teaching Assistant Department of CISE, 1990-1996
- Research Assistant, Center for Computer Vision and Visualization 1989-1990
- Harbor Branch Oceanographic Institution Ft. Pierce, FL
- Electrical Engineer, Division of Engineering Res. and Development, 1985-1988
- Research Assistant, Department of Physical Oceanography, 1983-1985
- Applications Programmer, Department of Computer Services, 1982-1983

## Certifications or professional registrations: none

## Current membership in professional organizations: ACM, IEEE, SPIE, Tau Beta Pi

## Honors and awards:

- Nominated for University of Florida College of Engineering Teaching/Advisement Awards, 2003
- Best Paper Award, SCI-2002 World Multiconference on Systemics, Man, and Cybernetics, *Conference on Medical Imaging*
- University of Florida College of Liberal Arts and Sciences Research Award, *Laryngeal Imaging* (Co-PI with C. Sapienza as PI), 2001

# Service activities:

- Member, Electronic Data Subcomittee of the Traffic Records Coordinating Committee (TRCC), State of Florida, 2011-present
- Member, Traffic Records Electronic Dataset Subcommittee (TREDS) of the Traffic Records Coordinating Committee (TRCC), State of Florida, 2009-2010
- Reviewer: IEEE Transactions on Parallel and Distributed Systems (IEEE Press), Journal of Electronic Imaging (SPIE), Journal of Mathematical Imaging and Vision (Kluwer), Optical Engineering (SPIE), Pattern Analysis and Applications (Springer-Verlag), VLSI Design Journal (Gordon & Breach)
- Member, Technical Organizing Committee, Optical Engineering and Applications Program, SPIE Optics and Photonics Symposium, San Diego, CA, August 2009
- Member, Executive Committee, Optical Engineering and Applications Program, SPIE Optics and Photonics Symposium, San Diego, CA, August 2007

- Member, Technical Organizing Committee, Optical Engineering and Applications Program, SPIE Optics and Photonics Symposium, San Diego, CA, August 2007
- Conference Co-Chair, Mathematics of Data/Image Pattern Recognition, Compression, and Encryption XIV, with Applications, to be held in San Diego, CA, August 2011
- Conference Co-Chair, Mathematics of Data/Image Pattern Recognition, Compression, and Encryption IX XIII, with Applications, San Diego, CA, August 2006 2010

# Most important publications and presentations from the past five years:

- A Helal, M. Mokhtari, B. Abdulrazak and M. Schmalz. "Introduction", The Engineering Handbook on Smart Technology for Aging, Disability and Independence, John Wiley & Sons. Computer Eng. Series, Copyright 2007.
- Chapman, W., S. Ranka, S. Sahni, M. Schmalz, and U. Majumder. "Parallel processing techniques for the processing of synthetic aperture radar data on FPGAs", in Proceedings of the IEEE Intl. Symposium on Signal Processing and Information Technology (2010).
- Helal, M. Schmalz, and D. Cook, "Smart home-based health platform for behavioral monitoring and alteration of diabetes patients", Journal of Diabetes Science and Technology, 3(1):1-8 (2009).
- M. Al-Turkistany, A. Helal, and M. Schmalz. "Adaptive wireless thin-client model for mobile computing", Wireless Communications and Mobile Computing 9:47-59 (2009).
- Ritter, G.X., G. Urcid, and M.S. Schmalz. "Autonomous single-pass endmember approximates using lattice auto-associative memories", Neurocomputing 72:2101-2110 (2009).
- Li, Y., S. Ranka, S. Sahni, and M. Schmalz. "Network centered muliple resource scheduling in e-science applications", Proceedings of the GridNets Conference, Lecture Notes in Computer Science 25:37-44, Springer Verlag (2009).
- Schmalz, M.S. and G. Key. "Noise-tolerant hyperspectral signature classification in unresolved object detection using tabular nearest-neighbor encoding", in Proceedings of the AMOS 2007 Conference, Maui Hawaii (2008).
- Schmalz, M.S. and L.A. Conway. "IT/CS workshop Multimodal, multimedia courseware for integrating technical concepts and humanistic context", in Proceedings of the ACM SIGITE Conference, Cincinnati Ohio (2008).
- Schmalz, M.S. and G. Key. "Noise-tolerant hyperspectral signature classification in unresolved object detection using tabular nearest-neighbor encoding", in Proceedings of the AMOS 2007 Conference, Maui Hawaii (2008).
- Schmalz, M.S. and G. Key. "Hyperspectral signature classification with tabular nearestneighbor encoding", in Proceedings of the AMOS 2007 Conf., Maui Hawaii (2008).
- Schmalz, M.S. and G.X. Ritter. "Spectral discrimination in noisy sensors using morphological neural computation", in Proceedings of the AMOS 2006 Conference, Maui Hawaii (2007).

# Most recent professional development activities:

- Numerous invited talks, conferences, over \$5.5 million in grants or contracts (PI or Co-PI) over past 10 years
- See also service activities above

## Name: MARKUS SCHNEIDER

**Education:** Doctoral degree (Dr. rer. nat., Ph.D.) in Computer Science, Fern Universität Hagen, Hagen, Germany, 1995

#### Academic experience:

- Department of Computer and Information Science and Engineering (CISE), University of Florida, Gainesville, Florida, USA; Associate Professor; since August 2008; full time
- Department of Computer and Information Science and Engineering (CISE), University of Florida, Gainesville, Florida, USA; Assistant Professor; January 2002–August 2008; full time
- Department of Computer Science, FernUniversität Hagen, Hagen, Germany; University assistant ("Hochschulassistent (C1)"); June 1996–December 2001; full time
- Department of Computer Science, FernUniversität Hagen, Hagen, Germany; Scientific associate ("wissenschaftlicher Mitarbeiter"); July 1991–June 1996; full time

#### Non-academic experience: none

#### Certifications or professional registrations: none

#### Current membership in professional organizations: ACM, ACM SIGSPATIAL

#### Honors and awards:

• NSF CAREER award

#### Service activities:

- Curriculum committee
- Graduate admissions committee
- Chair and member of PhD committees
- Chair and member of Master thesis committees
- Co-founder of ACM SIGSPATIAL
- Treasurer of ACM SIGSPATIAL from 2008 to 2011
- Reviewer for many journals, conferences, and workshops
- Workshop Chair of the 19th ACM SIGSPATIAL Int. Conf. on Advances in Geographic Information Systems (ACM SIGSPATIAL GIS) 2011
- Dagstuhl Seminar titled Data Warehousing: from Occasional OLAP to Real-time Business Intelligence

- Hechen Liu & Markus Schneider. Detecting the Topological Development in a Complex Moving Region. Journal of Multimedia Processing and Technologies (JMPT), 1(3), 160-180, 2010.
- Markus Schneider. Soft Computing Techniques in Spatial Databases. Handbook of Research on Soft Computing Applications for Database Technologies: Techniques and Issues. IGI Global, 49-71, 2010.
- Virupaksha Kanjilal & Markus Schneider. Modeling and Querying Spatial Networks in Databases. Journal of Multimedia Processing and Technologies (JMPT), 1(3), 142-159, 2010.
- Alejandro Pauly & Markus Schneider. VASA: An Algebra for Vague Spatial Data in Databases. Informations Systems, 35(1), 111-138, 2010.
- Markus Schneider. Spatial and Spatio-Temporal Data Models and Languages. Encyclopedia of Database Systems. Springer-Verlag, 2009.
- Reasey Praing & Markus Schneider. Topological Feature Vectors for Exploring Topological Relationships. Int. Journal on Geographical Information Science (IJGIS), 23(3), 319-353, 2009.
- Markus Schneider. Moving Objects in Databases and GIS: State-of-the-Art and Open Problems. Research Trends in Geographic Information Science. Springer-Verlag, 169-188, 2009.
- Reasey Praing & Markus Schneider. Efficient Implementation Techniques for Topological Predicates on Complex Spatial Objects. GeoInformatica, 12(3), 313-356, 2008.
- Markus Schneider. Fuzzy Spatial Data Types for Spatial Uncertainty Management in Databases. Handbook of Research on Fuzzy Information Processing in Databases. Information Science Reference, 490-515, 2008.

Most recent professional development activities: see service activities above

# Name: MEERA SITHARAM

Education: 1990 PhD in CS, University of Wisconsin-Madison

# Academic experience:

- 1998– Associate Professor of CISE, University of Florida (UF Tenure: 2002)
- 1997-1998 Visiting Associate Professor of CS, Purdue University
- 1996-1999 Assoc Professor of Math and CS, Kent State University(KSU Tenure: 1996)
- 1991-1995 Assistant Professor of Math and CS, Kent State University
- 1990–1991 A. v. Humboldt postdoc fellowship, University of Bonn, Germany

# Non-academic experience: none

# Certifications or professional registrations: none

# Current membership in professional organizations:

# Honors and awards:

# Service activities:

- International Conference Program Committees:
- ACM SAC, Geometric constraints and reasoning, on PC annually since 2006.
- ADG Automated deduction in geometry, every two years, on PC since 2004.
- ASCM (Asian symposium on Computational Mathematics), on PC 2005-2007.
- Association for Symbolic Annual meeting, 2007, Gainesville (Organizing committee)
- IASTED-ACST (Advances in Computer Sci. Tech.), annually, on PC 2003-2009.
- IASTED-NANA (Nanoscience and technology), 2009.

# Most important publications and presentations from the past five years:

- M. B'ona, M. Sitharam, A. Vince "Tree orbits under the action of the icosahedral group and enumeration of macromolecular assembly pathways," Bull. Math. Bio, special issue on Algebraic Biology, to appear, 2011
- Aysegul Ozkan(grad student), Meera Sitharam, EASAL: efficient atlasing, search and analysis of assembly landscapes, Proceedings of IEEE BiCoB, New Orleans, 2011.
- K. Haller, A. Lee, M. Sitharam, I. Streinu, N. White (alphabetical order) "Body-and-Cad constraint systems" ACM-SAC Geometric constraints and Reasoning, 2009 and FwCG 2008. Computational Geometry Theory and Applications.
- J. Cheng (grad student), M. Sitharam http://arxiv.org/pdf/1010.4052 "Better bounds for rank of 3D rigidity matroid of general graphs," Proceedings of FWCG: Fall Workshop in Computational geometry, Oct. 2010
- M. Sitharam, Y. Zhou (grad student), J. Peters Reconciling Combinatorial Preprocessors for Geometric constraint systems International Journal of Computational Geometry and Applications, 20(6):631651, 2010.
- M. Sitharam, J. Peters, Y. Zhou (grad student), "Combinatorial optimization of algebraic complexity of minimal geometric constraint sytems" J. of Symbolic Computation, 2010

- M. Sitharam, H. Gao http://arxiv.org/abs/0809.3935 Characterizing graphs with convex configuration spaces, Discrete and Computational Geometry 2009.
- J. Cheng, M. Sitharam, I. Streinu, "Nucleation-free 3D rigidity," Canadian Conference on Computational Geometry (CCCG), 2009.
- M. B'ona, M. Sitharam "Icosahedral symmetry analysis of virus assembly pathways," Computational and Mathematical methods in medicine, special issue on Mathematical Virology (Stockley and Twarock special Ed.s) 2009.
- H. Gao, M. Sitharam "Henneberg graphs with efficient configuration spaces" Proceedings of the ACM-SAC Geometric constraints and Reasoning, 2009.
- Lomonosov, M. Sitharam "Stability, Optimality and Complexity of Network Games with Player Dropouts," Scalable Computation Journal (Used to be "Parallel and Distributed Computation" Journal), Vol 8, No. 1, 2007
- O. Boykin, M. Sitharam, M. Tarifi, P. Wocjan "Nonextendibility of Mutually unbiased bases," QIP symposium (Quantum Information Processing), February 2007
- O. Boykin, M. Sitharam, P. Tiep, P. Wocjan "Orthogonal decomposition of lie algebras and Mutually Unbiased Bases" QIC journal (Quantum Information and Computation), Vol 7, No 4, 2007.
- M. Sitharam "Characterizing Well-formed systems of incidences for resolving collections of rigid bodies" Int. J. Comput. Geometry Appl., Vol. 16, No. 5-6, 591-615. 2006.
- M. Sitharam, J. Oung, A. Arbree and Y. Zhou, "Mixing features and variational constraints in 3D" Computer Aided Design, Vol. 38, pp 22-38, 2006.
- M. Sitharam, A. Arbree, Y. Zhou, N. Kohareswaran, "Solution management and navigation for 3D geometric constraint systems" ACM Trans. Graph., Vol 25, No. 2, 194–213, 2006.
- M. Sitharam, M. Agbandje-Mckenna "Sampling virus assembly pathways: avoiding dynamics using geometric constraint decomposition" Vol 13, Number 6, Journal of Computational Biology, pp 1232-1265, 2006.

# Most recent professional development activities:

- Running a local elementary school math circle for 4 years with help from Tau Beta Pi and other UF student organizations; Member of UF-Gainesville committee on mathematical circles in local schools.
- As faculty advisor of Gators for Asha, exploring P2P social entrepreneurship: partnering with grassroots nonprofits locally and in India applying information and computation principles to engineer social movements by designing protocols for collaborative, distributed, participatory decision making; building transparent and efficient P2P economies (including manufacturing and finance) and sustainable community resource base.
- As faculty advisor of Spicmacay, exploring global P2P musicmaking. Honors and Awards in the past 5 years (1) 1 NSF grant, 1 joint NSF-NIGMS grant, one gift from SolidWorks Corp., and 1 UF seed grant. (2) 1 Keynote talk at (International conference on applied computing) ICAC in 2009;
- At least 2 invited addresses talks every year.
- See also service activities above

## Name: MY THAI

Education: Ph.D. in Computer Science, University of Minnesota, Sep 2001 – Dec 2005

## Academic experience:

- Associate Professor, CISE Department, University of Florida, 2011-present
- Assistant Professor, CISE Department, University of Florida, Aug 2006-2011

#### Non-academic experience: none

## Certifications or professional registrations: none

## Current membership in professional organizations: IEEE, ACM

## Honors and awards:

- UF Provost's Excellence Awards for Assistant Professor, 2011
- National Science Foundation (NSF) CAREER Award, 2010-2015
- DTRA Young Investigator Award, 2009-2011
- Outstanding Service Award, Int Conf on Bioinformatics and Computational Biology (BIOCOMP), 2007

## Service activities:

- Book Series Editor: Springer Briefs in Optimization.
- Associate Editor: Journal of Combinatorial Optimization, Optimization Letters, Ad Hoc and Wireless Sensor Networks
- Guest Editor: Algorithmica, Ad Hoc Networks, Discrete Mathematics, Algorithms and Applications
- Conference and PC co-Chairs: SIMPLEX 11, DIS 11, COCOON 10
- NSF Panelist, 2006, 2008, 2010
- College of Engineering Commencement Marshall, 2007-2011
- Scholarship and Awards Committee, 2007-2011
- CISE Ambassador, 2006-2008
- Judge for the UF Engineering and Science Fair, 2006-2007

# Most important publications and presentations from the past five years:

- M. T. Thai, Group Testing Theory in Network Security: Advanced Solutions, Springer Publisher, Aug 2011.
- M. T. Thai and P. Pardalos (eds), Handbook of Optimization in Complex Networks: Theory and Applications, Springer Publisher, 2011, ISBN: 978-1461407539
- M. T. Thai and P. Pardalos (eds), Handbook of Optimization in Complex Networks: Communication and Social Networks, Springer Publisher, 2011, ISBN: 978-1461408567
- T. N. Dinh, Y. Xuan, M. T. Thai, P. Pardalos, and T. Znati, On New Approaches of Assessing Network Vulnerability: Hardness and Approximation, IEEE/ACM Transactions on Networking (ToN), 2011.
- Y. Xuan, Y. Shen, N. P. Nguyen, and M. T. Thai, A Trigger Identification Service of

Defending Reactive Jammers in WSNs, IEEE Transactions on Mobile Computing (TMC), 2011.

- Y. Xuan, I. Shin, M. T. Thai, and T. Znati, Detecting Application Denial-of-Service Attacks: A Group Testing Based Approach, IEEE Transactions on Parallel and Distributed Sysms, vol. 21, no. 8, pp. 1203-1216, 2010.
- M. T. Thai and T. Znati, On the Complexity and Approximation of Non-unique Probe Selection Using d-Disjunct Matrix, Journal of Combinatorial Optimization, vol. 17, no. 1, pp 45-53, 09.
- P. Deng, M. T. Thai, and W. Wu, Efficient Non-Unique Probes Selection Algorithms for DNMicroarray, BMC Genomics, vol. 9, suppl. 1, 2008.
- M. T. Thai, R. Tiwari, and D.-Z. Du, On Construction of Virtual Backbone in Wireless Ad Hoc Networks with Unidirectional Links, IEEE Transactions on Mobile Computing (TMC), vol. no. 8, pp. 1-12, 2008.
- M. T. Thai, N. Zhang, R. Tiwari, and X. Xu, On Approximation Algorithms of k-Connected m-Dominating Sets in Disk Graphs, Theoretical Computer Science, vol. 385, no. 1-3, pp. 459, 2007.
- M. T. Thai, F. Wang, D. Liu, S. Zhu, and D.-Z. Du, Connected Dominating Sets in Wireless Networks with Different Transmission Ranges, IEEE Transactions on Mobile Computing (TMC), vol. 6, no. 7, July, 2007.
- N. P. Nguyen, T. N. Dinh, S. Tokala, and M. T. Thai, Overlapping Communities in Dynamic Networks: Their Detection and Mobile Applications, in Proceedings of ACM International Conference on Mobile Computing and Networking (MobiCom), 2011
- Y. Shen, N. P. Nguyen, and M. T. Thai, Exploiting the Robustness on Power-Law Networks, in Proceedings of the 17th Int Computing and Combinatorics Conference (COCOON), 2011
- N. P. Nguyen, T. N. Dinh, Y. Xuan, and M. T. Thai, Adaptive Algorithms for Detecting Community Structure in Dynamic Social Networks, in Proceedings of the IEEE Communications Society (INFOCOM), 2011
- T. N. Dinh, Y. Xuan, M. T. Thai, EK Park, and T. Znati, On Approximation of New Optimization Methods for Assessing Network Vulnerability, in Proceedings of the IEEE Communications Society (INFOCOM), 2010
- M. T. Thai, Y. Xuan, and T. Znati, On Detection of Malicious Users Using Group Testing Techniques, in Proceedings of Int. Conf. on Distributed Computing Systems (ICDCS), 2008.

# Most recent professional development activities: see service activities above

# Name: STEVE THEBAUT

Education: Ph.D., Computer Science, Purdue University, 1983

## Academic experience:

- University of Florida, CISE Dept., Associate Chairman, 2000 Present, full time
- University of Florida, CISE Dept., Undergraduate Coordinator, 2001 Present
- University of Florida, CISE Dept., Site Director, Software Engineering Research Center (SERC), an NSF Industry/University Cooperative Research Center, 1994–2000Hong Kong University of Science and Technology, Department of Computer Science, Visiting Scholar, 1991-1993
- University of Florida, CISE Dept., Assistant Professor, 1983 Present

# Non-academic experience:

• IBM Santa Teresa Laboratory, Academic Associate, summers of 1980, 1981, 1983, 1984

# Certifications or professional registrations: none

# Current membership in professional organizations: ASEE

## Honors and awards:

- Nominated as Outstanding UF EDGE Faculty for the Academic year 2005-2006
- IBM Post-Doctoral Research Fellowship, University of Florida, 1983-84.
- Maurice H. Halstead Award for Research Excellence in Software Engineering, Purdue University, 1982

# Service activities:

- Chair, CISE Undergraduate Petitions Committee
- Member, Systems Facilities Committee and Commencement Representatives
- Faculty Adviser to Association of Graduate Students in CISE (ASCIE)
- College of Engineering EDGE Class Scheduling Committee
- Academic Advisor, National Technological University (NTU), Software Engineering Masters Program, 1995-2004
- Advisory Board Member, Sino Software Research Center (SSRC), Hong Kong University of Science and Technology, 1992-1995
- Associate Editor, International Journal of Computer and Software Engineering, 1990-1996
- Program Comm Member, IASTED International Conference on Advances in Computer Science and Technology (ACST), 2004, 2005, 2006
- Program Comm Member, Fourth International Conference on Computer Science, Software Engineering, Information Tech., e-Business and Applications (CSITeA'04), 2004
- Program Comm Member, International Computer Software & Applications Conference, 1990,1991,1995
- Program Comm Member, 9th Conference on Software Engineering Education, 1995

- Technical Advisor: DoD Software Technology for Adaptable, Reliable Systems (STARS) program, 1988-89
- Invited Lecturer: Software Engineering Institute (SEI), Carnegie Mellon University, 'Software Project Management,' nationally distributed video continuing ed. course, 1989
- Referee: IEEE Transactions on Software Engineering, International Journal of Computer and Information Sciences, Software-Practice & Experience, and several others
- Technical Consultant: "Automated Measurement System," Rome Air Development Center (RADC), Defense Mapping Agency, and Harris GISD, 1985.

# Most important publications and presentations from the past five years:

- "An Intelligent Plan Selection Model for BDI Frameworks," (with Umut Sargut), European Workshop on Multi-Agent Systems (EUMAS'07), Hammamet, Tunisia, December 2007.
- "Software Engineering Foundations," a series of technical lectures delivered to the faculty and staff of the Infosys Education and Research Department, Mysore, India, July-August, 2009.
- Invited seminar: "Three Talks for the Price of One: Making Meetings Work, Reviews and Inspections, Test Plans and Planning," IPPD Guest Lecture, Fall 2010, UF College of Engineering, University of Florida.

# Most recent professional development activities:

- Participated in 2010 NSF ADVANCE Workshop on Recruitment and Mentoring in Engineering and Physics
- See also service activities above

# Name: ALPER UNGOR

Education: Ph.D., University of Illinois at Urbana-Champaign, 2002

## Academic experience:

- Associate Professor, CISE Department, University of Florida, 2010-present
- Assistant Professor, CISE Department, University of Florida, 2004-2010

## Non-academic experience:

• Sandia National Labs, Visiting Researcher, Summer 1999

# Certifications or professional registrations: none

# Current membership in professional organizations: ACM, SIAM

# Honors and awards:

- CAREER Award, National Science Foundation, 2009-2014
- David J. Kuck Best Ph.D. Thesis Award, UIUC
- Best Paper award (among over 360 papers submitted to) ISCIS, 2003
- Computational Science and Engineering Fellowship, UIUC, 2002
- C.L. Dave and Jane W. -S. Liu Award, UIUC, 2001
- Excellence in Teaching Award, University of Illinois at Urbana-Champaign, 1998.

# Service activities:

- Program Committee Member for International Sym. on Voronoi Diagrams, June 2009.
- Program Committee Member for Sym. on Geometric Processing, July 2007
- Program Committee Member for ACM Symp. on Computational Geometry, June 2006.
- Chair of the International Meshing Roundtable (IMR), Oct 2004
- Organizer and Chair of the Workshop on Meshing for Computational Biology, IMR 2004
- Program Committee Member for Intl Symp.on Computer and Information Sciences (ISCIS), 2004
- Program Committee Member for the International Meshing Roundtable (IMR), Oct 2003.
- Program Committee Member for Intl Symp.on Computer and Information Sciences (ISCIS), 2003.

# Most important publications and presentations from the past five years:

- Hale Erten, Alper Üngör: Quality Triangulations with Locally Optimal Steiner Points. SIAM Journal on Scientific Computing 31(3): 2103-2130 (2009)
- Alper Üngör: Off-centers: A new type of Steiner points for computing size-optimal quality-guaranteed Delaunay triangulations. Comput. Geom. 42(2): 109-118 (2009)
- Daniel A. Spielman, Shang-Hua Teng, Alper Üngör: Parallel Delaunay Refinement: Algorithms and Analyses. Int. J. Comput. Geometry Appl. 17(1): 1-30 (2007)
- Zhao, H. Erten and A Ungor, Mesh Smoothing Algorithms for Complex Geometric Domains, Proc. of the 18<sup>th</sup> Int. Meshing Roundtable (IMR)}, 2009.
- H. Erten and A. Ungor, Computing Triangulations with No Small No Large Angles,

International Symposium on Voronoi Diagrams (ISVD) 2009.

- A.Saifullah and A Ungor, A Simple Algorithm For Triconnectivity of a Multigraph, Computing: The Australasian Theory Symposium (CATS) Wellington, New Zealand, 2009. (also published as a technical report at Washington University, WUCSE-2009-6).
- H. Erten and A. Ungor, Computing Acute and Non-obtuse Triangulations, Canadian Conference on Computational Geometry (CCCG) 2007: 205-208.
- Cem Boyaci, H. Erten and A. Ungor. Triangulations Loosing Bundles and Weight, Canadian Conference on Computational Geometry (CCCG) 2007: 201-204.
- H. Erten and A. Ungor, Triangulations with locally optimal Steiner points, Symposium on Geometry Processing (SGP) 2007: 143-152.
- R. Jampani and A. Ungor, Construction of Sparse Well-spaced Point Sets for Quality Tetrahedralizations, Proc. of the 16th Int. Meshing Roundtable (IMR), 63--80, 2007.

**Most recent professional development activities:** attended and spoke at multiple international conferences; see also service activities above.

# Name: BABA VEMURI

Education: PhD, Electrical & Computer Engineering, University of Texas at Austin, 1987

# Academic experience:

- 2010- To date: Professor and Director, Laboratory for Computer Vision, Graphics & Medical Imaging, affiliate appointment in ECE and BME Departments.
- 2003-2010: Professor and Director of the Center for Vision, Graphics and Medical Imaging (CVGMI), Dept of CISE and BME, affiliate appt. Dept of ECE, Univ Florida
- 2003-2006: University Research Foundation (UFRF) Prof., Dept of CISE, BME, ECE.
- 1999-2003: Professor, Department of CISE, BME and ECE.
- 1992-1999: Associate Professor, Department of CISE and ECE.
- 1987-1992: Assistant Professor, Department of CISE.

# Non-academic experience:

- 1989-1990: Research Sci., German Aerospace Res. Inst, Oberpfaffenhofen, Germany.
- Summer 1989: IBM TJ Watson Research Center, NY.
- Summer 1992: IBM TJ Watson Research Center, NY.

# **Certifications or professional registrations:** none **Current membership in professional organizations:** IEEE, ACM, MICCAI

# Honors and awards:

- ACM Fellow 2009
- IEEE Fellow 2001
- Plenary speaker at several conferences
- Chartered member of the Neuro-techology study section at NIH
- Member external advisory board Neuro-imaging Center, Brigham and Womens Hospital, Harvard Medical School
- UFRF Professorship 2003-06
- UF SPP award 2007.

# Service activities:

- Chair, faculty search and screening 2001-2010.
- Member, Departmental steering committee 2001- to date.
- Member, Departmental Tenure and Promotion committee 2008-2010
- Chair, Departmental Tenure and Promotion committee 2011.
- Member, COE Tenure and Promotion committee 2011.
- Associate Editor, Journal of Medical Image Analysis, Elsevier Publishing, 2000- to date.
- Associate Editor, J of Computer Vision and Image Understanding, 2000- to date.
- Area Chair, IEEE Int. Conference on Computer Vision (ICCV) 2011, Barcelona, Spain.
- Area Chair, Intl. Conf. on Info. Processing in Medical Imaging, 2011, Germany.
- Area Chair, IEEE Conf on Computer Vision and Pattern Recogniton, 2008, Alaska, USA.
- Area Chair, Intl. Conf. on Medical Image Comput. and CAI, 2008, NYC, USA.
- Program Chair, IEEE Intl. Conf. on Computer Vision 2007, Rio de Janeiro Brazil.

• Area Chair, IEEE Conference on Computer Vision and pattern Recognition, 2006,

# Most important publications and presentations from the past five years:

- Yuchen Xie, Jeffrey Ho, Baba C. Vemuri: Nonnegative Factorization of Diffusion Tensor Images and Its Applic. Intl. Conf. on Info. Proc. in Medical Imaging, 2011: 550-561.
- Meizhu Liu, Baba C. Vemuri: RBoost: Riemannian distance based regularized Boosting. IEEE Intl. Symp. On Biomedical Imaging, 2011: 1831-1834.
- Baba C. Vemuri, M. Liu, Shun-ichi Amari, Frank Nielsen: Total Bregman, Divergence and Its Applic. to DTI Analysis. IEEE Trans. Med. Imaging 30(2): 475-483 (2011).
- Ritwik Kumar, Angelos Barmpoutis, Arunava Banerjee, Baba C. Vemuri: Non-Lambertian Reflectance Modeling and Shape Recovery of Faces Using Tensor Splines. IEEE Trans. Pattern Anal. Mach. Intell. 33(3): 533-567 (2011).
- Bing Jian, Baba C. Vemuri: Robust Point Set Registration Using Gaussian Mixture Models. IEEE Trans. Pattern Anal. Mach. Intell. 33(8): 1633-1645 (2011).
- Özlem N. Subakan, Baba C. Vemuri: A Quaternion Framework for Color Image Smoothing and Segmentation. Intl. Journal of Computer Vision 91(3): 233-250 (2011).
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- Micha Feigin, Nir A. Sochen, Baba C. Vemuri: Anisotropic Alpha-Kernels and Associated Flows. SIAM Journal of Imaging Sciences 3(4): 904-925 (2010).
- Yuchen Xie, Jeffrey Ho, Baba C. Vemuri: Image atlas construction via intrinsic averaging on the manifold of images. IEEE CVPR 2010: 2933-2939.
- Meizhu Liu, Baba C. Vemuri, Shun-ichi Amari, Frank Nielsen: Total Bregman divergence and its applications to shape retrieval. IEEE CVPR 2010: 3463-3468.
- Barmpoutis, A; Hwang, M.S.; Howland, D.; Forder, J.R. and Vemuri, B.C., Regularized positive-definite fourth order tensor field estimation from DW-MRI, NeuroImage, 45 (1), S153-S162 (2009).
- Ritwik Kumar, Arunava Banerjee, Baba C. Vemuri: Volterrafaces: Discriminant analysis using Volterra kernels. IEEE CVPR 2009: 150-155.
- Fei Wang, Baba C. Vemuri, Anand Rangarajan, Stephan J. Eisenschenk: Simultaneous Nonrigid Registration of Multiple Point Sets and Atlas Construction. IEEE Trans. Pattern Anal. Mach. Intell. 30(11): 2011-2022 (2008).
- Bing Jian, Baba C. Vemuri: A Unified Computational Framework for Deconvolution to Reconstruct Multiple Fibers From Diffusion Weighted MRI. IEEE Trans. Med. Imaging 26(11): 1464-1471 (2007).
- Angelos Barmpoutis, Baba C. Vemuri, Timothy M. Shepherd, John R. Forder: Tensor Splines for Interpolation and Approximation of DT-MRI With Applic. to Segmentation of Isolated Rat Hippocampi. IEEE Trans. Med. Imaging 26(11): 1537-1546 (2007).
- N A. Lord, J Ho, B C. Vemuri, Stephan J. Eisenschenk: Simultaneous Registration and Parcellation of Bilateral Hippocampal Surface Pairs for Local Asymmetry Quantification. IEEE Trans. Med. Imaging 26(4): 471-478 (2007).

# Most recent professional development activities:

• See service activities above

# Name: 'DAISY' ZHE WANG

Education: Ph.D. Electrical Eng. and Computer Sciences, Dec., 2011 UC Berkeley

# Academic experience:

- Fall 2011 Assistant Professor, CISE Department, University of Florida
- Fall 2005-Summer2011 Ph.D. candidate, Research Assistant, Database Group, UC Berkeley
- Summer 2003-Spring 2005 Undergraduate Researcher, University of Toronto

# Non-academic experience:

- Summer 2008 Research Internship, Yahoo! Research. Santa Clara
- Spring 2008 Spring 2010 Research Collaborator, IBM Almaden Research Center
- Summer 2007 Software Engineer, Google Inc.
- Summer 2006 Research Internship, Intel Research Berkeley
- Summer 2003, 2004, 2005 Software Developer, DB2 UDB Compiler Group, IBM Toronto Lab

# Certifications or professional registrations: none

# Current membership in professional organizations: ACM, IEEE

# Honors and awards:

- UC Berkeley, Department of Electrical Engineering and Computer Sciences Stonebraker/Wong Fellowship 2009,
- UCC Berkeley, Dept of EECS, Departmental Fellowship 2005

# Service activities:

- Reviewer: ICDE2011, TKDE2011
- External Conference Reviewer: VLDB, SIGMOD, ICDE
- Founder of Women in Engineering: University of Toronto, 2004-2005.

# Most important publications and presentations from the past five years:

- Hybrid In-Database Inference for Declarative Information Extraction Daisy Zhe Wang, Michael J. Franklin, Minos Garofalakis, and Joseph M. Hellerstein, Michael Wick Proceedings of ACM SIGMOD International Conference on Management of Data, 2011.
- Selectivity Estimation for Extraction Operators over Text Data Daisy Zhe Wang, Long Wei, Yunyao Li, Frederick Reiss, and Shivakumar Vaithyanathan Proceedings of 27th IEEE International Conference on Data Engineering (ICDE), 2011.
- Querying Probabilistic Information Extraction. Daisy Zhe Wang, Michael J. Franklin, Minos Garofalakis, and Joseph M. Hellerstein Proceedings of 36th Very Large Data Base Endowment (VLDB), 2010, Vol.3: p1057-1067
- Probabilistic Declarative Information Extraction. Daisy Zhe Wang, Eirinaios Michelakis, Michael J. Franklin, Minos Garofalakis, and Joseph M. Hellerstein, Proceedings of 26th IEEE International Conference on Data Engineering (ICDE), 2010 short paper: p173-176

- BayesStore: Managing Large, Uncertain Data Repositories with Probabilistic Graphical Models. Daisy Zhe Wang, Eirinaios Michelakis, Minos N. Garofalakis, Joseph M. Hellerstein. Proceedings of 34th Very Large Data Base Endowment (VLDB), 2008, Vol1: p340-351
- WebTables: Exploring the Power of Tables on the Web. Michael J. Cafarella, Alon Halevy, Daisy Zhe Wang, Eugene Wu, Yang Zhang. Proceedings of 34th Very Large Data Base Endowment (VLDB), 2008, Vol1: p538-549.
- "Hybrid In-Database Inference for Declarative Information Extraction" VLDB Conference, June 15, 2011
- "Selectivity Estimation for Extraction Operators over Text Data" ICDE Conference, April 14, 2011
- "Querying Probabilistic Information Extraction" EMC/Greenplum Seminar, July 11, 2011
- CSAIL Seminar, MIT, November 17, 2010.
- Datbase Seminar, University of Toronto, January 5, 2010.
- "Declarative Information Extraction in a Probabilistic Database System", Info Lab Seminar, Stanford, 2009.

Most recent professional development activities: see service activities above

# Name: JOSEPH WILSON

**Education:** Ph.D., Computer Science, University of Virginia, 1985 M.S., Applied Math and Computer Science, University of Virginia, 1980 B.S., Applied Math and Computer Science, Florida State University, 1977

## Academic experience:

- Assistant Professor, CISE Department, University of Florida, 1985-present
- Associate Chair, CISE, 1994-2001

## Non-academic experience:

- Programmer, State of Florida Office of Manpower Planning, 1977-1978 Helped develop forms-oriented graphical database user interfaces in Cobol
- Software Engineer Intermetrics 1980 Maintained DARPA DEC Twenex B-Ada compiler parser and performed compiler testing using the ACVC

## Certifications or professional registrations: none

## **Current membership in professional organizations:**

- Member IEEE
- Member IEEE Data Fusion Technical Committee
- Member ACM

# Honors and awards:

- 2001-2002 ACM Professor of the Year (UF Student Chapter award)
- General Ronald W. Yates Award for Excellence in Technology Transfer, AFL, 1998.
- 1994, University of Florida Teaching Incentive Program Award Winner

## Service activities:

- IEEE IGARSS TPC Member 2010
- University of Florida Faculty Senator

## Most important publications and presentations from the past five years:

- Nicholas I. Rummelt and J.N. Wilson, "Array set addressing: an enabling technology for the efficient processing of hexagonally sampled imagery," *Journal of Electronic Imaging*, 20, 03 June 2011.
- R. Mazhar, P.D. Gader, J.N. Wilson, Matching-pursuits dissimilarity measure for shapebased comparison and classification of high-dimensional data, *IEEE Transactions on Fuzzy Systems*, 17(5), pp. 1175-1188, May 2009.
- G. Ramachandran, P.D. Gader, and J.N. Wilson, GRANMA: gradient angle model algorithm on wideband EMI data for landmine detection, *IEEE Geoscience and Remote Sensing Letters*, 7(3), July 2010, pp. 535-539.
- H. Frigui, L. Zhang, P. Gader, J.N. Wilson, K.C. Ho, A. Mendez-Vazquez, An evaluation of several fusion algorithms for anti-tank landmine detection and

discrimination, *Information Fusion*, Special issue in Information Fusion, Elsevier, 10 November 2009.

- Mazhar, R., Gader, P.D., Wilson, J.N., A matching pursuit based similarity measure for fuzzy clustering and classification of signals, *IEEE Intl. Conf. On Fuzzy Systems*, 2008, *FUZZ-IEEE 2008*, June 2008, pp. 1950-1955.
- Ho, K.C., Wilson, J.N., Gader, P.D., On the use of aggregation operator for humanitarian demining using hand-held GPR, *IEEE Intl. Conf. On Fuzzy Systems*, 2008, FUZZ-IEEE 2008, June 2008, pp. 2103-2108.
- Bolton, J., Gader. P, Wilson, J.N., Discrete Choquet integral as a distance metric, *IEEE Trans. Fuzzy Sys.*, 16(4), April 2008, pp. 107-1110.
- Ho, K.C., Carin, L., Gader, P.D., Wilson, J.N., An investigation of using the spectral characteristics from ground penetrating radar for landmine/clutter discrimination, *IEEE Trans. Geoscience and Remote Sensing*, 46(4), Part 2, April 2008, pp. 1177-1191.
- Wilson, J.N., Gader, P.D., Lee, W-H., Frigui, H., Ho, K.C., "Large-Scale Evaluation of Algorithms Using Ground Penetrating Radar for Landmine Detection and Discrimination," *IEEE Trans. Geoscience and Remote Sensing*, 45(8). Aug. 2007, pp. 2560-2572.

# Most recent professional development activities:

- *HMDS Historical Perspective*, invited presentation, L-3 Cyterra Corporation, 8 August, 2010.
- International conference session organizer and chair: Remote Sensing for Landmine and Unexploded Ordnance Identification and Removal II, IEEE International Geoscience and Remote Sensing Symposium, 8 July 2008.

## Name: YE XIA

Education: PhD, University of California, Berkeley, EECS, 2003.

## Academic experience:

- Associate professor, University of Florida, Computer and Information Science and Engineering Department. Aug. 2009 Present
- Assistant professor, University of Florida, Computer and Information Science and Engineering Department. Aug. 2003 Aug. 2009.

## Non-academic experience:

• Bell Laboratories, Lucent Technologies. Holmdel, New Jersey. 06/1994-08/1996

## Certifications or professional registrations: none

## Current membership in professional organizations: IEEE

## Honors and awards:

## Service activities:

- Member of the Technical Program Committee for the following conferences.
- Fifth International Workshop on Systems and Networks (SSN 2009). 2009.
- IEEE Infocom 2008, 2009, 2010, 2011, 2012
- The First IEEE Int. Workshop on Info. and Data Assurance (IPCCC WIDA'08). 2008
- International Workshop on Wireless and Sensor Networks (WSNS 2008)
- The First International Workshop on Wireless Security and Privacy (WiSP 2008)
- Fourth International Workshop on Systems and Networks (SSN 2008)
- IEEE Wireless Communications and Networking Conference (WCNC 2007).
- Third International Workshop on Systems and Networks (SSN 2007)
- Third ACIS Intl. Workshop on Self-Assembling Wireless Networks (SAWN 2007)
- Third International Workshop on Wireless and Sensor Networks (WSNS 2007)

# Most important publications and presentations from the past five years:

- Bo Li, Cem Boyaci and Ye Xia. A Refined Performance Characterization of Longest-Queue-First Policy in Wireless Networks. IEEEE Transactions on Networking. Accepted.
- YoungSang Yun and Ye Xia. Maximizing the Lifetime of Wireless Sensor Networks with Mobile Sink in Delay-Tolerant Applications. IEEE Transactions on Mobile Computing, vol. 9, no. 9, Sept. 2010, pp. 1308-1318.
- Xiaoying Zheng, Chunglae Cho and Ye Xia. Optimal Swarming for Massive Content Distribution. IEEE Transactions on Parallel and Distributed Systems, , vol. 21, no. 6, June 2010, pp 841-856.
- Kannan Rajah, Sanjay Ranka and Ye Xia. Advance Reservation and Scheduling for Bulk Transfers in Research Networks. IEEE Transactions on Parallel and Distributed Systems, vol. 20, issue 11, Nov. 2009, pp. 1682 1697.
- Xiaoying Zheng, Feng Chen, Ye Xia and and Yuguang Fang. A Class of Cross-Layer

Optimization Algorithms for Performance and Complexity Trade-offs in Wireless Networks. IEEE Transactions on Parallel and Distributed Systems, vol. 20, issue 10, Oct. 2009, pp. 1393 – 1407.

- Seung Chul Han and Ye Xia. Optimal Node Selection Algorithm for Parallel Access in Overlay Networks. Computer Networks, vol. 53, issue 9, June 2009, pp. 1480-1496.
- Ye Xia, Shigang Chen, Chunglae Cho and Vivekanand Korgaonkar. Algorithms and Performance of Load Balancing with Multiple Hash Functions in Massive Content Distribution. Computer Networks, vol. 53, issue 1, January 2009. Pages 110-125.
- Ye Xia. A Refinement of the Jensen's Inequality for a Class of Increasing and Concave Functions. Journal of Inequalities and Applications. Volume 2008, July 2008.
- Seung Chul Han and Ye Xia. Network Load-Aware Content Distribution in Overlay Networks. Computer Communications. vol. 53, issue 1, January 2009. Pages 51-61.
- Ye Xia. Two Refinements of the Chernoff Bound for the Sum of Non-identical Bernoulli Random Variables. Statistics and Probability Letters. Vol. 78, 2008. Page 1557-1559.
- Kannan Rajah, Sanjay Ranka and Ye Xia. Scheduling Bulk File Transfer with Start and End Times. Computer Networks. vol 52, issue 5, April, 2008. Page 1105-1122.
- Ye Xia and David Tse. On the Large Deviations of Resequencing Queue Size: 2-M/M/1 Case. IEEE Transactions on Information Theory, vol. 54, no. 9, September 2008. Page 4107-4118.

Most recent professional development activities: see service activities above

# Name: TUBA YAVUZ-KAHVECI

Education: Ph.D., Computer Science, University of California, Santa Barbara Summer 2004

## Academic experience:

• Lecturer, Dept of Computer and Info. Science and Eng, Univ Florida, 2004 to date.

## Non-academic experience:

• Summer Internship, Texas Instruments, Santa Barbara, Summer 2001.

## Certifications or professional registrations: none

## Current membership in professional organizations: none

## Honors and awards:

- NSF Educators Travel Grant
- Microsoft Travel Grant

## Service activities:

- Referee for IEEE Transactions of Software Engineering, Automated Software Engineering, Software Tools for Technology Transfer (STTT) journals.
- Program Committee Member for ICSOFT.

# Most important publications and presentations from the past five years:

- KyungHee Kim, Tuba Yavuz-Kahveci, and Beverly Sanders. "JRF-E: Using Model Checking to give Advice on Eliminating Memory Model-related Bugs". Accepted for publication in the Proceedings of 25th IEEE/ACM International conference on Automated Software Engineering (ASE 2010), Antwerp, Belgium, 20-24 September 2010.
- KyungHee Kim, Tuba Yavuz-Kahveci, and Beverly Sanders. "Precise Data Race detection in Relaxed Memory Model using Heuristic based Model Checking". Proceedings of 24th IEEE/ACM International conference on Automated Software Engineering (ASE 2009), Auckland, New Zealand, 16th-20th November 2009.
- Tuba Yavuz Kahveci and Tevfik Bultan. "Action Language Verifier: An Infinite State Model Checker for Reactive Software Specifications." Accepted for publication in the Formal Methods in System Design.

Most recent professional development activities: see service activities above

## Name: RONG ZHANG

Education: Ph.D, Computer Science, Rutgers - the State University of New Jersey, 2006

## Academic experience:

• Lecturer, Dept of Computer and Info. Science and Eng, Univ Florida, 2006 to date.

## Non-academic experience: none

## Certifications or professional registrations: none

## Current membership in professional organizations: none

#### Honors and awards:

## Service activities:

- Assistant Undergraduate Coordinator in the Undergraduate Petitions Committee of CISE dept
- Commencement Representatives of CISE dept
- Student Exit Interview Coordinator of CISE dept

## Most important publications and presentations from the past five years:

## Most recent professional development activities:

# Appendix B2 – Faculty Vitae (ECE Faculty)

## 1. Name – **DAVID P. ARNOLD**

- 2. Education PhD, EE, Georgia Institute of Technology, 2004; MS, EE, University of Florida, 2001; BSEE, University of Florida, 1999; BSCEN, University of Florida, 1999
- Academic experience Electrical & Computer Engineering, University of Florida, Associate Professor, 2010-date, full time; Material Science & Engineering, University of Florida, 2010-date, courtesy appointment; Electrical & Computer Engineering, University of Florida, Assistant Professor, 2005-2010, full time
- 4. Non-academic experience None
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electrical & Electronic Engineers; Eta Kappa Nu; American Association of Engineering Educators
- Honors and awards DARPA Young Faculty Award; Presidential Early Career Award for Scientists and Engineers; Southeastern Center for Electrical Engineering Education Young Investigator Grant; ECE Student-Selected Teacher of the Year, Runner-Up; Best Paper, AIAA Aerodynamic Measurement Technical Committee; UF ECE Electric E Award
- 8. Service activities (within and outside of the institution) Advisor, HKN Student Chapter; Numerous conference program committees; Journal reviewer; Local Science Fair Judge; Volunteer, Make-A-Wish Foundation
- Briefly list the most important publications and presentations from the past five years C. D. Meyer, S. S. Bedair, B. C. Morgan, and D. P. Arnold, "High-inductance-density, air-core, power inductors and transformers designed for operation at 100-500 MHz," *IEEE Trans. Magn.*, vol. 46, no. 6, pp. 2236-2239, June 2010.

S. Shetye, I. Eskinazi, and D. P. Arnold, "Magnetic self-assembly of millimeter-scale components with angular orientation," *J. Microelectromech. Syst.*, vol. 19, no. 3, pp. 599-609, June 2010

S. Cheng and D. P. Arnold, "A study of a multi-pole magnetic generator for low-frequency vibrational energy harvesting," *J. Micromech. Microeng.*, vol. 20, no. 2, 025015, 10 pages, Feb. 2010.

D. P. Arnold and N. Wang, "Permanent magnets for MEMS," J. Microelectromech. Syst., vol. 18, no. 6, pp. 1255-1266, Dec. 2009.

J. S. Agashe and D. P. Arnold, "A study of scaling and geometry effects on the forces between cuboidal and cylindrical magnets using analytical force solutions," *J. Phys. D: Appl. Phys.*, vol. 41, no. 10, 105001, 9 pages, May 2008.

S. Cheng, N. Wang, and D. P. Arnold, "Modeling of magnetic vibrational energy harvesting systems using equivalent circuit representations," *J. Micromech. Microeng.*, vol. 17, no. 11, pp. 2328-2835, Nov. 2007.

D. P. Arnold, "Review of microscale magnetic power generation," *IEEE Trans. Magn.*, vol. 43, no. 11, pp. 3940-3951, Nov. 2007

10. Briefly list the most recent professional development activities – Short Course on "Electroplated Magnetic Films," Electrochemical Society Meeting, Oct. 2008

- 1. Name A. ANTONIO ARROYO
- Education PhD, EE, University of Florida, 1981; MS, EE, University of Florida, 1973; BSEE, EE, University of Florida, 1970
- Academic experience Department of Electrical Engineering, University of Florida, Associate Professor, 1985-date, full time; Department of Electrical Engineering, Auburn University, Assistant Professor, 1982-1985, full time; Department of Electrical Engineering, University of Florida, Visiting Professor, 1981-1982, full time; Department of Computer and Information Sciences, University of Florida, Adjunct Professor, 1977-1979, full and part-time.
- 4. Non-academic experience company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time Northeast Regional Data Center of the State of Florida, Gainesville, Florida, Computer Research Specialist, Development of Microfiche Systems Software for UF Med Center, 1978-1979, full time; Environmental Science and Engineering Inc., Department Head of Computer Applications/Statistics, Gainesville, Florida, 1969-1974; Consulting Engineer, The Crom Corporation, Gainesville, Florida, Computerized and reprogrammed The Crom Corporation, 1976-1995;
- 5. Certifications or professional registrations State of Florida Professional Engineer License #19957
- Current membership in professional organizations American Association for Artificial Intelligence (AAAI); American Society for Engineering Education (ASEE); Institute of Electrical and Electronic Engineers (IEEE); Association for Computing Machinery (ACM); Sigma Xi; Eta Kappa Nu (HKN); Sigma Tau Engineering Honorary Fraternity
- 7. Honors and awards Distinguished Military Graduate, US ARMY ROTC, UF 1971
- 8. Service activities (within and outside of the institution) SACS Evaluator: UT Austin 2008, Virginia Tech 2010, UDLA Mexico 2005-2009, ITESM Mexico 2009
- Briefly list the most important publications and presentations from the past five years "A knowledge-based consultant for human toxic exposures," J D Schipper, J L Schauben, D D Dankel II, A A Arroyo and D R Sollee, *Clinical Toxicology*, vol. 47, no. 5, pp. 465-466, Jun. 2009.

"Development of the NaviGATOR for the 2007 DARPA Urban Challenge," Carl Crane, David Armstrong, Antonio Arroyo, Antoin Baker, Doug Dankel, Greg Garcia, Nicholas Johnson, Jaesang Lee, Shannon Ridgeway, Eric Schwartz, Eric Thorn, Steve Velat, and Ji Hyun Yoon, *IEEE Transactions on Intelligent Transportation Systems*, Jan. 2009 (Invited Paper)  Briefly list the most recent professional development activities – *Cigr International Conference Of Agricultural Engineering*, Xxxvii Congresso Brasileiro De Engenharia Agrícola – Conbea 2008 Brazil, August 31 to September 4, 2008; *2008 Florida Conference on Recent Advances in Robotics*, FIT, Melbourne, Florida, May 8-9, 2008

#### 1. Name – RIZWAN BASHIRULLAH

- 2. Education PhD, EE, North Carolina State University, 2004; MS, EE, North Carolina State University, 1999; BSEE, University of Central Florida, 1997
- 3. Academic experience Electrical & Computer Engineering, University of Florida, Associate Professor, 2010-date, full time; Electrical & Computer Engineering, University of Florida, Assistant Professor, 2005-2010, full time
- Non-academic experience Chief Science Officer eTect LLC, Co-founder, Biomedical start-up developing innovative in-body communication technologies for medication adherence monitoring, part time; Post-doctoral Research Associate, Department of Electrical & Computer Eng., North Carolina State University, 2004, full time
- 5. Certifications or professional registrations None
- Current membership in professional organizations IEEE Biomedical Engineering Society, 2005-date; IEEE Solid State Circuits Society, 2004-date; Institute of Electrical and Electronics Engineers, 1999-date
- Honors and awards 2006 National Science Foundation Faculty Early Career Development Award; 2005 - Who's Who in Engineering Academia, National Honor Society; Member of Golden Key and Phi Kappa Phi, National Honor Society; Best Session Paper Award: (J. Chen, R. Bashirullah, "A 50mW 2.5GS/s 5-Bit ADC in 0.13µm CMOS with a Novel Background Calibration Scheme," Techcon, Sept 10, 2010); Inventor Recognition Award, University of Florida 03/2010; The Museum of Modern Art, New York (MoMA) exhibition, Swallow-Signaling Pill, 2011
- 8. Service activities (within and outside of the institution) Electronics Division Area Chair, 08/2010-date; Faculty Search Committee, 2009-date; ECE Graduate Admissions and Aid Committee, 2004-2009; ABET Departmental Committee, 2005-date; Associate Editor, Transactions of Biomedical Engineering, 2005-2009; Conference Co-Chair, IEEE Topical Conference on Biomedical Wireless Technologies, Networks & Sensing Systems (BioWireleSS), Jan 2011; Technical Program Committee Member, IEEE International Symposium on Low Power Electronic and Design (ISLPED) - mixed-signal track, 2010; Organizing Session Track Chair, Biomedical Applications of Microwave Systems, IEEE Radio and Wireless Symposium, 2010; Technical Program Committee Member, IEEE International Symposium on Quality Electronic Design, Package - IC Interaction & Co-Design (PDI), 2009; Technical Program Committee Member, IEEE International Symposium on Low Power Electronic and Design (ISLPED) - mixed-signal track, 2009; Technical Program Committee Member, IEEE International Symposium on Quality Electronic Design, Package - IC Interaction & Co-Design (PDI), 2008; Technical Program Committee Member, IEEE International Symposium on Circuits and Systems (ISCAS) 2008; Technical Program Committee Member, IEEE International Symposium on Circuits and Systems - Biomedical Signal & Image Processing, 2007; Technical Program Committee Member, IEEE International Symposium on Quality Electronic

Design, Package - IC Interaction & Co-Design (PDI), 2007; Journal Reviewer for: Journal of Solid State Circuits, 2008-date; Transactions on Biomedical Circuits and Systems, 2008-date; Transactions on Circuits and Systems I, 2006-date; Transactions on Circuits and Systems II, 2006- present; Transactions on Very Large Integrated Circuits, 2004-date; Transactions on Biomedical Engineering, 2005-date; Antenna and Wireless Propagation Letters, 2004-date; Transactions on Microwave Theory and Techniques, 2008-date; IEE Electronics Letters, 2006-date; Reviewer for National Science Foundation: Reviewer for NSF Career Panel, 2007, 2008; Reviewer for Oak Ridge Associated Universities: ORAU Ralph Powe Junior Faculty Enhancement Award in the Engineering/Applied Sciences, 2006

 Briefly list the most important publications and presentations from the past five years – R. Bashirullah, "Wireless Biomedical Implants," *IEEE Microwave Magazine*, Dec 2010

J. Chen, R. Bashirullah, "A 50mW 2.5GS/s 5-Bit ADC in 0.13µm CMOS with a Novel Background Calibration Scheme," *Techcon*, Sept 10, 2010. (Best Session Paper Award)

Z. Xiao, C-M Tang, C. Dougherty, R. Bashirullah, "A 20uW Neural Recording Tag with Supply-Current-Modulated AFE in 0.13um CMOS," *IEEE International Solid State Circuits Conference* (ISSCC), San Francisco, CA, pp. 122-123, Feb 2010

P. Li, L. Xue, D. Bhatia, R. Bashirullah, "Digitally Assisted Discontinuous Conduction Mode 5V/100MHz and 10V/45MHz DC-DC Boost Converters with Integrated Schottky Diodes in Standard 0.13um CMOS," *IEEE International Solid State Circuits Conference* (ISSCC), San Francisco, CA, pp. 206-207, Feb 2010

P. Li, L. Xue, P. Hazucha, T. Karnik, R. Bashirullah, "A Delay Locked Loop Synchronization Scheme for High Frequency Multiphase Hysteretic dc-dc Converters," *IEEE Journal of Solid State Circuits*, Vol. 44, No. 11, pp. 3131-3145, Nov. 2009

H. Yu, C-M Tang and R. Bashirullah, "Asymmetric RF tags for Ingestible Medication Compliance Capsules," *IEEE VLSI Circuits Symposium*, Japan, pp. 34-35, June 2009

Z. Xiao, C-M Tang, C-C Peng, H. Yu and R. Bashirullah, "A 190µW-915MHz Active Neural Transponder with 4-channel Time Multiplexed AFE," *IEEE VLSI Circuits Symposium*, Japan, pp. 58-59, June 2009

P. Li, R. Bashirullah, "A Wireless Power Interface for Rechargeable Battery Operated Medical Implants," *IEEE Trans. Circuits and Systems II*, vol. 54, no.10, pp. 912-916, Oct. 2007

10. Briefly list the most recent professional development activities – Attended various conferences and symposiums

## 1. Name – GIJS BOSMAN

- 2. Education PhD, Physics, University of Utrecht, 1981; MS, Physics, University of Utrecht, 1976; BS, Physics, University of Utrecht, 1971
- Academic experience Professor and Graduate Coordinator, Electrical and Computer Engineering, University of Florida, 2005-date, full time; Professor, Electrical and Computer Engineering Department, University of Florida, 2003-2005, full time; Professor and Associate Chair for Student Affairs, Electrical and Computer Engineering Department, University of Florida, 1997-2003, full time; Professor and Graduate Coordinator, Electrical and Computer Engineering, University of Florida, 1990-1997, full time; Associate Professor, Electrical Engineering Department, University of Florida, 1986-1990, full time; Assistant Professor, Electrical Engineering Department, University of Florida, 1984-1986, full time; Visiting Assistant Professor, Electrical Engineering Department, University of Florida, 1981-1984, full time
- 4. Non-academic experience None
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electrical & Electronic Engineers, American Physical Society, Dutch Physical Society
- Honors and awards 2006-Eta Kappa Nu, ECE Teacher of the Year; 1999-College of Engineering Teacher of the Year Award for 1998-1999; 1998 - University of Florida TIP Award for Outstanding Teaching; 1994-University of Florida TIP Award for Outstanding Teaching; 1994-Departmental Award for Outstanding Teacher of an EE Core Course; 1989-Departmental Award for Supervising the Outstanding Ph.D. Dissertation of 1988; 1987-Departmental Award for Supervising the Outstanding Ph.D. Dissertation of 1986; 1986-Departmental Award for Outstanding Teacher of an EE Core Course; 1985-Departmental Award for Supervising the Outstanding Ph.D. Dissertation of 1985; 1986-Departmental Award for Supervising the Outstanding Ph.D. Dissertation of 1985; 1986-Departmental Award for Supervising the Outstanding Ph.D. Dissertation of 1985; 1984-Tau Beta Pi Award for Excellence in Undergraduate Teaching
- 8. Service activities (within and outside of the institution) Member of the Senate (1993-2000 and 2009-date); Served as chair and member of the following departmental committees; Device Division, ECE Curriculum Committee, Graduate Committee, Faculty Development Committee, Device and Physical Electronics Area Committee, Peer Review Committee, Faculty Search Committees; Member of the Scientific Organizing Committee of the Unsolved Problems of Noise (UPON) V Conference held in Lyon, France in June 2008; Member of the Scientific Organizing Committee of the Nineteenth International Conference on Noise and Fluctuations to be held in Tokyo, Japan, September 2007; Member of the Scientific Organizing Committee of the Eigtheenth International Conference on Noise and Fluctuations held in Salamanca, Spain, September 2005; Leading opponent at the Ph.D. Exam of Jay S. Kolhatkar at the Technical University of Twente, The Netherlands, 2005; Member of the Scientific Organizing Committee of the Unsolved Problems of Noise (UPON) IV Conference held in Lecce, Italy in June 2005;

Member of the Scientific Organizing Committee of Optics East, Boston 2005; State and County Science Fair Judge (2005, 2004, 2003, and 2002); Reviewer for all major journals in the field of Applied and Device Physics; Reviewer of proposals for all major funding agencies

 Briefly list the most important publications and presentations from the past five years – "Device reliability study of high gate electric field effects in AlGaN/GaN high electron mobility transistors using low frequency noise spectroscopy," Hemant Rao and Gijs Bosman, J. Appl. Phys. Vol. 108, 053707 (2010)

"Transport properties of single-walled carbon nanotube transistors after gamma radiation treatment," S.A. Vitusevich, V. A. Sydoruk, M. V. Petrychuk, B. A. Danilchenko, N. Klein, A. Offenhausser, A. Ural, and G. Bosman, *J. Appl. Phys.* Vol. 107, 063701 (2010).

"Temperature-dependent transport and 1/f noise mechanisms in single-walled carbon nanotube films," Ashkan Behnam, Amlan Biswas, Gijs Bosman, and Ant Ural, *Phys. Rev. B* 81, 125407 (2010).

"Simultaneous low-frequency noise characterization of gate and drain currents in AlGaN/GaN high electron mobility transistors," Hemant Rao and Gijs Bosman, *J. Appl. Phys.* Vol. 106, 103712 (2009).

"Effect of mechanical strain on 1/f noise in metal-oxide semiconductor field-effect transistors," Lim Ji-Song; Acosta Antonio; Thompson Scott E.; Bosman Gijs; Simoen Eddy; Nishida Toshikazu, *Journal of Applied Physics*;105(5):054504 - 054504-11 (2009).

"Percolation scaling of 1/f noise in single-walled carbon nanotube films," by Ashkan Behnam, Gijs Bosman, and Ant Ural, *Physical Review* B 78, 085431 (2008).

10. Briefly list the most recent professional development activities – Attended annual International Conference on Noise and Fluctuations

- 1. Name WILLIAM R. EISENSTADT
- Education PhD, EE, Stanford University, 1986; MS, EE, Stanford University, 1981; BSEE, EE, Stanford University, 1979
- Academic experience Electrical & Computer Engineering, University of Florida, Professor, 2007- present, full time; Electrical & Computer Engineering, University of Florida, Associate Professor, 1990-2007, full time; Electrical & Computer Engineering, University of Florida, Assistant Professor, 1986-1990, full time; Electrical & Computer Engineering, University of Florida, Provisional Assistant Professor, 1983-1986, full time
- Non-academic experience Engineering Aide, Hewlett-Packard Research Labs, Evaluated the TECAP measurement system for the characterization of GHz bipolar transistors, Summer 1979, full time; Engineering Aide, NASA Ames Research Center, Analog circuit design, Summer 1978, full time
- 5. Certifications or professional registrations None
- Current membership in professional organizations Automatic RF Test Group, ARFTG; IEEE Senior Member; Round Table Group; Semiconductor Test Consortium, STC; Technology Test Technical Council, TTTC
- Honors and awards 2009-Three SRC Inventor Recognition Awards; 2005 SRC Inventor Recognition Award; 1996-AT&T Paradyne Spot Light Award
- 8. Service activities (within and outside of the institution) College of Engineering Tenure and Promotion Committee Member, 2010-2011; Department of Electrical Engineering, Faculty Search Committee, Chair, 2010/2011; College of Engineering Sabbatical/Professional Development Committee, member 2009-2010; Department of Electrical and Computer Engineering, Faculty Search Committee, member 2009-2010; Department of Electrical and Computer Engineering, Ph.D. Examination Committee, 2008-2010; Department of Electrical and Computer Engineering, Head of Electronics Research Division, 2004-2008; University of Florida Faculty Senate: member 1987-1989, 2001-2005; University of Florida Task Force on Information Technology: member 1990-1991; College of Engineering Bylaws Committee: member 2005; College of Engineering Computer Resources Committee: member 1989-1992; College of Engineering Manufacturing Systems Engineering Systems Program: member, 1989; Department of Electrical and Computer Engineering, 2009/2010 Faculty Search Committee; Department of Electrical and Computer Engineering, Ph.D. Examination Committee, 2008-2010; Presented, "Electrical and Electronic Circuits," A 60 minute lecture and laboratory at William S. Talbot Elementary School, to 4th grade class of Ms. Thomas, March 24, 2009; Technical Program Co-Chair, 9h Workshop on Test of Wireless Circuits and Systems," Santa Cruz, CA, April 21-22, 2010; Program Co-Chair, 3rd IEEE International GHz/Gbps Test Workshop (GTW'07), Póvoa de Varzim, Portugal, June 18-20, 2007; Technical Program Co-Chair, "4th Workshop on Test of Wireless Circuits and Systems," Cannes "Cote d' Azure," France, June 29-30, 2005; International Test Conference

Technical Paper Reviewer, ITC 2003, ITCS 2004, ITC 2005, ITC 2006, ITC 2007, and ITC 2008; VLSI Test Symposium reviewer, 2003, 2004, 2005, 2006; Registered as a peer reviewer for the Qatar National Research Fund; NSF Review Panel for panel to review unsolicited proposals in the Communications, Circuits, and Sensing-Systems (CCSS) of the ECS Division, Arlington, VA, Feb 3-4, 2011; NSF Review Panel for Small Scale Team Proposals: MEMS Sensors and Sensing Networks, Arlington, VA, May 23-24 2005; IEEE Vehicular Technology Society, Daniel E. Nobel Fellowship Award Selection Committee, 1994-2005

 Briefly list the most important publications and presentations from the past five years – "Software Defined Match Conrol Circuit Integrated with a Planar Inverted F Antenna," H.-H. Yeh, K. L. Melde, Z. Zhou, and W. R. Eisenstadt, accepted by IEEE Trans. on Ant. and Prop. June 26, 2010.Q. Yin, W. Eisenstadt and T. Xia," "Wireless System for Microwave Test Signal Generation," *Design and Test of RF IC Chips, IEEE Design & Test of Computers*, pp. 160-166, vol. 25, no. 2, March-April 2008

"Design of Multigigabit-per-Second Transceiver for Band-Limited High-Speed Data Communication Using DC-Free Signaling,"H. Yeo, J. Chen, R. Bashirullah, W. R. Eisenstadt, and J. Lin, *IEEE Micro. Theory and Tech*, vol. 56, No. 7, pp. 1555 – 1564, July 2008.

"In-Situ Characterization of High-Speed I/O Chip-Package Systems," J. Ahn, S. Pulingundla, R Bashrullah, R. M. Fox, and W. R. Eisenstadt, EPEP 2007, Atlanta, Georgia, October 29-31, 2007, pp. 311-314.

W. R. Eisenstadt, B. Stengel, and B. Thompson, *Microwave Differential Circuit Design Using Mixed-Mode S-Parameters*, ISBN 1-58053-933-5, Artech House, Norwood, MA, April 2006, 242 pages and CD ROM. See <u>www.artechhouse.com</u>.

 Briefly list the most recent professional development activities – NSF SBIR Phase I Workshop, Arlington VA. September 20-22, 2010; annual IEEE Wireless and Microwave Technology (WAMI) Conference; IEEE International Symposium on Circuits and Systems; Workshop on Test of Wireless Circuits and Systems

- 1. Name YUGUANG "MICHAEL" FANG
- 2. Education PhD, EECS, Boston University, 1997; PhD, EECS, Case Western Reserve University, 1994; MS/BS, Math, Qufu Normal University, 1987
- Academic experience Electrical & Computer Engineering, University of Florida, Professor, 2005-date, full time; Electrical & Computer Engineering, University of Florida, Associate Professor, 2003-2005, full time; Electrical & Computer Engineering, University of Florida, Assistant Professor, 2000-2003, full time; Electrical & Computer Engineering, New Jersey Institute of Technology, Assistant Professor, 1998-2000, full time; Teaching and Research Faculty, Department of Mathematics & The Institute of Automation, Qufu Normal University, Shandong, PRC, 1987–1988, full time
- 4. Non-academic experience None
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electrical and Electronic Engineers Fellow; Association of Computing Machinery
- Honors and awards 2011 UF Distinguished Faculty; 2009-College of Engineering Faculty Mentoring Award; 2008-IEEE Fellow-"For contributions to wireless networks and mobile computing systems"; 2006 - University of Florida Research Foundation Professor; 2002-Office of Naval Research Young Investigator Award; 2002-IEEE TCGN Best Paper Award; 2001-National Science Foundation Faculty Early Career Development Award; 2001-Chinese Association for Science & Technology Academic Excellence Award; 2000-IEEE Appreciation Award
- 8. Service activities (within and outside of the institution) Faculty Development Committee, Department of Electrical and Computer Engineering, University of Florida, August 2007–Present; Advisory Committee for the Department Chair, Department of Electrical and Computer Engineering, University of Florida, August 2003–2009; College of Engineering Tenure and Promotion Board, Fall 2005-Summer 2008; Graduate Admission and Aid Committee, Department of Electrical and Computer Engineering, University of Florida, Fall 2003–Spring 2007; Faculty Search Committee, Department of Electrical and Computer Engineering, University of Florida, 2001–2004; Editor-in-Chief, IEEE Wireless Communications, January 2009-present; Editor for Wireless Networks, IEEE Transactions on Communications, May 2000-present; Editor for ACM Wireless Networks (WINET), April 2001-present; Editor for Journal of Computer Science and Technology (JCST), November 2006–Present; Member of Steering Committee, IEEE Transactions on Mobile Computing, January 2008–present; Advisory Board, Journal of Communications (JCM), Academy Publisher, Oulu, Finland, November 2008-date; Served on the Faculty Search Committee, Department of Electrical and Computer Engineering at New Jersey Institute of Technology, 1998–2000

 Briefly list the most important publications and presentations from the past five years – "C4: a new paradigm for providing incentives in multi-hop wireless networks," C. Zhang, X. Zhu, Y. Song and Y. Fang, *IEEE INFOCOM'11*, Shanghai, China, 10-15 April, 2011

"MABS: multicast authentication based on batch signature,"Y. Zhou, X. Zhu and Y. Fang, *IEEE Transactions on Mobile Computing*, vol.9, no.7, pp.982-993, July 2010

"Available bandwidth in multirate and multihop wireless ad hoc networks," F. Chen, H. Zhai and Y. Fang *IEEE Journal on Selected Areas in Communications*, vol.28, no.3, pp.299-307, April 2010

"Toward a formalization for trust-based routing in wireless ad hoc networks," C. Zhang, X. Zhu, Y. Song and Y. Fang, *IEEE INFOCOM'10*, San Diego, California, USA, March 15-19, 2010

"A privacy-preserving scheme for online social networks with efficient revocation," J. Sun, X. Zhu and Y. Fang, *IEEE INFOCOM'10*, San Diego, California, USA, March 15-19, 2010.

"Asymptotic connectivity in wireless ad hoc networks using directional antenna," P. Li, C. Zhang and Y. Fang, *IEEE/ACM Transactions on Networking*, vol.17, no.4, pp.1106-1117, August 2009

 Briefly list the most recent professional development activities – Attended IEEE International Conference on Computer Communications annually, IEEE International Symposium on Personal, Indoor & Mobile Radio Communications, International Conference on Quality of Service in Heterogeneous Wired/Wireless Networks.

## 1. Name – **RENATO FIGUEIREDO**

- 2. Education PhD, CEN, Purdue University, 2001; MS, EE, University of Campinas, 1995; BSEE, University of Campinas, 1994
- Academic experience Electrical & Computer Engineering, University of Florida, Associate Professor, 2008-date, full time; Electrical & Computer Engineering, University of Florida, Assistant Professor, 2002-2008, full time; Electrical & Computer Engineering, Northwestern University, Assistant Professor, 2001-2002, full time
- 4. Non-academic experience Research Intern, R&D Center, Telecomm. of Brazil São Paulo, Brazil, 1993–1994
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electrical and Electronics Engineers; Association for Computing Machinery
- Honors and awards 2008-Best paper award at IEEE International Symposium on High Performance Distributed Computing (HPDC 2008); 2008-Best paper award at WETICE Workshops on Enabling Technologies: Infrastructure for Collaborative Enterprises– Collaborative Peer-to-Peer Systems (COPS 2008)
- 8. Service activities (within and outside of the institution) 2009-Computer Engineering Research Division chair; Spring 2005-Faculty Search Committee, Fall 2004-Computer Engineering Search Committee, Fall 2003-Curriculum Committee, Spring 2004, Fall 2005, Spring 2006, Spring 2007, Spring 2008-Graduate Aid Committee; Associate Editor, IEEE Transactions on Computers, April 2010-date; Cluster Computing Journal, April 2009-date; Technical Program Committee Chair, International Conference on Autonomic Computing (ICAC 2010); Technical Program Committee Chair, Workshop on Virtualization Technology in Distributed Computing (VTDC 2009); Technical Program Committee Member of various IEEE/ACM-sponsored international conferences: High Performance Distributed Computing (HPDC-2011, 2009, 2008, 2007, 2006), ICAC (2010, 2009), SuperComputing (SC-2009), Cluster Computing and the Grid (CCGrid-2011), Cluster Computing (2007).
- Briefly list the most important publications and presentations from the past five years "SocialVPN: Enabling Wide-Area Collaboration with Integrated Social and Overlay Networks", Pierre St. Juste, David Wolinsky, P. O. Boykin, R. Figueiredo, *Computer Networks Journal*, 2010

"A Simulation Framework for the Analysis of TLB Behavior in Virtualized Environments," G. Venkatasubramanian, R. Figueiredo, R. Illikkal, D. Newell, 18th IEEE International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS), 2010

"On the Design of Scalable, Self-Configuring Virtual Networks," D.Wolinsky, Y. Liu, G. Venkatasubramanian, P. St Juste, R. Figueiredo, Proceedings of SuperComputing 2009.

"TMT - A TLB Tag Management Framework for Virtualized Platforms," Girish Venkatasubramanian, Ramesh Illikal, Donald Newell, Renato Figueiredo Proceedings of SBAC-PAD 21st International Symposium on Computer Architecture and High Performance Computing, 2009

"Social VPNs: Integrating Overlay and Social Networks for Seamless P2P Networking", R. Figueiredo, P. O. Boykin, P. St Juste, D. Wolinsky, Proceedings of IEEE WETICE COPS (Collaborative Peer-to-peer Systems), 2008.

"Improving peer-connectivity in Wide-area Overlays of Virtual Workstations,"A. Ganguly, D. Wolinsky, P. O. Boykin, R. Figueiredo, Proceedings of International Symposium on High Performance Distributed Computing (HPDC), 2008.

"Learning-aided Predictor Integration for System Performance Prediction," J. Zhang and R. Figueiredo, Cluster Computing, pp. 425-442, October 2007

10. Briefly list the most recent professional development activities – Attendance and presentation in recent international conferences: 7<sup>th</sup> IEEE International Conference on Autonomic Computing (June 2010), 19<sup>th</sup> ACM International Symposium on High-Performance Distributed Computing (June 2010), 23<sup>rd</sup> IEEE/ACM International Conference for High Performance Computing, Networking, Storage and Analysis (November 2010).

- 1. Name JOSE A. B. FORTES
- 2. Education PhD, EE, University of Southern California, 1984; MS, EE, Colorado State University, 1981; BSEE, Universidade de Angola, 1978
- Academic experience Electrical & Computer Engineering, University of Florida, Professor and BellSouth Eminent Scholar, 2001-date, full time; Electrical & Computer Engineering, Purdue University, Professor and Assistant Head for Education, 1999-2001, full time; Electrical & Computer Engineering, Professor, 1995-1999, Purdue University, full time; Arquitectura de Computadors, Universitat Politecnica de Catalunya, Visiting Professor, 1993-1995, full time; Electrical Engineering, Purdue University, Associate Professor, 1989-1993, full time; Electrical Engineering, Purdue University, Assistant Professor, 1987-1989, full time; Electrical Engineering, Purdue University, Visiting Assistant Professor, 1984-1987, full time
- 4. Non-academic experience Battelle, Consulting on processor array programming, Research Triangle Park, North Carolina, 1988, full time; RCA, Advanced Technology Laboratories, Consulting on processor array design, New Jersey, 1985, full time
- 5. Certifications or professional registrations None
- Current membership in professional organizations International Electrical and Electronics Engineers; Association for Computing Machinery; American Association for the Advancement of Science: American Association for Artificial Intelligence: Digital Government Society of North America
- 7. Honors and awards 1999-IEEE Fellow; 1991-1995 IEEE Computer Society Distinguished Visitor; 1979 Rotary Foundation Fellowship
- 8. Service activities (within and outside of the institution) 2006–present, High Performance Computing Committee Member, Department of Electrical and Computer Engineering at the University of Florida; 2008–Present Member of the Editorial Board: Book series on Autonomic Systems, Birkhauser Publishing; 2004-PresentMember of the Editorial Board: ACM Journal on Emerging Technologies in Computer Systems; 1998-Present Member of Editorial Board: Cluster Computing: The Journal of Networks, Software Tools and Applications; 1993-Present Member of Editorial Board: International Journal of Parallel Programming; 1990-Present Member of Editorial Board: Journal of VLSI Signal Processing
- 9. Briefly list the most important publications and presentations from the past five years "Reliability evaluation of logic circuits using probabilistic gate models," Jie Han , Hao Chen, Erin Boykin, J. A. B. Fortes, *Microelectronics Reliability*. September 2010

"Architecting Reliable Multi-core Network-on-Chip for Small Scale Processing Technology," X. Fu, T. Li, J. A. B. Fortes, The 40th Annual IEEE/IFIP International Conference on Dependable Systems and Networks "Self-Caring IT Systems – A Proof-of-Concept Implementation in Virtualized Environments", S. Kadirvel, J. A.B. Fortes, 2nd IEEE International Conference on Cloud Computing Technology and Science (CloudCom), Indianapolis, USA, November 2010.

'User-level Virtual Networking Mechanisms to Support Virtual Machine Migration Over Multiple Clouds', M. Tsugawa, P. Riteau, A. Matsunaga, J. Fortes, IEEE International Workshop on Management of Emerging Networks and Services (IEEE MENS 2010), Miami, USA, December 2010.

"Decoupling Quality of Service, Resource Management and Connectivity in Clouds and Data Centers," The 8th International Symposium on Parallel and Distributed Computing (ISPDC '09), Lisbon, Portugal, July 1-3, 2009

"Sky Computing", K. Keahey, M. Tsugawa, A. Matsunaga, J. A. B. Fortes, *IEEE Internet Computing*, Volume: 13, Issue: 5, On page(s): 43-51, 2009.

"Co-adaptive Brain-Machine Interface via Reinforcement Learning," J. DiGiovanna, B. Mahmoudi, J. A. B. Fortes, J. C. Principe, and J. C. Sanchez, *IEEE Transactions on Biomedical Engineering*, Volume 56, Issue 1, pages 54-64, 2009

 Briefly list the most recent professional development activities – Attended several conferences and workshops each year including Super Computing 2005–2010, Cloudcom 2010, ICAC 2010; IEEE International Workshop on Management of Emerging Networks and Services; 11th International Symposium on Stabilization, Safety, and Security of Distributed Systems, 2009; International Conf. on Collaborative Computing: Networking, Applications and Worksharing, Washington DC, Nov 2009; IEEE International Conference on e-Science, Oxford, UK, 2009; IEEE Conference on Nanotechnology.
# 1. Name – **ROBERT M. FOX**

- 2. Education PhD, EE, Auburn University, 1986; MS, EE, Auburn University, 1981; BS, Physics, University of Notre Dame, 1972
- Academic experience Electrical & Computer Engineering, University of Florida, Associate Chair and Associate Professor, 2003-date, full time; Electrical & Computer Engineering, University of Florida, Associate Professor, 1992-2003, full time; Electrical & Computer Engineering, University of Florida, Assistant Professor, 1986-1992, full time
- 4. Non-academic experience Recording Engineer, Prestige Productions, Birmingham, Alabama, 1976-1979, full time
- 5. Certifications or professional registrations None
- Current membership in professional organizations Phi Kappa Phi, Eta Kappa Nu, Institute of Electrical & Electronic Engineers (Senior Member); Electron Devices Society; Circuits and Systems Society; Solid-State Circuits Society
- Honors and awards 2005-UF EDGE Outstanding Faculty Award; 2005-SRC Inventor Recognition Award; 1996-HKN Teacher Appreciation Award; 1995-UF Teaching Improvement Program (TIP) Award
- 8. Service activities (within and outside of the institution) UF Career Resource Center Advisory Committee Member; College of Engineering (COE) Distance Education Advisory Committee Member, COE Curriculum Committee Member; COE Honors and Awards Committee Member. ECE Dept. Curriculum Committee Member; ECE Petitions Committee Member; IEEE Bipolar/BiCMOS Circuits and Technology chairman 2002-2004, 2002 Short-Course Chairman; IEEE Journal of Solid-State Circuits, Guest Editor, September 2003; IEEE Circuits and Systems Society Chairman, 2001-2002; 2003 Analog Signal Processing Technical Committee Track Chair for the Intl. Symposium on Circuit and Systems
- Briefly list the most important publications and presentations from the past five years "Broadband active balun using combined cascode-cascade configuration," K. Jung, W. R. Eisenstadt, R. M. Fox, A. W. Ogden, and J.-Su. Yoon, *IEEE Microwave Theory and Techniques*, vol. 56, August 2008, pp. 1790-1796.

"A new characterization and calibration method for 3 dB-coupled on-wafer measurements," K. Jung, L. A. Hayden, O. D. Crisalle, W. R. Eisenstadt, R. M. Fox, P. Navratil, R. L. Campbell, C. McCuen, and M. Lewis," *IEEE Microwave Theory and Techniques*, vol. 56, May 2008, pp. 1193-1200.

"Marchand balun embedded probe," K. Jung, R. L. Campbell, P. Navratil, M. F. Andrews, C. McCuen, W. R. Eisenstadt, and R. M. Fox, *IEEE Microwave Theory and Techniques*, vol. 56, May 2008, pp. 1207-1214.

10. Briefly list the most recent professional development activities – Attended the Symposium on VLSI Circuits, 2008 and Symposium on VLSI Circuits, 2008

# 1. Name – ALAN D. GEORGE

- 2. Education PhD, CSC, Florida State University, 1991; MS, ECE, University of Central Florida, 1985; BS, CSC, University of Central Florida, 1982
- Academic experience Electrical & Computer Engineering, University of Florida, Professor, 2004-date, full time; Electrical & Computer Engineering, University of Florida, Associate Professor, 1997-2004, full time; Electrical Engineering, Florida A&M University-Florida State University, Associate Professor, 1993-1997, full time; Electrical Engineering, Florida A&M University-Florida State University, Assistant Professor, 1993-1997, full time; Electrical Engineering, Florida A&M University-Florida State University, Visiting Assistant Professor, 1987-1989, full time
- 4. Non-academic experience Task/Group Leader and Senior Computer Systems Engineer, Martin Marietta Missile and Electronics Systems, Orlando, Florida, responsible for technical development and administration of majority of all scientific superminicomputers, minicomputers, and workstations in entire plant, consisting of facilities servicing over 1000 engineers and technicians, responsible for the supervision of a staff of 20 engineers and operators, 1985-1987, full time; System Manager and Computer Systems Engineer, General Electric, Simulation and Control Systems Department, Daytona Beach, Florida, responsible for technical development and administration of all computers in Consolidated Engineering Computer Facility, consisting of facilities servicing over 400 engineers and technicians, 1983-1985, full time; Programmer/Analyst, University of Central Florida and Naval Training Systems Center, Orlando, Florida, Responsible for design, development, and generation of computer animation software for Computer Simulation Laboratory, and design and implementation of tracking and training software systems for Training Analysis and Evaluation Group, 1980-1983, part time
- 5. Certifications or professional registrations None
- Current membership in professional organizations Institute of Electrical and Electronic Engineers, Association of Computing Machinery, Society for Modeling & Simulation International (SCS)
- Honors and awards 2010-College Advising Award for Faculty Mentoring (UF); 2009-College Advising Award for Doctoral Student Mentoring (UF); 2005-University Service Award, OIT Volunteer of Year (UF); 1999-University Productivity Award (UF); 1995-State of Florida Teaching Incentive Program (TIP) Award (FAMU-FSU); 1994-Tau Beta Pi, Florida Eta Chapter, EE Professor of the Year Award (FAMU-FSU); 1993-University Teacher of the Year Award (FAMU-FSU)
- Service activities (within and outside of the institution) Chair, University High-Performance Computing Committee (2001-2009); Member, Faculty Search Committee, (1997-2004, 2006-2008); Member, ABET Course Curriculum Subcommittees, (2005-date); Member, Ph.D. Exam Committee, (2005-2007); Member, Graduate/Undergrad

Curriculum Committee, (2005-2006); Chair, Graduate/Undergrad Curriculum Committee, (2003-2005); served on editorial boards at three scholarly journals including *IEEE Transactions on Computers, Cluster Computing*, and *Microprocessors and Microsystems*. He has served as program chair, program co-chair, general chair, and general vice-chair at several IEEE conferences and workshops, keynote speaker at RSSI'07 and MRSC'08 conferences and HPRCTA workshop at SC'09, and on program committees at numerous other conferences

 Briefly list the most important publications and presentations from the past five years – "Characterization of Fixed and Reconfigurable Multi-Core Devices for Application Acceleration," J. Williams, A. George, J. Richardson, K. Gosrani, C. Massie, H. Lam, *ACM Transactions on Reconfigurable Technology and Systems (TRETS)*, Vol. 3, No. 4, Nov. 2010, pp. 19:1-19:29.

"A Simulation Framework for Rapid Analysis of Reconfigurable Computing Systems," C. Reardon, E. Grobelny, A. George, G. Wang, *ACM Transactions on Reconfigurable Technology and Systems (TRETS)*, Vol. 3, No. 4, Nov. 2010, pp. 25:1-25:29.

"Performance Analysis Framework for High-Level Language Applications in Reconfigurable Computing," J. Curreri, S. Koehler, A. George, B. Holland, R. Garcia, *ACM Transactions on Reconfigurable Technology and Systems (TRETS),* Vol. 3, No. 1, Jan. 2010, pp. 1-23.

"RAT: RC Amenability Test for Rapid Performance Prediction," B. Holland, K. Nagarajan, A. George, *ACM Transactions on Reconfigurable Technology and Systems (TRETS)*, Vol. 1, No. 4, Jan. 2009, pp: 22:1-22:31.

"Performance Analysis Challenges and Framework for High-Performance Reconfigurable Computing," S. Koehler, J. Curreri, A. George, *Parallel Computing* journal (special issue on reconfigurable computing), Vol. 34, No. 4, May 2008, pp. 217-230.

"Reformation and Formulation: Key Challenges for Reconfigurable Supercomputing," *Proc. of Many-core and Reconfig. Supercomputing Conf. (MRSC)*, Belfast, Ireland, Apr. 1-3, 2008.

 Briefly list the most recent professional development activities – Attended the Reconfigurable Architectures Workshop, 2010 and the High-Performance Reconfigurable Computing Technology and Applications Workshop, 2009

- 1. Name JAMES P. GOETTEN
- 2. Education MS, EE, University of Florida, 1993; BSEE, University of Florida, 1991
- 3. Academic experience Associate in Engineering, Electrical & Computer Engineering, University of Florida, 1997-date, full time;
- 4. Non-academic experience Senior Associate Engineer, International Business Machines Corporation, Burlington, Vermont, Developed and implemented software to test leading edge dynamic random access memory products prior to market release, 1996-1997, full time; Senior Associate Engineer, International Business Machines Corporation, Boca Raton, Florida, 1994-1996, full time; Foreman, Borelli Construction Co., Naples, Florida, Supervised and worked with crews performing all aspects of commercial building construction, 1982-1990, full time; Foreman, Community Electric Co., Naples, Florida, Supervised and scheduled electrical work for large commercial and condominium projects, 1979-1982 full time
- 5. Certifications or professional registrations State of Florida Registered Professional Engineer; State of Florida Licensed Electrician
- 6. Current membership in professional organizations Institute of Electrical and Electronics Engineers, National Fire Protection Association
- 7. Honors and awards None
- 8. Service activities (within and outside of the institution) None
- 9. Briefly list the most important publications and presentations from the past five years None
- 10. Briefly list the most recent professional development activities None

#### 1. Name – ANN GORDON-ROSS

- 2. Education PhD, CSE, University of California-Riverside, 2007; BS, CSE, University of California-Riverside, 2000
- Academic experience Electrical & Computer Engineering, University of Florida, Assistant Professor, 2007-date, full time; Department of Computer Science and Engineering, University of California at Riverside, Lecturer/Instructor, 2004-2006, part time
- 4. Non-academic experience None
- 5. Certifications or professional registrations None
- Current membership in professional organizations 2009-date, Women in Engineering ProActive Network; 2007-date Association of Computing Machinery; 2001-date Institute of Electrical and Electronic Engineers
- Honors and awards 2010 Best Paper award at the IARIA International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies (UBICOMM'10) for "A One-Shot Dynamic Optimization Methodology for Wireless Sensor Networks"; 2010 Best Paper award at the ACM Great Lakes Symposium on VLSI (GLSVLSI) for "Lightweight Runtime Control Flow Analysis for Adaptive Loop Caching"; 2010 CAREER award grant for "A Self-Tuning Cache Architecture for Multi-Core Systems"; 2008 IT Florida award recipient for "Excellence in Sustainability Through Information Technology"; 2000 Outstanding Student Commencement Award
- 8. Service activities (within and outside of the institution) Volunteer mentor 2008-date, University Minority Mentoring Program; Faculty Advisor, Phi Sigma Rho National Society for Women in Engineering and Engineering Technology 2008-date; Faculty Advisor, 2007-date, Women in Electrical and Computer Engineering; Technical Program Committee: ACM Conference on Languages, Compilers, and Tools for Embedded Systems 2011; IEEE Real-Time and Embedded Technology and Applications Symposium 2011; IEEE Symposium on Field-Programmable Custom Computing Machines 2010; IEEE International Symposium on High Performance Computer Architecture 2010; IEEE International Symposium on VLSI 2009–2010; IEEE/ACM International Conference on Compilers, Architecture, and Synthesis for Embedded Systems 2008–2010; IEEE/ACM International Conference on Hardware/Software Codesign and System Synthesis) 2008–2010; ACM Great Lakes Symposium on VLSI 2008–2010; IEEE Conference on Local Computer Networks 2008–2009; Session Chair: National Association for Multicultural Engineering Program Advocates (NAMEPA) and the Women in Engineering ProActive Network (WEPAN) Conference April 2010, IEEE Design Automation Conference 2010, IEEE/ACM International Conference on Compilers, Architecture, and Synthesis for Embedded Systems 2008, IEEE/ACM International Conference on Hardware/Software Codesign and System Synthesis 2008-

2009, ACM Great Lakes Symposium on VLSI 2008, and IEEE Computer Society Annual Symposium on VLSI (ISVLSI) April 2008

 Briefly list the most important publications and presentations from the past five years – "On the Interplay of Loop Caching, Code Compression, and Cache Configuration," M. Rawlins and A. Gordon-Ross, Asia and South Pacific Design Automation Conference, Jan 2011

"T-SPaCS - A Two-Level Single-Pass Cache Simulation Methodology," W. Zang and A. Gordon-Ross, Asia and South Pacific Design Automation Conference, Jan 2011

"A Lightweight Dynamic Optimization Methodology for Wireless Sensor Networks," A. Munir, A. Gordon-Ross, S. Lysecky, and R. Lysecky, IEEE International Conference on Wireless and Mobile Computing, Networking and Communications, October 2010

"A One-Shot Dynamic Optimization Methodology for Wireless Sensor Networks," A. Munir, A. Gordon-Ross, S. Lysecky, and R. Lysecky, IARIA International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies, Florence, Italy, October 2010. (Best Paper Award)

"DAPR: Design Automation for Partially Reconfigurable FPGAs," S. Yousuf and A.Gordon-Ross, The International Conference on Engineering of Reconfigurable Systems and Algorithms, July 2010

 Briefly list the most recent professional development activities – Attended various conferences and workshops including the National Association for Multicultural Engineering Program Advocates and the Women in Engineering ProActive Network Conference

- 1. Name **QUN 'JANE' GU**
- Education PhD, EE, University of California-Los Angeles, 2007; MS, ECE, University of Iowa, 2002; MS, EE, Huazhong University of Science & Technology, 2000; BS, EE, Huazhong University of Science & Technology, 1997
- 3. Academic experience –Electrical & Computer Engineering, University of Florida, Assistant Professor, 2010-date, full time; University of California, Los Angeles, Post-Doctoral Researcher, 2009-2010, full time
- 4. Non-academic experience Staff Design Engineer, AMCC, San Diego, CA, 2008-2009, full time, Develop 40Gbps ultra-high throughput and high-quality data communication systems over twisted wires; design wide bandwidth, low noise synthesizer for low jitter clock generation; Senior Design Engineer, Wionics Research, Realtek Group, Irvine, CA, 2007-2008, full time, Led the team to design a complete 60GHz transceiver front end with a full band synthesizer in 65nm CMOS technology. Invented several energy efficient circuit design techniques and created sophisticated design methodology for CMOS V-band link; System Verification Intern, SST Communication Inc., Los Angeles, CA, 2004, full time, WLAN 802.11 a/b/g transceiver/system testing and debugging; Circuit Design Intern, SST Communication Inc., Los Angeles, CA, 2003, full time, WLAN 802.11 a/b/g transceiver design and layout
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electrical and Electronic Engineers
- 7. Honors and awards None
- Service activities (within and outside of the institution) Serve as faculty searching committee member; Reviewer for various technical journals, including IEEE Journal of Solid-State Circuits, IEEE Microwave and Wireless Components Letters, IEEE Transactions on Circuits and Systems-I, IEEE Communications Magazine
- **9.** Briefly list the most important publications and presentations from the past five years "A Compact, Fully Differential D-band CMOS Amplifier in 65nm CMOS", Z. Xu, Q. J. Gu, I-N. Ku, M.-C. F. Chang, *IEEE Asian Solid-State Circuits Conference (ASSCC)*, Nov. 2010, Best Paper Award

"A 60 GHz High Gain Transformer-Coupled Differential Amplifier in CMOS," J. Y.-C. Liu, Q. J. Gu, T. LaRocca, N.-Y. Wang, Y.-C. Wu, and M.-C. F. Chang, *Asia-Pacific Microwave Conference (APMC)*, November 2010

"D-Band CMOS Transmitter and Receiver for Multi-Giga-Bit/sec Wireless Data Link," Z. Xu, Q. J. Gu, Y.-C. Wu, A. Tang and M.-C. Frank Chang, *IEEE Custom Integrated Circuits Conference (CICC)*, September 2010 "A 48GHz DiCAD-based VCO with 22.9% Tuning Range and FOMT of -186dBc/Hz, implemented in an Ultra-Wideband PLL," D. Murphy, Q. J. Gu, Y.-C. Wu, H.-Y. Jian, Z. Xu, F. Wang, M.-C. F. Chang, *IEEE European Solid-State Circuits Conference* (*ESSCIRC*), September 2010

"A Low Power V-Band CMOS Frequency Divider with Wide Locking Range and Accurate Quadrature Output Phases," Q. Gu, Z. Xu, D. Huang, T. LaRocca, N. Wang and M.-C. F. Chang, *IEEE Journal of Solid-State Circuits*, Apr. 2008.

"A Wide Locking Range and Low Power V-band Frequency Divider in 90nm CMOS," Q. Gu, Z. Xu and M.F. Chang, *IEEE Symposium on VLSI Circuits*, June 2007

 Briefly list the most recent professional development activities – Attended several conferences including: IEEE International Nanoelectronics Conference, Device Research Conference, International Symposium on Graphene Devices, International Workshop on Design and Test of Nano Devices, Circuits and Systems, International Conference Computer-aided Design

- 1. Name KARL GUGEL
- 2. Education PhD, ECE, University of Florida, 1993; MSE, EE, Florida Atlantic University, 1987; BSEE, Michigan Technological University, 1981
- 3. Academic experience –Electrical & Computer Engineering, University of Florida, Lecturer/Researcher, 2000-date, full time
- 4. Non-academic experience –Digital Control Lab, Gainesville, Florida, Consultant, 2000date, part time
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations None
- 7. Honors and awards 2010 IEEE ECE Teacher of the Year
- 8. Service activities (within and outside of the institution) Updated course EEL 4744-Microprocessor Applications and EEL 3923-Junior Design
- Briefly list the most important publications and presentations from the past five years "Optimizing Mill Control Through the Use of Vibration Analysis", Karl Gugel and Rodney Moon, IEEE-IAS/PCA Cement Industry Technical Conference, Charleston, South Carolina, April 2007

"Wireless, In Vivo Neural Recording using a Custom Integrated Bioamplifier and the Pico System," David Cheney, Aik Goh, Jie Xu, Karl Gugel, John G. Harris, Justin C. Sanchez, and Jose C. Principe, IEEE EMBS Conference on Neural Engineering, Kahala Coast, Hawaii, May 2007

10. Briefly list the most recent professional development activities – IEEE International Conference of the Engineering in Medicine and Biology Society, IEEE-IAS/PCA Cement Industry Technical Conference

- 1. Name **JING GUO**
- 2. Education PhD, EE, Purdue University, 2004; MS, EE, Shanghai Jiao Tong University, 2000; BSEE, Shanghai Jiao Tong University, 1998
- 3. Academic experience Electrical & Computer Engineering, University of Florida, Associate Professor, 2010-date, full time; Electrical & Computer Engineering, University of Florida, Assistant Professor, 2004-2010, full time
- 4. Non-academic experience None
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electrical & Electronic Engineers
- 7. Honors and awards NSF Faculty Early CAREER Award, 2009
- 8. Service activities (within and outside of the institution) COE Nanotechnology Strategic Plan Steering Committee, 2009; ECE Faculty Search Committee, 2010, ECE PhD Exam Committee, 2008-2010; Journal referee for Nature Nanotechnology, Nano Letters, Solid-State Electronics, IEEE Trans. Electron Devices, IEEE Electron Device Letters, IEE Proc. Circuits, Devices & Systems, Nanotechnology, Applied Physics Letters, Journal of Applied Physics, Chemical Physics Letters, Euro Physical Journal B, Journal of Vacuum Science and Technology, IEEE Trans. on Nanotechnology, Nanotechnology (IOP), IEEE Design and Test of Computers, Journal of Materials Science: Materials in Electronics), IEE Proc. Science, Measurement & Technology, IEE Proc. Circuits, Devices & Systems, Journal of Physical Chemistry, Semiconductor Science and Technology, Nano Research
- Briefly list the most important publications and presentations from the past five years "Local Strain in Tunneling Transistors Based on Graphene Nanoribbons," Y. Lu and J. Guo, *Appl. Phys. Lett.*, vol. 97, p. 073105, 2010

"Bandgap of Strained Graphene Nanoribbons," Y. Lu and J. Guo, *Nano Research*, vol. 3, p. 189, 2010

"Projected Performance Advantage of Multilayer Graphene Nanoribbons as a Transistor Channel Material,", Y. Ouyang, H. Dai, and J. Guo, *Nano Research*, vol. 3, p. 8 2010

"High Field Transport and Velocity Saturation in Graphene," J. Chauhan and J. Guo, *Appl Phys. Lett.*, vol. 95,023120, 2009

"Spin-Polarized Edge and Transport in Graphane Nanoscale Junctions," J. Guo and Y. Ouyang, *Appl Phys. Lett.*, vol. 94, 263107, 2009

"A Theoretical Study on Thermoelectric Properties of Graphene Nanoribbons," Y. Ouyang and J. Guo, *Appl Phys. Lett.*, vol. 94, 243104, 2009

"N-Doping of Graphene Through Electrothermal Reactions with Ammonia," X. Wang, X. Li, L. Zhang, Y. Yoon, P. Weber, H. Wang, J. Guo, and H. Dai, *Science*, vol. 324, p. 768, 2009

10. Briefly list the most recent professional development activities – Attended IEEE International Nanoelectronics Conference, Device Research Conference, French American Young Engineering Scientist Symposium, International Symposium on Graphene Devices, Intl. Workshop on Design and Test of Nano Devices, Circuits and Systems, Intl. Conference Computer-aided Design, US-Ireland Nanotechnology Workshop

### 1. Name – JACOB HAMMER

- Education DSc, EE, Technion-Israel Institute of Technology, 1980; MS, EE, Technion-Israel Institute of Technology, 1977; BSEE, Technion-Israel Institute of Technology, 1974
- Academic experience Electrical & Computer Engineering, University of Florida, Professor, 2004-date, full time; Electrical & Computer Engineering, University of Florida, Professor and Graduate Coordinator, 1997-2004, full time; Electrical & Computer Engineering, University of Florida, Professor, 1991-1997, full time; Electrical & Computer Engineering, University of Florida, Associate Professor, 1987-1991, full time; Mathematics and Statistics, Case Western Reserve University, Assistant Professor, 1982-1987, full time
- 4. Non-academic experience None
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Fellow, Institute of Electrical & Electronic Engineers
- 7. Honors and awards 1993-Men of Achievement, International Man of the Year; 1992-IEEE Fellow, "For contributions to nonlinear control and system theory"; IEEE Citation for Contributions to Nonlinear Control and System Theory; American Men and Women in Science; Who's Who in American Education; Who's Who in Science and Engineering; Dictionary of International Biography; Who's Who in the World
- 8. Service activities (within and outside of the institution) Director of Graduate Programs/Graduate Coordinator and Chairman of Graduate Studies Committee, Department of Electrical and Computer Engineering, University of Florida (August 1997-August 2005); Area Chairman for Systems and Control, Department of Electrical Engineering, University of Florida (January 1988-December 1989, 1996-2005); Member, Curriculum Committee, Department of Electrical Engineering, University of Florida, (1991-1993); Member, Graduate Committee, Department of Electrical Engineering, University of Florida (1988-1990, 1996 - 2005); Associate Editor of the IEEE Transactions on Automatic Control (Jan. 1990 - Dec. 1992); Designated Reviewer for the IEEE Control Systems Society (nonlinear control area); Panelist for Fellowship Programs, National Research Council (nominated); Nominator for 1990 Japan Prize. Served as referee for the following Journals and Funding agencies; IEEE Transactions on Automatic Control; IEEE Transactions on Systems, Man, and Cybernetics; IEEE Transactions on Circuits and Systems; IEEE Transactions on Biomedical Engineering; International Journal of Control; SIAM Journal on Control and Optimization; Systems and Control Letters; Journal of Mathematical Systems, Estimation, and Control; Automatica; National Science Foundation; National Security Agency

 Briefly list the most important publications and presentations from the past five years – "Asynchronous Sequential Machines with Adversarial Intervention: the Use of Bursts", J. M. Yang and J. Hammer, *International Journal of Control*, Vol. 83, No. 5, 956–969, 2010

"Output Feedback and Bursts: Overcoming Uncertainty in Asynchronous Sequential Machines", J. Peng and J. Hammer, *Proceedings of the International Federation of Automatic Control Symposium on Nonlinear Control Systems*, Bologna, Italy, September 2010.

"Input/Output Control of Asynchronous Sequential Machines with Races", J. Peng and J. Hammer, *International Journal of Control*, Vol. 83, No. 1, January 2010, pp. 125–144

"Optimal Low Error Control of Disturbed Systems", D. Chakraborty and J. Hammer, *Proceedings of the IEEE Conference on Systems, Man, and Cybernetics*, San Antonio, Texas, USA, October 11-14, 2009

"Generalized Realizations and Output Feedback Control of Asynchronous Sequential Machines with Races", J. Peng and J. Hammer, *Proceeding of the European Control Conference*, Budapest, Hungary, August 2009

"Using Bursts to Overcome The Effects of Adversarial Interventions on Asynchronous Sequential Machines", J. M. Yang and J. Hammer, *Proceedings of the Asian Control Conference*, Hong-Kong, August 27-29, 2009, pp. 943-948

 Briefly list the most recent professional development activities – Attended European and Asian Control Conferences, Mediterranean Conference on Control and Automation, IEEE Conference on Systems Man, and Cybernetics, International Conference of Applied Mathematics and Computing as well as other conferences.

# 1. Name – JOHN G. HARRIS

- 2. Education PhD, EE, California Institute of Technology, 1991; MS, EE, Massachusetts Institute of Technology, 1986; BSEE, Massachusetts Institute of Technology, 1983
- Academic experience Electrical & Computer Engineering, University of Florida, Chair and Professor, 2011-date, full time; Electrical & Computer Engineering, University of Florida, Interim Chair and Professor, 2009-2011, full time; Electrical & Computer Engineering, University of Florida, Professor, 2006-2009, full time; Electrical & Computer Engineering, University of Florida, Associate Chair, 1997-2006, full time; Electrical & Computer Engineering, University of Florida, Associate Chair, 1997-2006, full time; Electrical & Computer Engineering, University of Florida, Assistant Chair, 1993-1997, full time; Artificial Intelligence Lab, Massachusetts Institute of Technology, Postdoctoral Fellow, 1991-1997, full time
- 4. Non-academic experience Bolt Beranek and Newman Inc., Summer 1984 Intern, Worked on the Monarch multiprocessor, specifically, designed prototype dynamic memory registers for the Monarch processor chip, full time; International Business Machines Corp., Summer 1983 Intern, Designed a CMOS VLSI standard cell library. Layouts were automatically generated based upon electrical specifications, full time; Software Arts Inc. (Creators of VisiCalc), Summer 1982 Intern, Designed the Electrical Engineering Applications, Package for the TK!Solver program, full time
- 5. Certifications or professional registrations None
- Current membership in professional organizations Institute of Electrical & Electronic Engineers; International Society for Optical Engineering; International Neural Network Society; Speech Communication Associatioan
- Honors and awards Member of the Motorola Visionary Board 2002-2005; 1998-99 University of Florida Teaching Improvement Program Winner; NSF CAREER Award, 1995; NSF Postdoctoral Research Fellowship 1991-93, (NSF Division of Advanced Scientific Computing); Hughes Aircraft Graduate Doctoral Fellowship 1987-91; Tau Beta Pi (Engineering Honor Society); Eta Kappa Nu (Electrical Engineering Honor Society)
- 8. Service activities (within and outside of the institution) Founding member of the UF Biomedical Engineering Program; Member of the University of Florida Brain Institute, 1997-present; Member of the University of Florida Center for Smell and Taste, 1998-present; Member of the University of Florida Center for Research at the Bio/Nano Interface, 2000-present; ECE Graduate Admissions and Recruiting Coordinator, 2005-2009; Founder and organizer of ECE Graduate Seminar Course; UF MOSIS VLSI Fabrication Liaison, 1996-present; Member of many past ECE and BME department search committees; Associate Editor, Frontiers in Neuromorphic Engineering, 2008-present; President of IEEE Technical Committee on Neural Systems and Applications (NSA TC), Circuits & Systems Society; Co-organizer of yearly Telluride Neuromorphic Cognitive Workshop, 2009-2011; Member of the Program Committee for International

Conference on Informatics in Control, Automation and Robotics (ICINCO), 2005 – present; Associate Editor, IEEE Transactions on Biomedical Engineering, 1999-2008; Member of IEEE Technical Committee on Analog Signal Processing, Circuits & Systems Society; Member of the Scientific Review Committee for INTERSPEECH conference; Member of the Program Committee for the 20th symposium of the Brazilian Computer Society and the 22nd symposium of the Brazilian Microelectronics Society (SBCCI 2007) in Rio de Janeiro, Brazil

 Briefly list the most important publications and presentations from the past five years – "Mean firing rate spike representations for speech recognition," J.G. Harris and Yukun Feng, *Proceedings of 2010 IEEE International Symposium on Circuits and Systems*, pages 517 – 520, May 2010.

"A low bandwidth pulse-based neural recording system," Sheng-Feng Yen and J.G. Harris. *Ph.D. Research in Microelectronics and Electronic*, 2010, pages 1–4, July 2010

"A sawtooth waveform inspired pitch estimator for speech and music," A. Camacho and J. G. Harris, *Journal of the Acoustical Society of America*, 124:1638–1652, 2008

"Technology and signal processing for brain-machine interfaces," J.C. Sanchez, J.C. Principe, T. Nishida, R. Bashirullah, J.G. Harris, and J.A.B Fortes, *IEEE Signal Processing Magazine*, 25(1):29–40, 2008

10. Briefly list the most recent professional development activities – Attended IEEE International Symposium on Circuits and Systems annually, International Brain Inspired Cognitive Systems conference, International Joint Conference on Neural Networks

## 1. Name – **DOUGLAS M. JORDAN**

- Education PhD, EE, University of Florida, 1990; MS, EE, University of Florida, 1981; BSEE, University of Florida, 1980
- Academic experience Electrical and Computer Engineering, University of Florida, Research Assistant Scientist, 2010-present, full time; Electrical & Computer Engineering, University of Florida, Senior Lecturer, 2004-2010, full time; Electrical & Computer Engineering, University of Florida, Lecturer, 2000-2004, full time; Electrical Engineering, University of West Florida, Associate Professor, 1994-2000, full time
- 4. Non-academic experience Director of Research and Development, Smart Access Inc., Altamonte Springs, Florida, 1993-1994, full time
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations American Geophysical Union
- 7. Honors and awards 1998-UWF IEEE Student Chapter Teacher of the Year; 1994-Space Technology Hall of Fame; 1971-Lions Club Citizenship Award
- Service activities (within and outside of the institution) College of Engineering Tenure and Promotion Committee; Undergraduate Coordinator, Electrical and Computer Engineering
- Briefly list the most important publications and presentations from the past five years "Measured close lightning leader-step electric-field-derivative waveforms," J. Howard, M. A. Uman, C. J. Biagi, J. D. Hill, V. A. Rakov and D. M. Jordan, *J. Geophys. Res.*, Vol. 116, doi:10.1029/2010JD015249, 2011

"The Initial Stage Processes of Rocket-and-Wire Triggered Lightning as Observed by VHF Interferometry," 12 October 2010, S. Yoshida, C. J. Biagi, V. A. Rakov, J. D. Hill, M. V. Stapleton, D. M. Jordan, M. A. Uman, T. Morimoto, T. Ushio, Z. I. Kawasaki, and M. Akita, *J. Geophys. Res.*, Vol., doi:10.1029/2010JD0015185

"Observations of Stepping Mechanisms in a Rocket-and-Wire Triggered Lightning Flash," C. J. Biagi, M. A. Uman, J. D. Hill, D. M. Jordan, V. A. Rakov, and J. Dwyer, J. *Geophys. Res.*, Vol. 115, D23215, doi:10.1029/2010JD014616

"High-speed Video Observations of Rocket-and-Wire Initiated Lightning," C. J. Biagi, D. M. Jordan, M. A. Uman, J. D. Hill, W. H. Beasley, and J. Howard, *Geophys. Res. Let.*, Vol.36, L15801, doi:10.1029/2009GL038525, 2009

10. Briefly list the most recent professional development activities - None

- 1. Name **JASMEET JUDGE**
- 2. Education PhD, EE & AOSS, University of Michigan 1999; MS, EE, University of Michigan, 1994; BS, PHY, Stillman College, 1992
- Academic experience Associate Professor, Agricultural and Biological Engineering, University of Florida, 2008-present, full time; Director, Center for Remote Sensing, Agricultural and Biological Engineering, University of Florida, 2001-present, full time; Assistant Professor, Agricultural and Biological Engineering, University of Florida, 2001-2008, full time
- 4. Non-academic experience None
- 5. Certifications or professional registrations None
- Current membership in professional organizations American Society of Agricultural & Biological Engineers; Institute of Electrical & Electronic Engineers, Society of Women Engineers; American Geophysical Union
- Honors and awards Gamma Sigma Delta Honor Society of Agriculture, 2011; Outstanding Young Researcher, Florida Section ASABE, 2008; Outstanding Faculty Advisor in Region D, Society of Women Engineers, 2006
- 8. Service activities (within and outside of the institution) Member, Plant Science Research and Education Unit Advisory Council, UF/IFAS; Faculty Advisor, UF Chapter for the Society of Women Engineers; Member, Search and Screen Committee for Faculty and Research Scientist positions; Member, Department Computer Committee; Member, Department Graduate Curriculum Committee; Member, Department Agrisystems Major Committee; Member, Department Social Committee; Associate Editor, Transactions of ASABE, Applied Engineering in Agriculture, 2004-2007; Reviewer and Panel Review Member for NSF, USDA, USGS, NOAA, and NASA proposals; Reviewer of Journals: IEEE Transact ions in Geoscience & Remote Sensing, Journal of Hydrometeorology, Geophysical Research Letters, International Journal of Remote Sessing, Advances in Water Resources, Vadose Zone Hydrology, Water Resources Research; Technical Program Committee for IEEE-IGARSS; Chair, Remote Sensing Technical Committee, American Geophysical Union
- Briefly list the most important publications and presentations from the past five years "A Particle Filter-based Assimilation Algorithm for Improved Estimation of Root-zone Soil Moisture Under Dynamic Vegetation Condition", Nagarajan, K., J. Judge, W.D. Graham, and A. Monsivais-Huertero, *Adv. In Water Res.*, doi:10.1016/j.advwatres.2010. 09.019, 2010

"Understanding energy partitioning at the surface using temperature observations," Rutten, M.M., Steele-Dunne, S., Judge, J., and Giesen, N.V., *Vadose Zone Journal*, Vol 9, pp 1034-1045, 2010

"Comparison of backscattering models at L-band for growing corn," Monsivais-Huertero, A., and J. Judge, *IEEE Geosci. and Remote Sens. Letters*, doi 10.1109/LGRS.2010. 2050459, pp 24-28, 2010

"Effect of simultaneous state-parameter estimation and forcing uncertainties on root-zone soil moisture for dynamic vegetation," Monsivais-Huertero, A., W.D. Graham, Judge, J., and D. Agrawal, *Adv. In Water Resources Research*, 33, pp 468–484, 2010

"Extension of an existing model for soil water evaporation and redistribution under high water content conditions," Ritchie, J., C.H. Porter, J. Judge, J.W. Jones, and A.A. Suleiman, *Soil Sci. Soc. Am. J.*, 73, doi:10.2136/sssaj2007.0325, pp 792-801, 2009.

"Applying GLUE for estimating CERES-Maize genetic and soil parameters for sweet corn production," Casanova, J., and J. Judge, *Trans. ASABE*, 52(6), pp 1907-1921, 2009

"Calibration of an integrated land surface process and radiobrightness (LSP/R) model during summertime," Judge, J., A.W. England, J.R. Metcalfe, D. McNichol, and B.E. Goodison, *Adv. in Water Resources*, 31(1), pp. 189-202, 2008

"Microwave remote sensing of soil water: Recent advances and issues," Judge J., Invited paper, *Trans. of Ameri. Soc. Agri. Eng – Centennial Edition*, 50(5), pp 1645-1649, 2007

10. Briefly list the most recent professional development activities – LEAD-IFAS, 2010-2011, College of Agricultural and Life Sciences annual Teaching Enhancement Symposia

- 1. Name YOUNG JUNG
- 2. Education PhD, Computer Science, Ajou University, 2007; MS, Computer Science, Ajou University, 2002; BS, Information and Communication, Ajou University, 2000
- 3. Academic experience None
- 4. Non-academic experience Post Doctoral Researcher, Department of Information Science, University of Pittsburgh, full time; Ubquitous Computing Network, Team Manager, 2005-2009, full time, developing community computing model and its' applications; Ubquitous Computing Network, Researcher, 2003-2005, full time, development of S/W platofrms for intelligent Multi-Modal systems
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations –Collaborative Computing: Newtorking, Applications and Worksharing
- Honors and awards Best Presentation Award, "Dynamic Privileges Insertion using refinement of Privilege in Role Graph Model", In Proc. of Korea Information Science Society 2003 Fall Conference, Vol.30, No.1, pp.637-639, Oct. 2003
- Service activities (within and outside of the institution) Publicity Chair, Conference on Collaborative Computing: Newtorking, Applications and Worksharing, 2008; Program Committee Member, Conference on Collaborative Computing: Newtorking, Applications and Worksharing 2009 and 2010
- Briefly list the most important publications and presentations from the past five years "Situation-Aware Community Computing Model for Developing Dynamic Ubiquitous Computing Systems", Youna Jung, Minsoo Kim, *Journal of Universal Computer Science*, Vol.16 no.15, pp 2139-2174, August 2010

"DRiBAC: Context-Aware Dynamic Role Interaction Access Control", Youna Jung, Minsoo Kim, James B. D. Joshi, Proc. of 12<sup>th</sup> IEEE International Conference of Information Reuse and Integration (IRI), pp. 88–93, 2011

10. Briefly list the most recent professional development activities - None

#### 1. Name – PRAMOD P. KHARGONEKAR

- Education PhD, EE, University of Florida, 1981; MS, Math, University of Florida, 1980; B.Tech, EE, Indian Institute of Technology, 1977
- Academic experience –Electrical & Computer Engineering, University of Florida, Professor and Eckis Chair, 2009-date, full time; Electrical & Computer Engineering, University of Florida, Dean, College of Engineering; Associate Vice President, Engineering & Industrial, Experiment Station; Eckis Professor, 2001-2009, full time; Electrical Engineering & Computer Science, University of Michigan, Chair, 1997-2001, full time; Electrical Engineering & Computer Science, University of Michigan, Associate Chair, 1995-1997, full time; Electrical Engineering & Computer Science, University of Michigan, Professor, 1989-1995, full time; Electrical Engineering, University of Michigan, Professor, 1988-1989, full time; Electrical Engineering, University of Minnesota, Associate Professor, 1984-1988, full time; Electrical Engineering, University of Florida, Assistant Professor, 1981-1984, full time
- 4. Non-academic experience None
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations -
- Honors and awards 1997 Distinguished Alumnus Award, Indian Institute of Technology; 1994 - University of Michigan, Research Excellence Award; 1993 - IEEE Fellow; 1992 - Japan Society for Promotion of Science Fellowship; 1992 - Teaching Excellence Award, University of Michigan; 1991 - IEEE W. R. G. Baker Prize Award; 1991 - University of Michigan, EECS, Teaching Excellence Award; 1990 - George Axelby Best Paper Award; 1989 - American Automatic Control Council's Donald Eckman Award; 1987 - George Taylor Award for Research, University of Minnesota; 1985 - National Science Foundation Presidential Young Investigator Award
- Service activities (within and outside of the institution) Member, Budget Allocation Committee, September 2006-April 2007; Member, Board of Directors, University of Florida Foundation, May 2003-June 2009; Chair, Search Committee, Director of Institutional Research, January 2006-April 2006; Member, Board of Directors, Center for Entrepreneurship and Innovation, College of Business, August 2002-date; Member, Advisory Board, International Center for Automated Information Research, Levin College of Law, August 2002-date; Member, Board of Directors, University of Florida Research Foundation, July 2001-June 2008; Member, Advisory Board, School of Natural Resources and Environment, July 2003-date; Member, Research Policy Council, University of Florida, July 2001- June 2009; Member, Advisory Board, Digital Worlds Institute, January 2002- June 2009; Member, Deans Advisory Group, University of Florida Foundation, August 2004- June 2008; Chair, Search Committee, Dean of College of Liberal Arts and Sciences, University of Florida, September 2007- April 2008;

Member, Executive Committee, Howard Hughes Medical Institute Science for Life Program, University of Florida, August 2009-date; Member, Advisory Board, Computational Biology Program, University of Florida, August 2009- date; Member, Strategic Planning Task Force for Energy Research, College of Engineering, University of Florida, September 2009–date; Member, Strategic Planning Task Force for Leadership Initiatve, College of Engineering, University of Florida, October 2009-date; Associate Editor, Mathematical Problems in Engineering, November 1994-date; Member, External Review Team, Faculty of Engineering, Yale University, November 2006; Member, Advisory Board, Indian Institute of Technology, Mumbai, India, 2006-date; Member, Executive Committee, Board of Directors, IIT Bombay Heritage Fund, 2005-date; Member, Public Policy Committee, Engineering Deans Council, September 2005-date; Chair, Awards Committee, American Automatic Control Council, 2005-date

 Briefly list the most important publications and presentations from the past five years – "Control of Neural Synchrony Using Channelrhodopsin-2: A Computational Study," S. Talathi, P. R. Carney, and P. P. Khargonekar, *Journal of Computational Neuroscience*, DOI 10.1007/s10827-010-0296-6, pp, 2010.

"Analysis of video-based Microscopic Particle Trajectories Using Kalman Filtering," P. H. Wu, A. Agarwal, H. Hess, P. P. Khargonekar, and Y. Tseng, *Biophysical Journal*, vol. 98, pp. 2822–2830, 2010.

"Support Vector Machine Algorithms for Seizure Detection in an Animal Model of Chronic Epilepsy," M. Nandan, S. Talathi, S. Myers, W. L. Ditto, P. P. Khargonekar, and P. R. Carney, *Journal of Neural Engineering*, vol. 7(3), pp. 036001-036012, 2010.

"Distribution-free consistency of empirical risk minimization and support vector regression," J.-W. Lee and P. P. Khargonekar, *Mathematics of Control, Signals, and Systems*, vol. 21, pp. 111--125, 2009.

"Detectability and Stabilizability of Discrete-Time Switched Linear systems," J. W. Lee and P. P. Khargonekar, *IEEE Transactions on Automatic Control*, vol. 54, pp. 424-437, 2009.

"Optimal Output Regulation for Discrete-Time Switched and Markovian Jump Linear Systems," J. W. Lee and P. P. Khargonekar, *SIAM J. Control and Optimization*, vol. 47, pp. 40-72, 2008.

 Briefly list the most recent professional development activities – Sabbatical at University of California, 2010-2011; attended conferences including International Conference on Distributed Computing Systems and IEEE Conference on Decision and Control

- 1. Name GLORIA J. KIM
- Education PhD, BME, Georgia Institute of Technology and Emory University, 2007; MSE, BME, Johns Hopkins University, 2001, BS, Chm, Seoul National University, 1997
- Academic experience Research Assistant Professor, Electrical and Computer Engineering, University of Florida, 2011-date; Chemistry, University of Florida, 2010-2011, full time; SUNY-Buffalo, Research Assistant Professor, Biomedical Engineering, 2009-2010, full time, SUNY-Buffalo, Research Assistant Professor, Electrical Engineering, 2009, full time,
- 4. Non-academic experience company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations American Chemical Society, Biomedical Engineering Society, Controlled Release Society
- 7. Honors and awards None
- Service activities (within and outside of the institution) Manuscript reviewer for IOP Biomedical Materials and Nanotechnology; Faculty Facilitator, Southeast Regional Conference of Asian American Leaders Workshop, UF
- Briefly list the most important publications and presentations from the past five years "Multimodal Biological Imaging and Therapeutics, Kim, Gloria J., Weibo, Cai, Drummen, Gregor, *Nano Today*, 2011

"Fabrication of Nanoporous Membrane and Its Nonlithographic Patterning Using Electrospinning and Stamp-thru-mold (ESTM)," Pitfee Jao, Melroy Machado, Xiaoyu Cheng, David E. Senior, Gloria J. Kim, Dalian Ding, Wei Sun, and Yong-Kyu Yoon, IEEE MEMS 2011 Conference, Cancun, Mexico, January 23-27, 2011.

"HFT-T, a Targeting Nanoparticle, Enhances Specific Delivery of Paclitaxel to Folate Receptor-Positive Tumors," Xu Wang, Jun Li, Yiqing Wang, Kwang Jae Cho, Gloria Kim, Ada Gjyrezi, Lydia Koenig, Paraskevi Giannakakou, Hyung Ju C. Shin, Mourad Tighiouart, Shuming Nie, Zhuo (Georgia) Chen, and Dong M. Shin, *ACS Nano*, 3 (2009) 3165–3174.

"Computer-controlled Multidirectional Ultraviolet Lithography for Integrated Microsystems," Yong-Kyu Yoon, Jungkwun Kim, and Gloria J. Kim, *Proceedings of the 2009 NSF Engineering Research and Innovation Conference*, 2009

"Spatially Controlled Electrospun Solid Gradient Nanofibers for Guided Spiral Ganglion Neuron Culture," Pitfee Jao, Wei Sun, Yong-Kyu Yoon, and Gloria J. Kim, Biomedical Engineering Society Annual Fall Meeting, Austin, TX, October 6-9, 2010.

10. Briefly list the most recent professional development activities – attended various conferences.

#### 1. Name – HERMAN LAM

- Education PhD, EE, University of Florida, 1979; ME, EE, University of Florida, 1974; BSEE, Georgia Institute of Technology, 1972
- Academic experience –Electrical & Computer Engr., University of Florida, Associate Professor, 1985-date, full time; Electrical & Computer Engr., University of Florida, Assistant Professor, 1980-1985, full time; Computer and Information Science, University of Florida, Adjunct Assistant Professor, 1979-1980, full time
- 4. Non-academic experience None
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electrical & Electronic Engineers, Association for Computing Machinery
- Honors and awards 1993-UF Teaching Improvement Program (TIP); 1991-College of Engineering Undergraduate Teaching Award; 1991-ECE Supervisor of the Outstanding Senior Design Project; 1991-Outstanding Paper Award (coauthor), 7th Int. IEEE Conference on Data Engineering, Japan; 1990-ECE Award for Outstanding Supervisor of an EE Core Laboratory; 1990-ECE Award for Best PhD Dissertation (co-chair); 1989-ECE Award for Outstanding Supervisor of an EE Core Laboratory; 1988-ECE Award for Outstanding Supervisor of an EE Core Laboratory; 1988-ECE Award for Outstanding Supervisor of an EE Core Laboratory; 1986-Tau Beta Pi Undergraduate Teaching Award
- 8. Service activities (within and outside of the institution) Chair, Department of ECE Curriculum Committee; Chair, EEL 4712 course committee; Member, EEL 3701 course committee; Department of ECE ABET Monitoring Committee; CE ABET subcommittee for Program Outcomes; Reviewer for journals: IEEE Transactions on Software Engineering; International Journal of Computer and Information Science; IEEE Transactions on Computers; ACM Computing Surveys; Data and Knowledge Engineering Journal; IEEE Transactions on Knowledge and Data Engineering; IEEE MICRO, Journal of Computer Systems Science and Engineering; IEEE Internet Computing; IEEE Journal of Transactions on Parallel and Distributed Systems; IBM Systems Journal; IEEE Transaction on Service Computing; Editorial Board Member of the International Journal of Business Process Integration and Management, 2004-2009; Program committee, workshop for ICEBE 2008 (International Conference on ebusiness Engineering), Xi'an, China, October 22-24, 2008; Program committee, ReConFig'08,2008 International Conference on ReConFigurable Computing and FPGAs, Cancun, Mexico, December 3-5, 2008; Program committee, IEEE International Conference on Web Services (ICWS08), Beijing, China, September 23-26, 2008; Program committee, International Workshop on High-Performance Reconfigurable Computing Technology and Applications (HPRCTA'09), Portland, Oregon November 15, 2009; Program committee, 2009 International Conference on ReConFigurable

Computing and FPGAs (ReConFig09), Cancun, Mexico, December 9-11, 2009; Program committee, 2009 Symposium on Application Accelerators in High-Performance Computing (SAAHPC09), Urbana, Illinois, July 27-31, 2009; Program committee, WoRMES'2009 International Workshop on Reconfigurable and Multi-core Embedded Systems, Vancouver, Canada, Aug 29-31, 2009.

 Briefly list the most important publications and presentations from the past five years – "Reconfigurable Supercomputing with Scalable Systolic Arrays and In-Stream Control for Wavefront Genomics Processing," C. Pascoe, A. Lawande, H. Lam, A. George, Y. Sun, W. Farmerie, and M. Herbordt, *Proc. of Symposium on Application Accelerators in High-Performance Computing* (SAAHPC), Knoxville, TN, July 13-15, 2010

"Novo-G: A View at the HPC Crossroads for Scientific Computing," A. George, H. Lam, A. Lawande, C. Pascoe, and G. Stitt, ERSA Keynote for Reconfigurable Supercomputing Panel, *Proc. Of ERSA'10: Engineering of Reconfigurable Systems and Algorithms*, Las Vegas, Nevada, July 12 - 15, 2010

"A Framework for Core-level Modeling and Design of Reconfigurable Computing Algorithms," G. Wang, G. Stitt, H. Lam, and A. George, *Proc. of High-Performance Reconfigurable Computing Technology and Applications Workshop* (<u>HPRCTA</u>) at SC'09, Portland, OR, Nov. 15, 2009.

"Constraint-based Brokering (CBB) for Publishing and Discovery of Web-services", S. Degwekar, H. Lam, and S.Y.W. Su, *Journal of Electronic Commerce Research*, Vol. 7, 2007, pp. 45 – 67.

 Briefly list the most recent professional development activities – 2011 NSF I/UCRC (Industry/University Collaborative Research Center) Annual Meeting, Arlington, Virginia; NSF Center for High-Performance Reconfigurable Computing (CHREC) Annual Workshop 2010, Gainesville, Florida; High-Performance Reconfigurable Computing Technology and Applications Workshop (<u>HPRCTA</u>) at SC'10, New Orleans, LA; International Conference on Engineering of Reconfigurable Systems and Algorithms, Las Vegas, Nevada

# 1. Name – HANIPH A. LATCHMAN

- 2. Education PhD, EE, Oxford University, 1986; BS, EE, University of the West Indies
- Academic experience Electrical & Computer Engineering, University of Florida, Professor, 2003-date, full time; Electrical & Computer Engineering, University of Florida, Associate Professor, 1993-2003, full time; Electrical & Computer Engineering, University of Florida, Assistant Professor, 1986-1993, full time
- 4. Non-academic experience Computer Networking and Forensics Consultant, 1995-date, part time; Co-founder and Technical Director, Jamaica Online Information Systems & Qualitech Computer Services, 1994-date, part time
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electrical & Electronic Engineers, American Society of Engineering Education
- 7. Honors and awards 2004-Jamaica Computer Soceity Best Paper Award; 2004-St. Jago Founders Day Award for Excellence in the Field of Education; 2003-Best Paper Award, ICCCT; 2002-Best Paper Award, ACM MSWiM; 2001-Recipient of Fullbright Fellowship, Czech Technical University of Prague; 2000-Recipient of Boeing Welliver Summer Fellowship; 1999-IEEE 2000 Undergraduate Teaching Award; 1998 UF Teacher of the Year; 1998 Teaching Improvement Project (TIP) Award; 1997-IEEE Senior Member; 1996-International Who's Who of Professional Management; 1990-College of Engineering Teacher of the Year Award; 1989-Tau Beta Pi Award for Excellence in Undergraduate Engineering Education; 1988-IEEE/HKN Outstanding Undergraduate Instructor; 1988 -Tau Beta Pi Teacher of the Year Award; 1983 Rhodes Scholar
- 8. Service activities (within and outside of the institution) Member of Department Faculty Search Committee, September 2006-date; Member of Department Curriculum Committee, 2005-date; Member of the Board, University Center for Excellence in Teaching, 1998-date; Member, Rhodes/Marshal Scholarship Selection Committee, 1991-date; Associate Editor for IEEE Transactions on Education, 1998-date; Member IEEE Education Society Administration Committee, December 2002-date; Reviewer for International Journal of Control, 1990-date; Reviewer for IEEE Transactions on DSP, 1995-date; Reviewer for IEEE Transactions on Education, 1998-date; Reviewer for IEEE Transactions on Education, 1995-date; Reviewer for IEEE Transactions on Education, 1995-date; Reviewer for Interactive Multimedia Electronic Journal of Computer Enhanced Learning, 1999-date; Reviewer for John Wiley, 1990-date; Reviewer for Oxford University Press 1995-date; Reviewer for IEEE Signal Processing Letters 1995-date; Review for the National Science Foundation 1997
- 9. Briefly list the most important publications and presentations from the past five years *"Multimedia Powerline Communication Systems"*, Haniph A. Latchman and Larry

Yonge, POWER LINE COMMUNICATIONS - Theory and Applications for Narrowband and Broadband Communications Over Power Lines, pp 443-448, John Wiley, 2010

*"Industry Specifications for Powerline Communication Systems"*, <u>Latchman, Haniph</u> and Larry Yonge, POWER LINE COMMUNICATIONS - Theory and Applications for Narrowband and Broadband Communications Over Power Lines, pp 364-382, John Wiley, 2010

"Statistical Traffic Modeling of MPEG Frame Size: Experiments and Analysis", Kyungwoo Kim, Haniph Latchman, *Journal of Systems, Cybernetics and Informatics*, Vol.7, no.6, pp. 54-59, 2009.

"ELRP-Enhanced Limited Round Robin Mechanism using priority Policy over Bluetooth Networks," Sunguk Lee, Haniph A. Latchman, Byungjoo Park, *International journal of Advanced Science and Technology* (IJAST) Volume 6, pp.61-70, 2009

"EVGATOR An Enhanced Visualization Simulator for Networking Protocol Analysis," Yu-Ju Lin, Sunguk Lee, Haniph A. Latchman, Byungjoo Park, *International Journal of Software Engineering and Its Applications*, Vol.3,No.3, pp19-32, 2009

"Performance Enhancement for Fast Handover for Mobile IPv6 by Reducing Out-of-Sequence Packets", *Wireless Personal Communications (WIRE)*, Vol 10.1007/s11277-008, pp. 9455-8, Byungjoo Park, Haniph Latchman, March 2008.

 Briefly list the most recent professional development activities – Attend various conferences including IEEE International Conference on Control and Automation, World Multi-Conference on Systems, Cybernetics and Informatics, IEEE International Conference on Power Line Communications and Its Applications

- 1. Name MARK E. LAW
- Education PhD, EE, Stanford University, 1988; MS, EE, Stanford University, 1982; BS, CprE, Iowa State University, 1981
- Academic experience –College of Engineering, University of Florida, Associate Dean for Academic Affairs, 2009-date, full time; Electrical & Computer Engineering, University of Florida, Professor and Department Chair, 2003-2009, full time; Electrical & Computer Engineering, University of Florida, Professor, 1997-2003, full time; Electrical & Computer Engineering, University of Florida, Associate Professor, 1993-1997, full time; Electrical & Computer Engineering, University of Florida, Associate Professor, 1993-1997, full time; Electrical & Computer Engineering, University of Florida, Associate Professor, 1988-1993, full time
- 4. Non-academic experience –Hewlett-Packard, Device Development and Modeling, Engineer, 1982-1984, full time
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Fellow, Institute of Electronics and Electrical Engineers; Member, The Bohmische Physical Society; Materials Research Society; Electrochemical Society; American Physical Society; American Society for Engineering Education; Tau Beta Pi; Phi Kappa Phi; Eta Kappa Nu; Sigma Xi
- Honors and awards 2010, IEEE Electron Device Society J. J. Ebers Award, 2007-Professional Achievement Citation in Engineering, Iowa State University; 2006-Semiconductor Research Corporation Aristotle Award; 2004-Semiconductor Research Corporation Faculty Recognition Award for Student Recruiting; 1998-IEEE Fellow; 1997-UF Research Foundation Faculty Award; 1996- College of Engineering Teacher of the Year; 1995-UF Teaching Improvement Program (TIP) Award; 1994-Outstanding Young Alumnus of Iowa State University; 1994- Iowa State University, College of Engineering, Professional Progress Award; 1993-Semiconductor Research Corporation Teaching Excellence Award; 1992- National Science Foundation Presidential Faculty Fellow
- Service activities (within and outside of the institution) Member, University Honors Committee Advisory Board, 2010-date; Chair, ECE Undergraduate Curriculum Reform Committee, 2008-2009; Chair, Electrical and Computer Engineering Department, 2003-2009; Chair, ECE Faculty Search Committee, 2003; Chair, College of Engineering Nano-Bio Faculty Search, 2002-2003; Chair, Department Strategic Planning Committee, 2002-2003; Co-Director of the Nanoscience and Technology Institute 2001-2002; Member, Academic Personnel Board, 2001-2003; Chair, Ad-hoc Committee to Review College Core, 1999; Director of Undergraduate Programs 1998-2000; Chair, Departmental Curriculum Committee, 1995-2000; Member, College Curriculum Committee, 1998-2001; Member, College Petitions Committee, 1996-98; Member, College Committee to Examine the Undergraduate Core, 1995; Member, Departmental Faculty Development Committee, 1995, 1998; Chair, Ad-hoc Committee on Curriculum Reform, 1993-1994;

Member, Departmental Student Awards Committee, 1991-1994; Member, Departmental Graduate Committee, 1989-93; Member, Numerous Search Committees; Chair, Iowa State University Honors Advisory Board, 2008-date; Associate Editor, IEEE Circuits and Devices Magazine, 2002-2006; Member, Editorial Board, Journal of Modeling and Simulation of Microsystems, 1998-2008; Editor-in-Chief, IEEE Journal of Technology Computer Aided Design, 1996-2001; Co-Organizer, MRS Symposium on Front-End Processing, 2008; Co-Organizer, AVS Ultra-Shallow Junctions Workshop, 2005; Lead Organizer, MRS Symposium on Front-End Processing, 2002; General Chair, International Electron Devices Meeting, 2000; Co-Organizer, MRS Symposium on Front-End Processing, 1999; Technical Program Vice Chair, International Electron Devices Meeting, 1998; General Chair, Simulation of Semiconductor Processes and Devices, 1997; President, Southeast ECE Department Heads Organization, 2007; Vice-President, Southeast ECE Department Heads Organization, 2006; Secretary, Southeast ECE Department Heads Organization, 2005; Vice President, Electron Device Society Technical Activities, 2003-2006; Chairman, Electron Device Society TCAD Technical Advisory Board, 2000-2004; Member, Electron Device Society VLSI Circuits Technical Advisory Board, 2001-2004

 Briefly list the most important publications and presentations from the past five years – "Laser-Induced Current Transients in Strained-Si Diodes", H. Park, D. Cummings, R. Arora, J.A. Pellish, R. Reed, R.D. Schrimpf, D. McMorrow, S.E. Armstrong, U. Roh, T. Nishida, M.E. Law, S.E. Thompson, *IEEE Transactions on Nuclear Science*, 56(1), 2009, p. 3203-9

"Stressed Multidirectional Solid-Phase Epitaxial Growth of Si," N.G. Rudawski, K.S. Jones, S. Morarka, M.E. Law, and R.G. Elliman, *Journal of Applied Physics*, 105, 2009, p. 081101.1-20.

"Modeling two-dimensional solid-phase epitaxial regrowth using level set methods," . Morarka, N. G. Rudawski, M. E. Law, K. S. Jones, and R. G. Elliman, *Journal of Applied Physics*, 105, 2009, p. 053701.1-5

"Level set modeling of the orientation dependence of solid phase epitaxial regrowth", Morarka, S., N.G. Rudawski, and M.E. Law, *Journal of Vacuum Science & Technology B: Microelectronics and Nanometer Structures*, 26(1), January, 2008, pp. 357–361.

10. Briefly list the most recent professional development activities – Technical Conference Attendance – typically IEDM, NSREC, and others during each year

- 1. Name XIAOLIN 'ANDY' LI
- Education Ph.D., Computer Engineering, Rutgers University, 2005; Ph.D. Communications & Information Engineering, National University of Singapore, 2001; MS, Zhejiang University, 1998; BS, Qingdao University, 1995
- 3. Academic experience –Electrical & Computer Engineering, University of Florida, Associate Professor, 2010-date, full time; Department of Computer Science, Oklahoma State University, Assistant Professor and Director for the Scalable Software Systems Laboratory, 2005-2010, full time
- Non-academic experience –IBM Austin Lab, Extreme Blue Intern, 2003, full time; Center for Wireless Communications (now I2R), Singapore, Research Staff, 2001, full time
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electrical and Electronic Engineers, Association of Computing Machinery
- Honors and awards National Science Foundation CAREER Award, 2010; Finalist for the The Second IEEE International Scalable Computing Challenge (SCALE 2009); Outstanding Service Award, The 17th IEEE International Conference on Computer Communications and Networks (ICCCN 2008); Outstanding Service Award, The IEEE 21st International Conference on Advanced Information Networking and Applications (AINA 2007); Best Paper Award, the 2007 IEEE International Symposium on Ubisafe Computing
- Service activities (within and outside of the institution) Associate Editor, Security and Communication Networks (SCN), Wiley, 2007-date; Associate Editor, International Journal of Communication Systems (IJCS), Wiley, 2007-date; Executive Committee, IEEE Technical Committee on Scalable Computing (TCSC); Coordinator, Technical Area of Sensor Networks, IEEE TCSC; Panelist, National Science Foundation (NSF), (CSR, STCI, REU, CAREER), 2006, 2007, 2009; Program Chair, The 8th IEEE International Conference on Dependable, Autonomic and Secure Computing (DASC 2009), Chengdu, China December 12-14, 2009; Program Chair, The 6th IEEE Workshop on Challenges of Large Applications in Distributed Environments (CLADE 2008) in conjunction with HPDC 2008; Program Chair, The 5th International Conference on Autonomic and Trusted Computing (ATC 2008); TPC member, INFOCOM 2009-2012, MASS09, CCGrid08 and 07, Globecom08 and 07, ICPADS08, ICC10
- 9. Briefly list the most important publications and presentations from the past five years "A Taxonomy of Peer-to-Peer Desktop Grid Paradigms," H. Zhao, X. Liu, and X. Li, *Cluster Computing Journal*, Springer, 2010

"PPDD: Scheduling Multi-Site Divisible Loads in Single-Level Tree Networks," X. Li and B. Veeravalli, *Cluster Computing Journal*, Springer, Vol. 13 (1), 2010

"Trailing Mobile Sinks: A Proactive Data Reporting Protocol for Wireless Sensor Networks," X. Liu, H. Zhao, X. Yang, X. Li, and N. Wang, 7th IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS 2010)

"Advanced Computational Infrastructures for Parallel and Distributed Adaptive Applications," M. Parashar and X. Li (Eds.), John Wiley & Sons, 2009

"H-Trust: A Group Trust Management System for Peer-to-Peer Desktop Grid," H. Zhao and X. Li, *Journal of Computer Science and Technology* (JCST), Springer, Vol. 24 (5), 2009

"ASGrid: Autonomic Management of Hybrid Sensor Grid Systems and Applications," X. Li, X. Liu, H. Zhao, H. Zhao, N. Jiang, and M. Parashar, *International Journal of Sensor Networks* (IJSNet), Inderscience, Vol. 6 (2/3), 2009

"Coordinated Workload Scheduling in Hierarchical Sensor Networks for Data Fusion Applications," X. Li and J. Cao, *Journal of Computer Science and Technology* (JCST), Springer, Vol. 23 (3), May 2008

"Enabling Scalable Parallel Implementations of Structured Adaptive Mesh Refinement Applications", S. Chandra, X. Li, T. Saif and M. Parashar, *The Journal of Supercomputing*, Springer (TJS), Vol. 39 (2), Feb. 2007

10. Briefly list the most recent professional development activities – Added various conferences including IEEE International Symposium on Cluster Computing and the Grid; the IEEE International Parallel and Distributed Processing Symposium

### 1. Name – JENSHAN LIN

- Education PhD, EE, University of California-Los Angeles, 1994; MS, EE, University of California-Los Angeles, 1991; BS, Electrophysics, National Chiao Tung University, 1987
- 3. Academic experience –Department of Electrical and Computer Engineering, University of Florida, Professor, 2007-date, full time; Department of Electrical Engineering National Taiwan University, Taipei, Taiwan, Visiting Professor, 2006-2007, full time; Department of Electrical and Computer Engineering, Associate Professor, 2003-2007, University of Florida, full time; Rutgers University, WINLAB, Visiting Professor, 2001-2002, full time
- 4. Non-academic experience –Technical Manager, High Speed Circuits Research, Agere Systems, Holmdel, New Jersey, Lead a group of researchers, 2001-2003, full time; Technical Manager, High Speed and RF Design Research, Bell Laboratories, Lucent Technologies, Murray Hill, New Jersey, Lead a group of researchers, 2000-2001, full time; Member of Technical Staff, Bell Laboratories, AT&T/Lucent Technologies, Murray Hill, New Jersey, Conducted research on RF and high speed electronics, 1994-2000, full time; Research Engineer, Industrial Technology Research Institute (ITRI), Hsinchu, Taiwan, Maintained national standards of inductance and its calibration system, 1989-1990, full time; Second Lieutenant, Army, Taiwan, 1987-1989, full time
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electrical and Electronic Engineers
- 7. Honors and awards 2010 IEEE Fellow; 2008 IEEE MTT-S Graduate Fellowship Award with Changzhi Li; 2007 IEEE Microwave Theory and Techniques Society N. Walter Cox Award; 2007 IEEE Radio and Wireless Symposium Best Student Paper Award 2nd place with Changzhi Li; 2004 IEEE MTT-S Undergraduate/Pre-Graduate Scholarship Award with Jerry Jun; 1997 Eta Kappa Nu Outstanding Young Electrical Engineer Award Honorable Mention; 1994 UCLA School of Engineering and Applied Science Outstanding PhD Award
- Service activities (within and outside of the institution) Chair, Electronics Division, ECE Department 2008-2010; Member, Faculty Development Committee, ECE Department 2009-2010; Member, Search Committee, College of Engineering Associate Dean for Academic Affairs, 2009; Elected Senator, University of Florida Faculty Senate Aug. 2006-Aug. 2009; Elected member of Faculty Council, College of Engineering Aug. 2006-Aug. 2009; Member, Budget Committee, ECE Department 2008-2009; Member, Intel Chair Search Committee, ECE Department 2004-2007; Member, PhD Exam Committee, ECE Department 2004-2008; Member, Faculty Search Committee, ECE Department 2003-2006; Member, Financial Aid Committee, ECE Department 2004; Chair, Technical Coordinating Committee, IEEE MTT-S AdCom (2010-date); Elected Member, IEEE MTT-S AdCom (2006-date); Technical Program Chair, IEEE Radio and

Wireless Symposium (2009); General Chair, IEEE RFIC Symposium (2008); Technical Program Chair, IEEE RFIC Symposium (2007); Associate Editor, IEEE Transactions on Microwave Theory and Techniques (2006-2010)

 Briefly list the most important publications and presentations from the past five years – "High Sensitivity Software Configurable 5.8 GHz Radar Sensor Receiver Chip in 0.13 μm CMOS for Non-contact Vital Sign Detection," C. Li, X. Yu, C.-M. Lee, D. Li, L. Ran, J. Lin, *IEEE Transactions on Microwave Theory and Techniques*, vol. 58, no. 5, pp. 1410-1419, May 2010

"Method of Load/Fault Detection for Loosely Coupled Planar Wireless Power Transfer System with Power Delivery Tracking," Z. N. Low, J. Casanova, P. Maier, J. Taylor, R. A. Chinga, J. Lin, *IEEE Transactions on Industrial Electronics*, vol. 57, no. 4, pp. 1478-1486, April 2010.

"A Low-Power Linear SiGe BiCMOS Low-Noise Amplifier for Millimeter-Wave Active Imaging," A. Y.-K. Chen, Y. Baeyens, Y.-K. Chen, J. Lin, *IEEE Microwave and Wireless Components Letters*, vol. 20, no. 2, pp.103-105, Feb. 2010.

"Design and Optimization of a Class-E Amplifier for a Loosely Coupled Planar Wireless Power System," J. Casanova, Z. N. Low, J. Lin, *IEEE Transactions on Circuits and Systems II*, Vol. 56, No. 11, pp. 830-834, Nov. 2009

"A 36-80 GHz High Gain Millimeter-Wave Double-Balanced Active Frequency Doubler in SiGe BiCMOS," A. Y.-K. Chen, Y. Baeyens, Y.-K. Chen, J. Lin, *IEEE Microwave and Wireless Components Letters*, Vol. 19, No. 9, pp. 572-574, September 2009

"Random Body Movement Cancellation in Doppler Radar Vital Sign Detection," C. Li, J. Lin, *IEEE Transactions on Microwave Theory and Techniques*, Vol. 56, No. 12, pp. 3143-3152, December 2008

"A Packaged and ESD-Protected Inductorless 0.1-9.2 GHz Wideband CMOS LNA," T. Chang, J. Chen, L. Rigge, J. Lin, *IEEE Microwave and Wireless Components Letters*, Vol. 18, No. 6, pp. 416-418, June 2008

10. Briefly list the most recent professional development activities – Attended various conferences

- 1. Name **NIMA MAGHARI**
- Education PhD, EE, Oregon State University, 2010; BS, EE, University of Tehran, 2005
- 3. Academic experience –Department of Electrical & Computer Engineering, University of Florida, Assistant Professor, 2011-date, full time
- 4. Non-academic experience None
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electric and Electronic Engineers
- 7. Honors and awards Recipient of AMD/CICC Student Scholarship Award for outstanding student paper, IEEE CICC 2008
- 8. Service activities Reviewer of IEEE-International Conference on Circuit and Systems (ISCAS), Journal of Solid-State Circuits (JSSC), Transactions on Circuits and Systems (TCAS) and Transactions on Very Large Scale Integration Systems (TVLSI)
- Briefly list the most important publications and presentations from the past five years "A 30% Beyond VDD Signal Swing 9-ENOB Pipelined ADC using a 1.2V 30dB Loop-Gain Opamp", B. R. Gregoire, T. Musah, N. Maghari, S.Weaver and U. Moon, IEEE Asian solid-state circuits conference (A-SSCC), 2011.

"A Third-Order DT ΔΣ Modulator Using Noise-Shaped Bi-directional Single-Slope Quantizer," N. Maghari and U. Moon, *IEEE J. Solid-State Circuits*, Vol. 41, pp 2882-2891, Dec. 2011.

"Domino Logic Based ADC Intended for Digital Synthesis," S. Weaver, B. Hershberg, N. Maghari and U. Moon, *IEEE Transactions on Circuits and Systems—II: Express Briefs*, Vol. 42, pp 744-747, Nov. 2011.

"Time-Interleaved Noise-Shaped Integrating Quantizers," Y. Hu, N. Maghari, T. Musah, U. Moon,, *IET Electron Lett.*, April 2010

"Hybrid Delta-Sigma/Pipelined Analog-to-Digital Converter", O. Rajaee, T. Musah, N. Maghari, S. Takeuchi, M. Aniya, K. Hamashita, and U. Moon, , *IEEE J. Solid-State Circuits (JSSC)*, Apr. 2010.

"Noise-Shaped Integrating Quantizers in  $\Delta\Sigma$  Modulators", N. Maghari, G. C. Temes, and U. Moon, *IEE Electron. Lett.*, vol. 42, pp. 612-613, June 2009.

"74dB SNDR Multi-Loop Sturdy-MASH Delta-Sigma Modulator Using 35dB Opamp Gain," N. Maghari, S. Kwon, G. C. Temes, and U. Moon, *IEEE J. Solid-State Circuits (JSSC)*, vol. 44, No. 8, page 2212-2221, Aug 2009

 Briefly list the most recent professional development activities – Attended various seminars and conferences.
 Attended the IEEE International Conference of Solid-state Circuits (ISSCC), Feb 2012, IEEE Asian Solid-State Circuits Conference (A-SSCC), Nov 2011, IEEE International Conference of Solid-state Circuits (ISSCC), Feb 2011
# 1. Name – ANDREA MATSUNAGA

- 2. Education PhD, ECE, University of Florida, 2010; MS, EE, University of Sao Paulo, 2001; BS, EE, University of Sao Paulo, 1998
- 3. Academic experience None
- 1. Non-academic experience Advanced Computing & Information System Laboratory, University of Florida, Assistant Research Scientist, Researching new approaches for developing a permanent and powerful cloud computing infrastructure to link biological data from collections across the United States into a single unified web interface, overcoming the "data silos" problem, as part of the NSF funded Integrated Digitized Biocollections (iDigBio) project, 2011-date; Advanced Computing & Information System Laboratory, University of Florida, PostDoctoral Associate, Managed VMware and Xen-based virtual computing systems for the DARPA Reorganization and Plasticity to Accelerate Injury Recovery (REPAIR) project, 2010-2011, full time.
- 1. Certifications or professional registrations None
- 2. Current membership in professional organizations Institute of Electrical and Electronic Engineers, Women in Electrical & Computer Engineering
- 3. Honors and awards Finalist, 3<sup>rd</sup> IEEE International Scalable Computing Challenge, 2010
- 4. Service activities Reviewer for IEEE High Performance Distributed Computing, IEEE International Parallel & Distributed Processing Symposium and Concurrency, IEEE International conference on Autonomic Computing and Computation: Practice and Experience, IEEE International Conference on Cloud Computing, IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing, and ACM Computing Surveys
- Briefly list the most important publications and presentations from the past five years "Towards Closed-Loop Brain-Machine Experiments across Wide-Area Networks," P. Rattanatamrong, A. Matsunaga, A. J. Brockmeier et al., *Proc. of the 5th International IEEE EMBS Conference on Neural Engineering*, Cancun, Mexico, 2011, pp. 453-456

"User-level virtual networking mechanisms to support virtual machine migration over multiple clouds," M. Tsugawa, P. Riteau, A. Matsunaga, and J. A. B. Fortes, "*IEEE International Workshop on Management of Emerging Networks and Services*, Miami, Florida: IEEE Computer Society, 2010, pp. 588-592

6. Briefly list the most recent professional development activities – Attended various seminars and conferences.

### 1. Name – JANISE McNAIR

- 2. Education PhD, ECE, Georgia Institute of Technology, 2000; MS, EE, University of Texas at Austin, 1993; BSEE, University of Texas at Austin, 1991
- 3. Academic experience Electrical & Computer Engineering, University of Florida, Associate Professor, 2009-date, full time; Electrical & Computer Engineering, University of Florida, Assistant Professor, 2000-2009, full time
- 4. Non-academic experience Graduate Co-op, Electromagnetic Sciences, Inc., Norcross, Georgia, 1996, full time; Systems Engineering Intern, IBM, Austin, Texas, 1993, full time
- 5. Certifications or professional registrations None
- Current membership in professional organizations Institute of Electrical & Electronic Engineers; IEEE Communications Society; IEEE Computer Society; Association for Computing Machinery; American Society of Engineering Education; National Society of Black Engineers
- Honors and awards 2008-Selected to participate in DARPA Computer Science Study Group; April-June 2007 WSN Location Verification paper in ScienceDirect's Top 25 Hottest Articles
- 8. Service activities (within and outside of the institution) Chair, Graduate Recruitment and Admissions Committee, Department of Electrical and Computer Engineering, 2009-present; Chair, ABET Course Subcommittee for Data and Computer Communications; Member, ABET Subcommittee for Computer Engineering Program; Member, College of Engineering Information Technology Strategic Plan Committee; Faculty Advisor, National Society of Black Engineers (NSBE), University of Florida, 2007-present; Organizer, Women in Engineering Seminars, UF Engineers Week, 2003-2006, Mentor, University of Florida Minority Mentor Program, 2001-2004; Participant in National Science Foundation Proposal Review Panels; Associate Editorships: Elsevier Ad Hoc Networks Journal, 2004-date, ACM/Baltzer Wireless Networks Journal 2010-date; IEEE Transactions on Mobile Computing, 2003-2008; Conference Organizing Committees, Workshop Co-Chair, IEEE INFOCOM, March 2010, General Vice Chair, IEEE International Conference on Testbeds and Research Infrastructures for the Development of Networks and Communities, May 2007, Technical Program Committee Chair, IFIP International Conference on Networking, May 2007; Finance Chair, Int'l Symposium on Power Line Communications (ISPLC), March 2006, Publicity Chair, ICST Mobileware 2008 - 2010; Session Chair IEEE MILCOM, 2007-2010; Panel Organizer, Wireless and Mobile Security in Distributed Systems, IEEE Symposium on Reliable Distributed Systems, October 2005, Member, Technical Program Committee for various IEEE and ACM Conferences
- 9. Briefly list the most important publications and presentations from the past five years "Residual Energy Aware Channel Assignment in Cognitive Radio Sensor Networks," X. Li,

D. Wang, J. McNair, and J. Chen, Proc of *IEEE Wireless Communications and Networking Conference (WCNC)*, March 2011

"Effect of On/Off Misbehavior on Overhearing Based Cooperation Scheme for MANET," X. Mao and J. McNair, Proc of *IEEE Military Communications (MILCOM) Conference*, October 2010.

"Enhancing Small Satellite Communication through Effective Antenna System Design," P. Muri, O. Challa and J. McNair, Proc *IEEE Military Communications (MILCOM) Conference*, October 2010

<u>Security in Ad Hoc and Sensor Networks</u>, World Scientific Publishing, Inc., R. Beyah, J. McNair, and C. Corbett, book editors, World Scientific Publishing Company, 2009, ISBN-10: 981427108X

"On the Interaction between Localization and Location Verification for Wireless Sensor Networks," D. Al-Abri and J. McNair, *Elsevier Computer Networks Journal*, vol 52, issue 14, pp. 2713-2727, October 2008

10. Briefly list the most recent professional development activities – Attended many conferences including the International ICST Conference on Simulation Tools and Techniques, IEEE Green Technology Conference, IEEE Avionics, Fiber-Optics and Photonics Conference, International Conference on Wireless Algorithms, Systems and Applications

- 1. Name **SETH McNEILL**
- Education PhD, Electrical & Computer Engineering, University of Florida, 2009; MS, , Electrical & Computer Engineering, University of Florida, 2004; BSE, Electrical Engineering, Walla Walla University, 2001
- 3. Academic experience institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time University of Florida, Adjunct Professor, 2011-2012, full time;
- 4. Non-academic experience company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time Tetracam, Inc, Director of Engineering Development, 2009-2011, Engineering, project management, product development, grant writing, marketing, sales, and customer service; Tetracam, Inc., Contract Projects Engineer, Matlab to DSP product development path testing, image stabilization
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electrical and Electronic Engineers
- 7. Honors and awards None
- Service activities (within and outside of the institution) Secretary, UF Gator Amateur Radio Club, 2007-2009; Science Fair Judge, Alachua Region Science & Engineering Fair, 2008; UF Small Satellite Design Club
- Briefly list the most important publications and presentations from the past five years "A low-E magic angle spinning probe for biological solid state NMR at 750 MHz." McNeill, S. A., Gor'kov, P. L., Shetty, K., Brey, W. W., Long, J. R., *J Magn Reson*. 2009, 197 (2):135–144

"The helical structure of surfactant peptide KL4 when bound to POPC: POPG lipid vesicles.," Mills, F. D., Antharam, V. C., Ganesh, O. K., Elliott, D. W., McNeill, S. A., Long, J. R. *Biochemistry*, 2008; 47(32):8292-300

10. Briefly list the most recent professional development activities - None

# 1. Name – **SEAN MEYN**

- Education PhD, Electrical Engineering, McGill University, 1987; ME, Electrical Engineering, McGill University, 1985; BA, Mathematics, University of California, Los Angeles, 1982
- Academic experience University of Florida, Department of Electrical & Computer Engineering, Professor & Robert C. Pittman Eminent Scholar Chair, 2012-date, full time; University of Illinois-Urbana Champaign, Professor, 2001-2011, full time; University of Illinois-Urbana Champaign, Assistant/Associate Professor, 1989-2000, full time; Australian National University, Postdoctoral Fellow, 1987-1989, full time
- 4. Non-academic experience None
- 5. Certifications or professional registrations None
- Current membership in professional organizations Institute of Electrical and Electronic Engineers, Institute for Operations Research and the Management Sciences, Society for Industrial and Applied Mathematics, Phi Beta Kappa
- 7. Honors and awards 2010 Outstanding Advisors List, University of Illinois-Urbana Champaign
- 8. Service activities (within and outside of the institution) UCIC ECE Fellowship Committee; Technical Program Committee member. 2009 IEEE International Symposium on Information Theory; Technical Program Committee member. ICCS 2010; Program chair, 2010 Allerton Conference on Communication, Control, and Computing, and Local arrangements chair in 2011; Conference chair, 2011 Allerton Conference on Communication, Control, and Computing; Member of Guest Editorial Board for IEEE Transactions on Information Theory Special Issue on Information Theory in Biomedical Sciences. Vol. 56, No. 2, Feb. 2010, Past associate editor of IEEE Trans. Auto. Control, SIAM J. on Control & Optimization, Queueing Systems: Theory and Applications, and Systems and Control Letters.
- Briefly list the most important publications and presentations from the past five years "Stability and asymptotic optimality of generalized MaxWeight policies," S. Meyn, SIAM J. Control Optim., 47(6):3259 – 3294, 2009

"A random search framework for convergence analysis of distributed beamforming with feedback." C. Lin, V. Veeravalli, and S. P. Meyn , *IEEE Trans. Inform. Theory*, 56(12):6133–6141, 2010

"A universal divergence-rate estimator for steganalysis in timing channels," S. Sadasivam, P. Moulin, and S. Meyn. 2010 IEEE International Workshop on Information Forensics and Security (WIFS), pages 1–6, 2010.

"Minimax robust quickest change detection." J. Unnikrishnan, V. V. Veeravalli, and S. Meyn, *IEEE Trans. Inform. Theory*, 57(3):1604–1614, 2011

"A control theorist's perspective on dynamic competitive equilibria in electricity markets," G. Wang, A. Kowli, M. Negrete-Pincetic, E. Shafieepoorfard, and S. Meyn In Proc. 18th World Congress of the International Federation of Automatic Control (IFAC), Milano, Italy, 2011. (Invited)

"TD-Learning with Exploration,". S. Meyn and A. Surana, Proc. of the 50th IEEE Conf. on Dec. and Control, Orlando, FL, 2011. (Invited.)

"Feature selection for composite hypothesis testing with small samples: fundamental limit and algorithms," D. Huang and S. Meyn, International Conference on Acoustic, Speech and Signal Processing (ICASSP 2012), 2012

10. Briefly list the most recent professional development activities – Attended various conferences.

## 1. Name – **ROBERT C. MOORE**

- Education PhD, EE, Stanford University, 2007; MSE, EE, Stanford University, 2001; BSE, EE, Stanford University, 1999
- 3. Academic experience –University of Florida, Department of Electrical & Computer Engineering, Assistant Professor, 2007-date, full time

Non-academic experience – Stanford University, Aero/Astro Department, Intern, summer 1998, Developed a data-transfer mechanism for GPS pseudolites in mining car automation, full time; Baan USA, Inc., Quality Assurance Engineer, Intern, Summer 1997, Designed and implemented automated test suites for the Bann V Internet application, full time; Fidelity Investments, Inc., Computer Analyst, 1994-1995, Designed and implemented software solutions for a financial-projections consulting company, full time

- 4. Certifications or professional registrations None
- 5. Current membership in professional organizations American Geophysical Union; International Union of Radio Science; Institute of Electrical and Electronics Engineers
- Honors and awards 2008 Young Scientist Award for XXIXth USI General Assembly; 2006 National Science Foundation Antarctic Service Medal; 1998 Hewlett Packard Project Award for Analog Design, Stanford University
- 7. Service activities (within and outside of the institution) Graduate Recruitment and Admissions Committee; Secretary-Elect, American Chapter of the International Union of Radio Science (URSI), Commission H, 2011-present; U.S. Science Coordinator, Arrival Heights Site of Special Scientific Interest, Office of Polar Programs, National Science Foundation, 2010-present; Atmospheric and Space Electricity Executive Committee Member, American Geophysical Union, 2009-present; RF Ionospheric Interactions Workshop Steering Committee Member, 2009-present; Reviewer - Journal of Geophysical Research, Geophysical Research Letters, Radio Science, IEEE Transactions on Electromagnetic Compatibility
- Briefly list the most important publications and presentations from the past five years "Magneto-ionic polarization and GPS signal propagation through the ionosphere," Moore, R. C. and Y. T. Morton, *Radio Sci.*, 46, RS1008, doi:10.1029/2010RS004380, 2011

"ELF/VLF Wave Generation Using Simultaneous CW and Modulated HF Heating of the Ionosphere," Moore, R. C., and D. Agrawal, *J. Geophys. Res.*, doi:10.1029/2010JA015902, 2011

"A new method for VLF remote-sensing of lightning-induced ionospheric disturbances," *International Union of Radio Science*, USNC/URSI, Boulder, CO, January 4-7, 2011

"D-region modification at HAARP: An overview of recent experimental observations obtained by the University of Florida," Moore, R. C., (TALK SA31C-04), American Geophysical Union, AGU, San Francisco, CA, 2010

"Ionospheric Effects of Lightning at Camp Blanding, Florida," Moore, R. C., XXIXth URSI General Assembly, Chicago, IL, August 7-16, 2008

"Massive disturbance of the daytime lower ionosphere by the giant  $\gamma$ -ray flare from magnetar SGR 1806-20," Inan, U. S., N. G. Lehtinen, R. C. Moore, K. Hurley, S. Boggs, D. M. Smith, and G. J. Fishman, *Geophys.Res. Lett.*, *34*, L08103, doi:10.1029/2006GL029145

"Subionospheric VLF observations of transmitter-induced precipitation of inner radiation belt electrons," Inan, U. S., M. Golkowski, M. K. Casey, R. C. Moore, W. Peter, P. Kulkarni, P. Kossey, E. Kennedy, S. Meth, and P. Smit, *Geophys. Res. Lett.*, *34*, L02106, doi:10.1029/2006GL028494

 Briefly list the most recent professional development activities – American Geophysical Union Annual Conference; RF Ionospheric Interactions Workshop Annual Meeting; International Union of Radio Science Annual Meeting; Polar Aeronomy and Radio Science Summer School

# 1. -Name – **KAMRAN MOHSENI**

- Education PhD, EE, California Institute of Technology, 2000; MS, Aero & Applied Math, Imperial College, 1993; BS, Mechanical Engineering, University of Science and Technology, 1990
- Academic experience University of Florida, Department of Electrical & Computer Engineering, Professor, 2011-date, part time; University of Florida, Department of Mechanical & Aerospace Engineering, W. P. Bushnell Endowed Professor, 2011-date, part time; Aerospace Engineering Sciences, University of Colorado at Boulder, Associate Professor, 2007-2011, full time; Aerospace Engineering Sciences, University of Colorado at Boulder, Assistant Professor, 2001-2007, full time
- 4. Non-academic experience None
- 5. Certifications or professional registrations None
- Current membership in professional organizations Institute of Electrical and Electronic Engineers, Society of Industrial and Applied Mathematics, American Institute of Aeronautics and Astronautics, American Society of Mechanical Engineers, American Physical Society
- Honors and awards Provost Faculty Achievement Award, University of Colorado at Boulder, 2008; NSF Faculty Early Career Development (CAREER) Program award, 2007; DARPA Young Faculty Award, 2007; Dean's Award for Professional Progress, University of Colorado at Boulder, 2006
- 8. Service activities Reviewer for several professional journals
- Briefly list the most important publications and presentations from the past five years "A fluid based coordination of a wireless sensor network of unmanned aerial vehicles: 3D simulation and wireless communication characterization," A. Shaw and K. Mohseni, *IEEE Sensors Journal, Issue on Cognitive Sensor Networks*, 11(3), 722-736, 2011

"A ridge tracking algorithm and error estimate for efficient computation of Lagrangian coherent structures," P. Young and K. Mohseni, *Chaos*, 20, 017504, 2010.

"Digitized Heat Transfer: A New Paradigm for Thermal Management of Compact Micro Systems," Baird and K. Mohseni, *IEEE Transactions on Components and Packaging Technologies*, 31(1), 143-151, 2008.

"Fabrication of tapered SU-8 structure and effect of sidewall angle for a variable focus microlens using EWOD," Y-J. Chang, K. Mohseni, and V. Bright, *Sensors and Actuators A*, 136(2), 546-553, 2007.

10. Briefly list the most recent professional development activities – Attended various conferences.

# 1. Name – **TOSHIKAZU NISHIDA**

- 2. Education PhD, ECE, University of Illinois-Urbana, 1988; MS, ECE, University of Illinois-Urbana, 1985; BS, Engr Physics, University of Illinois-Urbana, 1983
- 3. Academic experience institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time Electrical & Computer Engineering, University of Florida, Associate Chair, 2011-date, full time; Electrical & Computer Engineering, University of Florida, Professor, 2009-date, full time; Electrical & Computer Engineering, University of Florida, Associate Professor, 1993-2009, full time; Visiting Associate Professor, University of Tokyo, Japan, 1994, part time; Electrical & Computer Engineering, University of Florida, Assistant Professor, 1988-1993, full time; Visiting Associate Professor, Osaka University, Japan, 1993, part time
- 4. Non-academic experience None
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electrical & Electronic Engineers
- Honors and awards 2008 NASA Invention Award; 2008 IEEE Senior Fellow; 2006 UF ECE HKN Teacher of the Year Award; 2006 IEEE Electron Device Society Distinguished Lecturer; 2005 UF ECE HKN Teacher of the Year Award; 2003 College of Engineering Teacher of the Year; 2002 AIAA Aerodynamic Measurement Technology Best Paper Award; 2001 AIAA Aerodynamic Measurement Technology Best Paper Award; 1996 HKN Teacher Appreciation Award; 1995 State of Florida Teaching Improvement Program (TIP) Award
- 8. Service activities (within and outside of the institution) ECE Faculty Search Committee; UF Nanoscience Research Facility Advisory Committee; UF EPI Internal Advisory Board; UF Graduate Teaching Assistant Award Committee; Member, Technical Program Committee, 25th Symposium on Microelectronics Technology and Devices, Sao Paulo, Brazil (2010–date); Member, Technical Program Committee, IEEE Sensors Conference (2008–2009); IEEE EDS Distinguished Lecturer (2006–date); Treasurer, Gainesville Chapter of IEEE EMBS (2007–date); Reviewer for journals: Applied Physics Letters IEEE/ASME Journal of Microelectromechanical Systems, IEEE Electron Devices Letters, IEEE Transactions on Electron Devices, IEEE Transactions on Industrial Electronics, IEEE Transactions on Power Electronics, Journal of Applied Physics, Journal of the Electrochemical Society
- Briefly list the most important publications and presentations from the past five years "Simulation of AlGaN/GaN high-electron-mobility transistor gauge factor based on twodimnensional electron gas density and electron mobility," Min Chu, Andrew D. Koehler, Amit Gupta, Toshikazu Nishida, and Scott E. Thompson, *J. Appl. Phys*, Vol. 108, p. 104502, 2010

"A comparative study of strain effects on 3D, 2D and 1D silicon logic devices: Predicting the future of strained silicon," Mehmet Baykan, Scott E. Thompson, and Toshikazu Nishida, *J. Appl. Phys.* Vol. 108, p. 093716, 2010

"Extraction of AlGaN/GaN HEMT Gauge Factor in the Presence of Traps," A. D. Koehler, A. Gupta, M. Chu, S. Parthasarathy, K. J. Linthicum, J. W. Johnson, T. Nishida, S. E. Thompson, *IEEE Electron Device Letters*, pp. 665-667, 2010 (Digital Object Identifier: 10.1109/LED.2010.2048195).

"Laser-Induced Current Transients in Strained-Si Diodes," H. Park, D. J. Cummings, R. Arora, J. A. Pellish, R. Reed, R. D. Schrimpf, D. McMorrow, S. E. Armstrong, U. Roh, T. Nishida, M. E. Law, S. E. Thompson, *IEEE Transactions Nuclear Science*, Vol.56, pp.3203-3209, Dec. 2009

"Manufacturable plastic microfluidic valves using thermal actuation," K. Pitchaimani, B.C. Sapp, A. Winter, A. Gispanski, T. Nishida, and Z. H. Fan, *Lab on a Chip*, Vol. 9 pp. 3082-3087, 2009

"Effect of mechanical strain on 1/f noise in metal-oxide semiconductor field-effect transistors," Ji-Song Lim, Antonio Acosta, Scott E. Thompson, Gijs Bosman, Eddy Simoen, and Toshikazu Nishida, *J Appl. Phys.*, Vol. 105, pp. 054504-1–054504-11, 19 March 2009

"Demonstration of a wireless, self-powered, electroacoustic liner system," A. Phipps, F. Liu, L. Cattafesta, M. Sheplak, and T. Nishida, *J. Acoust. Soc. Am.*, Vol. 125, pp. 873-881, February 2009

"Temperature dependence of enhanced hole mobility in uniaxial strained p-channel metaloxide-semiconductor field-effect transistors and insight into the physical mechanisms," Xiaodong Yang, Srivatsan Parthasarathy, Yongke Sun, Andrew Koehler, Toshikazu Nishida, and Scott E. Thompson, *Appl. Phys. Lett.* 93, pp. 243503-1 – 243503-3, 15 December 2008

 Briefly list the most recent professional development activities – Sabbatical leave at Interuniversity Microelectronics Centre, Leuven, Belgium investigating strain effects on advanced semiconductor devices, Fall 2008

# 1. Name – CHARLES H. "CHAD" OVERMAN IV

- 2. Education MS, ECE, University of Florida, 2001; BSEE, University of Florida, 1995
- Academic experience –Electrical & Computer Engineering, University of Florida, 2010date, Research Associate Scientist, full time; Electrical & Computer Engineering, University of Florida, Associate in Engineering, 2002-2010, full time; Electrical & Computer Engineering, University of Florida, Systems Engineering, 1998-2002, full time
- 4. Non-academic experience None
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electrical and Electronic Engineers, Altera University Program Member
- 7. Honors and awards None
- 8. Service activities (within and outside of the institution) Volunteer Mission trip for two weeks in remote areas of Amazon River Basin in Brazil, November 2009; Website Administrator, Amazon Vision Ministries, a non-profit organization dedicated to serving the isolated areas of the Amazon Basin, 2008-2009
- Briefly list the most important publications and presentations from the past five years "Doppler Beam-Sharpening for Clutter Rejection in 40 mm Direct-Fire Application", Overman IV, C. H. and Kurtz, J. L., Technical Report on OTA DAAE30-1-9-0800, presented to Army Research and Development Engineering Center, February 2009

"Digital fuze processor test results," Overman IV, C. H. and Kurtz, J. L., Technical Report on OTA DAAE30-1-9-0800 Task# 39, presented to Army Research and Development Engineering Center, January 2007

10. Briefly list the most recent professional development activities - None

- 1. Name JOSE C. PRINCIPE
- 2. Education Agregado, University of Aveiro, 1985; PhD, EE, University of Florida, 1979, MS, EE, University of Florida, 1974; BS, EE, University of Porto, 1972
- Academic experience –Electrical & Computer Engineering, University of Florida, Distinguished Professor, 2002-date, full time; Electrical & Computer Engineering, University of Florida, BellSouth Professor, 1995-date, full time; Electrical & Computer Engineering, University of Florida, Professor, 1993-1995, full time; Electrical & Computer Engineering, University of Florida, Associate Professor, 1987-1993, full time
- 4. Non-academic experience None
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electrical & Electronic Engineers
- 7. Honors and awards 2011-IEEE Neural Network Pioneer Award, Computational Intelligence Society; 2010-Honoris Causa Degree, Aalto University, Helisnki, Finland; 2007-IEEE Engineering in Medicine and Biology Society's Career Achievement Award; 2007-UF Research Professor Fellowship; 2006-Gabor Award, International Neural Network Society; 2005-Fellow of American Institute of Medical and Biological Engineering; 2005-Laurea ad Honoris Causa in Ingegneria Elettronica. Universita degli Studi di Reggio Calabria Mediterranea; 2005-Career Service Award, IEEE Engineering in Medicine and Biology Society; 2002 -University of Florida Doctoral Dissertation Advisor/Mentoring Award; 2002 -University of Florida Distinguished Professor of Electrical and Biomedical Engineering; 2000-IEEE Fellow; 1999-UF Research Professor Fellowship; 1991-Innovation and Creativity Award, Portuguese Electronic Industry Association, with P. Oliveira and B. Cunha
- Service activities (within and outside of the institution) Chair Academic Personnel Board, 2010; *Founder Editor in Chief* of IEEE Reviews on Biomedical Engineering, 2007-2010; ADCOM Committee of the IEEE Computational Intelligence Society, 2010-2011; Editorial Board of Cognitive Computation, Springer, 2009-2011; Selection Committee for the IEEE Medal on Health Care Technologies, 2009-2010; Editorial Board of the EURASIP book series on Cognitive Engineering, 2009; Advisory Committee for the Italian Society for Neural Networks, 2009
- Briefly list the most important publications and presentations from the past five years Principe J., "Information Theoretic Learning: Renyi's Entropy and Kernel Perspectives," Springer, 2010

Liu W., Principe J., Haykin S., "Kernel Adaptive Filtering: a Comprehensive Introduction", John Wiley, 2010

Darmanjian S., Principe J., "Spatial-temporal Clustering of Neural data using Linked Mixtures of HMMs", Eurasip J. on Advances in Sig Proc., Article ID 892461, 16 pages, doi:10.1155/2009/892461

Liu W., Park II, Principe J.,"An information theoretic approach of designing sparse kernel adaptive filters," IEEE Trans. on Neural Networks, Vol. 20, # 12, 1950-1961

Euliano T, Marossero D, Nguyen M, Euliano N., Principe J., Edwards R., "Spatiotemporal electrohysterography patterns in normal and arrested labor", Am J Obstet Gynecol 2009; vol 200, #1, pp 1- 3, (Editor Choice Article).

10. Briefly list the most recent professional development activities – Attend an average of three conferences per year including IEEE conference on Wireless Communications & Networking, IEEE Workshop Machine Learning for Sig. Processing, IEEE Neural Engineering Conference, and the International Conference on Human Computer Interaction

#### 1. Name – VLADIMIR A. RAKOV

- 2. Education PhD, EE, Tomsk Polytechnic, 1983; MS, EE, Tomsk Polytechnic, 1977
- Academic experience –Electrical & Computer Engineering, University of Florida, Professor, 1998-date, full time; Electrical & Computer Engineering, University of Florida, Associate Professor, 1991-1998, full time; High Voltage Research Institute at Tomsk Polytechnic, Russia, Director of Lightning Research Laboratory, 1984-1994, full time; High Voltage Research Institute at Tomsk Polytechnic, Russia, Senior Scientist, 1983-1984, full time; High Voltage Research Institute at Tomsk Polytechnic, Russia, Scientist, 1979-1983, full time; Electrical Engineering, Tomsk Polytechnic, Russia, Assistant Professor, 1977-1979, full time
- 4. Non-academic experience None
- 5. Certifications or professional registrations None
- Current membership in professional organizations Fellow, IEEE; Fellow, Institution of Engineering and Technology; American Geophysical Union; Fellow, American Meteorological Society; IEEE Power Engineering Society; IEEE EMC Society
- Honors and awards Life Member of the Advisory Committee of the Centre of Excellence on Lightning Protection; 2005 IET Fellow; 2004 AMS Fellow; 2003 IEEE Fellow; 2004 NLSI Annual Recognition Award; 2001 IEEE Power Engineering Society Surge Protective Devices Committee, Prize Paper Award; 2001 and 2007 University of Florida Research Foundation Professorship (three year award); 1999 ASEE Southeastern Section Medallion Certificate, Research Unit Award
- 8. Service activities (within and outside of the institution) Faculty Development Committee, Member, 2006; Electromagnetics and Energy Systems Division, Chair, 2005-2010; Graduate Recruiting and Aid Committee, Member, 2005-date; Course Committees for EEL 3211 and EEL 3473, Member; Chair for EEL 3472; Technical Program Committee on Lightning for the biennial International Zurich Symposium on Electromagnetic Compatibility, Chairman, 1997-2009; CIGRE Working Group WG C4-407 "Lightning Parameters for Engineering Applications", Convener, 2008-2011; CIGRE Working Group WG C4-410 "Lightning Striking Characteristics for Very High Structures", Member, 2010-2013; National Fire Protection Association Committee on the Standard for the Installation of Lightning Protection Systems, Member, 2004–2010; Underwriters Laboratories Standards Technical Panel for Surge Protective Devices, Member, 2003-date; Scientific Committee of the International Conference on Lightning Physics and Effects and GROUND, Member, 2004-date; Steering Committee of the International Project on Electromagnetic Radiation from Tall Structure Lightning, Member (U.S. Representative), 2002-date; National Lightning Safety Institute, Board of Advisors, Member, 2002-date; Steering Committee of the International Symposium on Lightning Protection, Member, 1998-date; International Commission on Atmospheric Electricity, Member, 1999-date; Scientific Committee of the International Conference on

Lightning Protection (ICLP), Member, 2000-date; Editor or Associate Editor for three technical journals

 Briefly list the most important publications and presentations from the past five years – "Triggered Lightning", in "Lightning: Principles, Instruments and Applications", V.A. Rakov, eds. H.D. Betz, U. Schumann, and P. Laroche, Springer, 691 p. 2009, ISBN 978-1-4020-9078-3, pp. 23-56

"Electromagnetic Pulses Produced by Bouncing-Wave-Type Lightning Discharges", A. Nag and V.A. Rakov, *IEEE Trans. on EMC*, Special Issue on Lightning, Vol. 51, No. 3, pp. 466-470, August 2009

"Overview of recent progress in lightning research and lightning protection," V.A. Rakov and F. Rachidi, *IEEE Trans. on EMC*, Special Issue on Lightning, Vol. 51, No. 3, pp. 428-442, August 2009

"Some Inferences on the Role of Lower Positive Charge Region in Facilitating Different Types of Lightning," A. Nag and V.A. Rakov, *Geophys. Res. Lett.*, 36, L05815, doi:10.1029/2008GL036783, 2009

10. Briefly list the most recent professional development activities – Guest Professorships: Doshisha University, Japan, June-July 2009; attended various conferences including annual International Zurich Symposium on Electromagnetic Compatibility and the International Symposium on Lightning Protection

- 1. Name KATHIE S. RUSSELL
- Education MA, English, Florida Atlantic University, 2000; BA, English, Florida Atlantic University, 1996; Certificate, Teaching Enlish as a Second Language, Cambridge University, 1992
- Academic experience institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time University of Florida, Electrical & Computer Engineering, Associate Adjunct Professor, part time; Santa Fe College, Associate Adjunct Profesor, 2004-date, part time; Nova Southeastern University, Adjunct Instructor, 2000-present, part time; American British Academy, Teacher, 1991-1994, full time
- 4. Non-academic experience None
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations None
- 7. Honors and awards Nominee, Adjunct Professor of the Year, Broward Community College
- 8. Service activities (within and outside of the institution) Newsletter Editor, ECE Department, University of Florida, 2012-date
- 9. Briefly list the most important publications and presentations from the past five years None
- 10. Briefly list the most recent professional development activities None

# 1. Name – ERIC M. SCHWARTZ

- 2. Education PhD, ECE, University of Florida, 1995; MS, ECE, University of Florida, 1989; BSEE, University of Florida, 1984; BSME, University of Florida, 1984
- Academic experience –Electrical and Computer Engineering, University of Florida, Master Lecturer and Associate Director, Machine Intelligence Laboratory, 2008-date, full time; Electrical & Computer Engineering, University of Florida; Senior Lecturer, 2004-2008, full time; Electrical & Computer Engineering, University of Florida, Lecturer, 1998-2004, full time; Electrical & Computer Engineering, University of Florida, Visiting Assistant Professor, 1995-1998, full time
- Non-academic experience Allen-Bradley Corporation, Cleveland, Ohio, Engineer, Summer 1998, Developed fixed point programs for a digital signal processor used in machine controllers and developed some alternate control techniques for estimation of unknown parameters, full time
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electrical & Electronic Engineers
- Honors and awards 2005-Anderson/CLAS Scholar Faculty Honoree; 2004-Anderson/CLAS Scholar Faculty Honoree; 2003-Anderson/CLAS Scholar Faculty Honoree; 2003-UF Teacher of the Year; 2003-College of Engineering Teacher of the Year; 2002-Anderson/CLAS Scholar Faculty Honoree; 2001-Anderson/CLAS Scholar Faculty Honoree; 2000-Anderson/CLAS Scholar Faculty Honoree
- Service activities (within and outside of the institution) Student Chapter Advisor, IEEE UF Student Chapter, Fall 2001-date; Member, College of Engineering Scholarship, Fellowship & Awards Committee, Fall 2006-date; Member, Computer Engineering ABET Committee, Spring 2006- present; Treasurer, IEEE Gainesville Section, 2002-date
- Briefly list the most important publications and presentations from the past five years "SubjuGator 2010," Patrick Walters, Subrat Nayak, Devin Hughes, Thomas P. Feeney, Gautam Dash, Jose Morales, Nic Fischer, Jacob Collums, Eric M. Schwartz, A. Antonio Arroyo, 2010 Florida Conference on Recent Advances in Robotics, UNF, Jacksonville, Florida, May 20-21, 2010

"Three Dimensional Attitude Estimation of the Autonomous Underwater Vehicle, SubjuGator," Devin Hughes, Subrat Nayak, Patrick Walters, Gautam Dash, Dr. Eric M. Schwartz, 2010 Florida Conference on Recent Advances in Robotics, UNF, Jacksonville, Florida, May 20-21, 2010. "Object Detection and Template Matching in a Subaquatic Environment," Shashank Sawant, Abhinav Pandey, Eric M. Schwartz, Florida Conference on Recent Advances in Robotics, UNF, Jacksonville, Florida, May 20-21, 2010.

"Handwritten Character Recognition using Template Matching," Shashank Sawant, Abhinav Pandey, Eric M. Schwartz, Florida Conference on Recent Advances in Robotics, UNF, Jacksonville, Florida, May 20-21, 2010.

"TailGator: Design and Development of Autonomous Trash collecting Robot," Subrat Nayak, Bryan Hood, Owen Allen, Cory Foskey, Ryan Stevens, Edward Kallal, Jeff Johnson, Erik Maclean, Eric M. Schwartz, Florida Conference on Recent Advances in Robotics, FAU, Jupiter, Florida, May 21-22, 2009.

"Eye Detection Using Morphological and Color Image Processing," Tanmay Rajpathak, Ratnesh Kumar and Eric Schwartz, Florida Conference on Recent Advances in Robotics, FAU, Jupiter, Florida, May 21-22, 2009.

"Useful Sensors and Mechanisms for Mobile Robots," Timothy Martin, Eric Schwartz and A. Antonio Arroyo, Florida Conference on Recent Advances in Robotics, FAU, Jupiter, Florida, May 21-22, 2009.

"ATD: Design and Construction of the Autonomous Test Driver," Ryan Stevens, Eric Schwartz and A. Antonio Arroyo, Florida Conference on Recent Advances in Robotics, FAU, Jupiter, Florida, May 21-22, 2009

10. Briefly list the most recent professional development activities – Attend various conferences.

- 1. Name JOHN M. SHEA
- Education PhD, EE, Clemson University, 1998; MS, EE, Clemson University, 1995; BSEE, CprE, Clemson University, 1993
- 3. Academic experience –Electrical & Computer Engineering, University of Florida, Associate Professor, 2005-date, full time; Assistant Professor, Electrical & Computer Engineering, University of Florida, 1999-2005, full time
- 4. Non-academic experience ExtemporalWireless, Inc., Gainesville, Florida, Vice President of Engineering, 2004-2010, part time
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electrical & Electronic Engineers
- Honors and awards 2004 Finalist for Eta Kappa Nu Outstanding Young Electrical Engineer; 1996 Fred W. Ellersick Award for Best Paper, IEEE Military Communications Conference
- 8. Service activities (within and outside of the institution) ECE Faculty Search Committee, ECE Ph.D. Exam Committee; 2008-present Editor, IEEE Transactions on Wireless Communications; 2010-present Editor, IEEE Wireless Communications magazine; Reviewer for several publications; 2006,2007,2010,20011 Chair, IEEE Gainesville Section; 2010 Technical Program Committee Chair, IEEE Military Communications Conference, Unclassified Program; 2007-2009 Steering Committee Member, IEEE Military Communications Conference; Technical Program Committee: Member 2010 IEEE Global Communications Conference - Communications Theory Symposium, 2010 IEEE International Conference on Communications - Signal Processing for Communications Symposium, 2009 IEEE International Conference on Communications - Wireless Communications Symposium, 2008 IEEE International Conference on Communications - Cooperative Networks Workshop, 2007 IEEE Global Communications Conference Wireless - Communications Symposium
- Briefly list the most important publications and presentations from the past five years "Distance-based node activation for geographic transmissions in fading channels," T. D. Goswami, J. M. Shea, M. Rao, and J. Glover, *IEEE Trans. Commun.*, vol. 58, pp. 1447– 1456, May 2010

"Source and channel coding techniques for cooperative communications," J. M. Shea, T. F. Wong, C. W. Wong, and B. Choi, *Cooperative Communications for Improved Wireless Network Transmission: Frameworks for Virtual Antenna Array Applications*, M. Uysal, Ed. IGI Global, 2009

"Secret sharing over fast-fading MIMO wiretap channels," T. F. Wong, M. Bloch, and J. M. Shea, *EURASIP J. Wireless Commun. and Networking*, vol. 2009, article ID 506973, 17 pages, 2009

"Hard- and soft-output trellis-based conflict resolution for bidirectional decision feedback equalization," C. W. Wong and J. M. Shea, *IEEE Trans. Wireless Commun.*, vol. 8, no. 7, pp. 3780–3788, July 2009

"An EM approach to multiple-access interference mitigation in asynchronous slow FHSS systems," X. Tan and J. M. Shea, *IEEE Trans. Wireless Commun.*, vol. 7, no. 7, pp. 2661–2670, July 2008

"Hyper-trellis decoding of pixel-domain Wyner-Ziv video coding," A. Avudainayagam, J. M. Shea, and D. Wu, *IEEE Trans. Circuits and Syst. for Video Technol.*, vol. 18, no. 5, pp. 557–568, May 2008

"Cooperative diversity slotted ALOHA," W.-H. Wong, J. M. Shea, and T. F. Wong, *Wireless Networks*, vol. 13, pp. 361–369, June 2007

 Briefly list the most recent professional development activities – Participated in many conferences, including IEEE Military Communications Conference, IEEE Global Communications Conference, IEEE International Conference on Communications, Annual Conference on Information Sciences and Systems, Allerton Conference on Communication, Control, and Computing

# 1. Name – **RAMAKANT SRIVASTAVA**

- 2. Education PhD, Physics, Indiana University, 1973; MS, Physics, Indiana University, 1969; BS, Physics, Agra University, 1961
- Academic experience –Electrical & Computer Engineering, University of Florida, Professor Emeritus, 2010-date, part time; Electrical & Computer Engineering, University of Florida, Professor, 1990-2010, full time; Electrical & Computer Engineering, University of Florida, Associate Professor, 1985-1990, full time
- 4. Non-academic experience None
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Optical Society of America
- Honors and awards Fulbright Lecture/Research Award, 2001; Fellow, Optical Society of America, 1999; UF Teacher of the Year, 1994; Outstanding Undergraduate Instructor Award, Department of Electrical Engineering, 1994; State of Florida Teaching Incentive Program (TIP) Award, 1993; Florida Blue Key Distinguished Faculty Award, 1991
- 8. Service activities (within and outside of the institution) Served on various committees in the College and in the Department: Curriculum Committee, ABET Committee, various course committees, Awards Committee; UNDP Visiting Scientist, Research & Development Center, Telebras, Campinas (Brazil); UNDP Visiting Scientist, Indian Institute of Technology, New Delhi, India; Guest worker in the Optical Electronic Metrology Group in the Electromagnetic Technology Division, National Bureau of Standards Boulder Laboratories. Research on single-mode optical fiber characterization techniques
- 9. Briefly list the most important publications and presentations from the past five years None
- 10. Briefly list the most recent professional development activities None

## 1. Name – GREGORY STITT

- Education PhD, CSC, University of California-Riverside, 2007; BS, CSC, University of California-Riverside, 2000
- 3. Academic experience Electrical & Computer Engineering, University of Florida, full time, 2007-date, full time
- 4. Non-academic experience None
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electrical and Electronic Engineering, Association of Computing Machinery
- 7. Honors and awards Invited speaker at NSF Workshop on Interdisciplinary Challenges Beyond the Scaling Limits of Moore's Law, August 2010
- 8. Service activities (within and outside of the institution) Course development (EEL5934/4930 Reconfigurable Computing); PhD Exam Committee; Program committee of The 19th Annual IEEE International Symposium on Field-Programmable; Custom Computing Machines (FCCM); Program committee of the IEEE/ACM The International Conference on Hardware-Software Codesign and System Synthesis (CODES/ISSS); Cochair of the International Conference on Engineering of Reconfigurable Systems and Algorithms (ERSA); Reviewer for the IEEE/ACM Design Automation Conference (DAC); Reviewer for Springer Design Automation for Embedded Systems (DAES); Reviewer for ACM Transactions on Design Automation of Electronic Systems (TODAES); Reviewer for IEEE Embedded Systems Letters (ESL); Reviewer for IEEE Transactions on Very Large Scale Integration Systems (TVLSI); Reviewer for ACM Transactions on Embedded Computing Systems (TECS); Reviewer for Journal of Computer Science and Technology (JCST); Reviewer for ACM International Conference on Compilers, Architectures, and Synthesis of Embedded Systems (CASES)
- 9. Briefly list the most important publications and presentations from the past five years "Novo-G: at the forefront of scalable reconfigurable supercomputing," George, A., Lam, H., and Stitt, G., *IEEE Computing in Science and Engineering Magazine*, Jan/Feb 2011.

"RCML: An environment for estimation modeling of reconfigurable computing systems," Reardon, C., Holland, B., George, A., Stitt, G., and Lam, H., *ACM Transactions on Embedded Computing Systems Special Issue on Configurable Computing: Configuring Algorithms, Processes and Architecture CAPA'09.* 2010.

"Warp processing: Dynamic translation of binaries to FPGA circuits," Vahid, F., Stitt. G., and Lysecky, R., *Computer 41*, 7 July 2008, 40–46

"Intermediate fabrics: Virtual architectures for circuit portability and fast placement and routing," Coole, J., and Stitt, G., *CODES/ISSS '10: Proceedings of the IEEE/ACM/IFIP international conference on Hardware/Software codesign and system synthesis*, October 2010

"Performance modeling for multilevel communication in shmem+," Aggarwal, V., Yoon, C., George, A., Lam, H., and Stitt, G. *PGAS'10: Proceedings of the Conference on Partitioned Global Address Space Programming Model*, October 2010

"Novo-g: A view at the hpc crossroads for scientific computing," George, A., Lam, H., Pascoe, C., Lawande, A., and Stitt, G., *ERSA'10: Proceedings of the International Conference on Engineering of Reconfigurable Systems and Algorithms*, July 2010

"Scf: a device- and language-independent task coordination framework for reconfigurable, heterogeneous systems," Aggarwal, V., Garcia, R., Stitt, G., George, A., and Lam, H., *HPRCTA '09: Proceedings of the Third International Workshop on High-Performance Reconfigurable Computing Technology and Application*, November 2009, ACM, pp. 19–28

 Briefly list the most recent professional development activities – Attended various conferences including SIGPLAN conference on Languages, compilers, and tools for embedded systems

- 1. Name SCOTT THOMPSON
- 2. Education PhD, EE, University of Florida, 1992, MS, EE, University of Florida, 1988, BSEE, University of Florida, 1987
- Academic experience Electrical & Computer Engineering, University of Florida, Professor and Director of Advanced Devices and Semiconductor Processing Center, 2008-date, full time; Electrical & Computer Engineering, University of Florida, 2004-2008, full time
- 4. Non-academic experience –Intel Corporation, Director of Logic Technology, Advanced Si Process Technology development for microprocessors, 1992-2004, full time
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electrical & Electronic Engineers
- 7. Honors and awards IEEE Fellow; Intel Fellow; Best Paper, SRC TECON, 1991
- 8. Service activities (within and outside of the institution) EEE 4329 Course Committee Chair
- Briefly list the most important publications and presentations from the past five years "Comparison of uniaxial wafer bending and contact-etch-stop-liner stress induced performance enhancement on double-gate FinFETs," S. Suthram, M. M. Hussain, H. R. Harris, C. Smith, H. H. Tseng, R. Jammy, and S. E. Thompson, *IEEE Electron Device Letters*, vol. 29, pp. 480-482, 2008

"Physics of strain effects in semiconductors and metaloxide-semiconductor field-effect transistors," Y. Sun, S.E. Thompson, and T. Nishida, *Journal of Applied Physics* **101**, 104503 2007, pg.1-22

10. Briefly list the most recent professional development activities - None

### 1. Name – MAURICIO TSUGAWA

- Education PhD, ECE, University of Florida, 2009; MS, EE, Universidade de São Paulo, 2001; BSEE, Universidade de São Paulo, 1998
- 3. Academic experience –Electrical & Computer Engineering, University of Florida, Research Scientist, 2009-date, full time
- 4. Non-academic experience None
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations None
- 7. Honors and awards None
- 8. Service activities (within and outside of the institution) Reviewer for: IEEE Transactions on Parallel and Distributed Systems, International Journal of Network Management, Computer Communications - The International Journal for the Computer and Telecommunications Industry, IEEE/ACM International Symposium on Cluster, Cloud, and Grid Computing, IEEE Computer International European Conference on Parallel and Distributed Computing , Future Generation Computer Systems - The International Journal of Grid Computing and eScience, International ACM Symposium on High-Performance Parallel and Distributed Computing
- Briefly list the most important publications and presentations from the past five years "User-level Virtual Networking Mechanisms to Support Virtual Machine Migration Over Multiple Clouds," Tsugawa, Maurício; Riteau, Pierre; Matsunaga, Andréa; and Fortes, José, *IEEE International Workshop on Management of Emerging Networks and Services*, Miami, Florida, 2010, pp. 588-592

"Characterizing user-level network virtualization: performance, overheads and limits," Tsugawa, Maurício; and Fortes, José A.B., *International Journal of Network Management*, 2009

"User-level Virtual Network Support for Sky Computing," Tsugawa, Maurício; Matsunaga, Andréa; and Fortes, José A.B., *Proceedings of the 5th IEEE International Conference on e-Science*, p.72-79, December, 2009. DOI: 10.1109/e-Science.2009.19

"Sky Computing," Keahey, Katarzyna; Tsugawa, Maurício; Matsunaga, Andréa; and Fortes, José A.B., *Internet Computing, IEEE*, vol.13, no.5, pp.43-51, Sept.-Oct. 2009

"Characterizing User-level Network Virtualization: Performance, Overheads, and Limits," Tsugawa, Maurício; and Fortes, José A.B., *Proceedings of the 4th IEEE International Conference on e-Science*, p.206-213, 07-12 December, 2008.

"CloudBLAST: Combining MapReduce and Virtualization on Distributed Resources for Bioinformatics Applications," Matsunaga, Andréa; Tsugawa, Maurício; and Fortes, José A.B., *Proceedings of the 4th IEEE International Conference on e-Science*, p.222-229, 07-12 December, 2008.

"Getting on the Virtual Bus: By way of some common virtualization tools, agencies can make SOA their next stop for legacy apps," Matsunaga, Andréa; Tsugawa, Maurício; and Fortes, José A.B., *FEDTECH*, v.5, number 2, p.31-32, May 2008

10. Briefly list the most recent professional development activities - None

### 1. Name – ALLEN TURNER

- 2. Education PhD, Electrical Engineering, Purdue University, 1986; MS, Electrical Engineering, University of South Florida, 1980; BSEE, University of South Florida, 1977
- Academic experience Electrical & Computer Engineering, University of Florida, Lecturer, 2011-date, full time; Agricultural & Biological Engineering, University of Florida, Lecturer, 2003-2010, full time; Clemson University, Associate Professor, 1993-1996, full time; Clemson University, Assistant Professor, 1986-1993, full time
- 4. Non-academic experience 2001-2003, Lockheed Martin Naval Electronics and Surveillance Systems, Rail Systems Architect, full time, wireless technologies that LM could utilize in their train control and defense projects; GeoFocus, Director of Engineering, 1996-2001, full time, Lead team that designed, developed and implemented tracking and data acquisition systems utilizing GPS and wireless technologies; Wright-Patterson Air Force Base, Consultant, 1987-1988, part-time, Developed and implemented a computer control system for a 5MW power supply; Senior Engineer, Trak Microwave, Involved in microwave amplifier design, mechanical design, parts procurement, component assessment, manufacturing, contract bids and computer programming
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electrical and Electronic Engineers.
- Honors and awards 1995 Lewis T. Fitch Award for Excellence in Teaching, 1996 Lewis T. Fitch Award for Excellence in Teaching
- 8. Service activities (within and outside of the institution) None
- 9. Briefly list the most important publications and presentations from the past five years None
- 10. Briefly list the most recent professional development activities None

- 1. Name MARTIN A. UMAN
- 2. Education PhD, Princeton University, 1961; MA, Princeton University, 1959; BSEE, Princeton University, 1957
- Academic experience Electrical & Computer Engineering, University of Florida, Distinguished Professor, 2003-date, full time; Electrical & Computer Engineering, University of Florida, Professor and Chair, 1991-2003, full time; Electrical & Computer Engineering, University of Florida, Professor, 1971-1991, full time; Electrical Engineering, University of Arizona, Associate Professor, 1961-1965, Tucson, AZ
- 4. Non-academic experience Westinghouse Research Labs, Pittsburgh, PA, Fellow Physicist, 1965-1971, full time
- 5. Certifications or professional registrations None
- Current membership in professional organizations Fellow, American Geophysical Union, Fellow, American Meteorological Society, Life Fellow, Institute of Electrical and Electronic Engineers
- 7. Honors and awards 2010 International Conference on Lightning Protection Karl Berger Award; 2001 American Geophysical Union John Adam Fleming Medal; 2001 IEEE Power Engineering Society Surge Protective Devices Committee Prize Paper Award; 1999 IEEE Power Engineering Society Working Group Award for Standard or Guide; 1998 University of Florida, Professorial Excellence Program Award; 1996 IEEE Heinrich Hertz Medal, Gold; 1990 Florida Academy of Sciences, Outstanding Florida Scientist, Gold Medal; 1988 UF Teacher-Scholar of the Year; Fellow, American Meteorological Society; Fellow, Institute of Electrical and Electronic Engineers; Who's Who in America
- Service activities (within and outside of the institution) Departmental Faculty Search Committee 2009-2010; Search Committee for Dean of College of Engineering 2008; Faculty Development Committee 2007-2008, Sabbatical and Professional Development Leave Program Selection Committee, 2004 - date; Search Committee for the Intel Chair Search, 2004-date; Departmental Personnel Board, 2003-date; Distinguished Professor Candidate Evaluation Committee 2004 – date; UF Financial Resources Committee, June 1991-date
- 9. Briefly list the most important publications and presentations from the past five years Book: The Art and Science of Lightning Protection, Cambridge University Press, 2008

"Observations of Stepping Mechanisms in a Rocket-and-Wire Triggered Lightning Flash," C. J. Biagi, M. A. Uman, J. D. Hill, D. M. Jordan, V. A. Rakov, and J. Dwyer, J. *Geophys. Res.*, Vol. 115, D23215, doi:10.1029/2010JD014616, 2010

"Three-dimensional Imaging of Upward Positive Leaders in Triggered Lightning using VHF Broadband Digital Interferometers," S. Yoshida, C.J. Biagi, V. A. Rakov, J. D. Hill,

M. V. Stapleton, D. M. Jordan, M. A. Uman, T. Morimoto, T. Ushio, and Z.I. Kawasaki *Geophysical Research Letters*, Vol. 37, L05805, doi:10.1029/2009GL042065,2010

"RF and X-ray Source Locations during the Lightning Attachment Process," J. Howard, M. A. Uman, C. Biagi, D. Hill, J. Jerauld, V. A. Rakov, J. Dwyer, Z. Saleh, and H. Rassoul, *J. Geophys. Res.*, Vol. 115, D06204, doi:10.1029/2009JD012055, 2010,

"Estimation of the Fluence of High-energy Electron Bursts Produced by Thunderclouds and the Resulting Radiation Doses Received in Aircraft," J. R. Dwyer, D. M. Smith, M. A. Uman, Z. Saleh, B. Grefenstette, B. Hazelton and H. K. Rassoul, *J. Geophys. Res.*, Vol. 115, D09206, doi:10.1029/2009JD012039,2010

"Return Stroke Peak Current versus Charge Transfer in Rocket-Triggered Lightning," J. Schoene, M. A. Uman, and V. A. Rakov, *J. Geophys. Res.*, Vol. 115, D12107. doi:10.1029/2009JD013066, 2010

"High-speed Video Observations of Rocket-and-Wire Initiated Lightning, C. J. Biagi, D. M. Jordan, M. A. Uman, J. D. Hill, W. H.Beasley, and J. Howard, *Geophys. Res. Let.*, Vol.36, L15801, doi:10.1029/2009GL038525, 2009

Lightning Currents Flowing in the Soil and Entering a Test Power Distribution Line via its Grounding," J. Schoene, M.A. Uman, V.A. Rakov, J. Jerauld, K. J.Rambo, D. M. Jordan, G. H. Schnetzer, M. Paolone, C.A. Nucci, E. Petrache, and F. Rachidi, *IEEE Transactions on Power Delivery*, Vol. 24, 1095-1103, 2009 doi:10.1109/TPWRD.2009. 2014031

Remote Measurements of Thundercloud Electrostatic Fields, J. R. Dwyer, M. A. Uman, and H. K. Rassoul, *J. Geophys. Res.*, Vol. 114, D09208, doi:10.1029/2008JD01113862, 2009

 Briefly list the most recent professional development activities – Attended Asia-Pacific Symposium on Electromagnetic Compatability, Beijing, China; AGU Chapman Conference on the Effects of Thunderstorms and Lightning in the Upper Atmosphere; International Conference on High Voltage Engineering and Application; International Conference on Lightning Protection

- 1. Name **ANT URAL**
- Education PhD, EE, Stanford University, 2001; MS, EE, Stanford University, 1997; BSE, EE and Engineering Physics, Princeton University, 1995
- 3. Academic experience Electrical & Computer Engineering, University of Florida, Associate Professor, 2010-date, full time; Electrical & Computer Engineering, University of Florida, Assistant Professor, 2003-2010, full time
- 4. Non-academic experience None
- 5. Certifications or professional registrations None
- Current membership in professional organizations Institute of Electrical & Electronic Engineers, Materials Research Society, The Electrochemical Society, American Physical Society
- 7. Honors and awards 2006-Junior Faculty Development Award, Southeastern Center for Electrical Engineering Education
- 8. Service activities (within and outside of the institution) Reviewer for University of Florida Research and Graduate Programs Research Opportunity Incentive Fund; Member of Graduate Admissions and Aid Committee; Member of several course development committees; Referee for journals including Physical Review Letters Physical Review B, EPL, Applied Physics Letters, Journal of Applied Physics, Nanotechnology Nanoscale, Semiconductor Science and Technology New Journal of Physics, Current Applied Physics, Critical Reviews in Solid State and Material Sciences, and Carbon; Referee for Materials Research Society Proceedings; Referee for proposals for American Chemical Society Petroleum Research Fund
- Briefly list the most important publications and presentations from the past five years "Electronic properties of metal-semiconductor and metal-oxide-semiconductor structures composed of carbon nanotube film on silicon," A. Behnam, N. Arkali Radhakrishna, Z. Wu, and Ant Ural, *Applied Physics Letters* 97, 233105 (2010)

"Temperature-dependent transport and 1/*f* noise mechanisms in single-walled carbon nanotube films," A. Behnam, A. Biswas, G. Bosman, and Ant Ural, *Physical Review B* 81, 125407 (2010)

"A computational study of tunneling-percolation electrical transport in graphene-based nanocomposites," J. Hicks, A. Behnam, and Ant Ural, *Applied Physics Letters* 95, 213103 (2009).

"Resistivity in percolation networks of one dimensional elements with a length distribution," J. Hicks, A. Behnam, and Ant Ural, *Physical Review E* 79, 012102 (2009).

"Patterned growth of silicon oxide nanowires from iron ion implanted SiO<sub>2</sub> substrates," Y. Choi, J. L. Johnson, and Ant Ural, *Nanotechnology* 20, 135307 (2009)

"Percolation scaling of 1/*f* noise in single-walled carbon nanotube films," A. Behnam, G. Bosman, and Ant Ural, *Physical Review B* 78, 085431 (2008)

"Experimental characterization of single-walled carbon nanotube film-Si Schottky contacts using metal-semiconductor-metal structures," A. Behnam, J. L. Johnson, Y. Choi, M. G. Ertosun, A. K. Okyay, P. Kapur, K. C. Saraswat, and Ant Ural, *Applied Physics Letters* 92, 243116 (2008)

"GaN nanowire and  $Ga_2O_3$  nanowire and nanoribbon growth from ion implanted iron catalyst," J. L. Johnson, Y. Choi, and Ant Ural, *Journal of Vacuum Science and Technology B* 26, 1841 (2008)

 Briefly list the most recent professional development activities – Attended various conferences including the Nanoelectronic Devices for Defense and Security Conference, Nanoelectronic Devices for Defense and Security Conference, Nanoelectronic Devices for Defense and Security Conference, Device Research Conference; IEEE Conference on Nanotechnology

- 1. Name TAN F. WONG
- 2. Education PhD, ECE, Purdue University, 1997; MSEE, Purdue University, 1992; BS, EE, The Chinese University of Hong Kong, 1991
- Academic experience Electrical & Computer Engineering, University of Florida, Professor, 2009-date, full time; Electrical & Computer Engineering, University of Florida, Associate Professor, 2004-2009, full time; Electrical & Computer Engineering, University of Florida, Assistant Professor, 1998-2004, full time
- 4. Non-academic experience Consultant, Extemporal Wireless, Gainesville, Florida, 2005-2006, part time; Consultant, Intellon Corporation, Ocala, Florida, 1992-2002, part time; Globespan, Inc., Red Bank, New Jersey, 2000-2001, part time; Research Engineer, Department of Electronics, Macquarie University, High-speed wireless LAN group (in conjunction with Australian Commonwealth Scientific and Industrial Research Organization) Sydney, Australia, 1993-1995, full time.
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electrical & Electronic Engineers
- 7. Honors and awards 2003-IEEE Senior Member; 2000-Oak Ridge Associated Universities Ralph E. Power Junior Faculty Enhancement Award
- Service activities (within and outside of the institution) Departmental ABET Committee, Curriculum Committee, Budget Committee, Faculty Search; 2009-date Associate Editor, IEEE Signal Processing Letters; 2002-2006 Editor, Wideband & Multiple Access Wiress Systems, IEEE Transactions on Communications; 2002-2006 Editor-in-Chief, IEEE Transactions on Vehicular Technology; 2005-2010 Associate Editor, Journal of Wireless Communications & Mobile Computing; International Advisory Committee Member, Advanced Electronic Communications: Research & Education, Hellenic Aerospace Industry, Greece, 5/04–date; Member of Technical Program Committee for the IEEE Military Communications Conference (MILCOM '10), San Jose, CA, Nov. 2010; Member of Technical Program Committee for the IEEE International Conference on Communications (ICC '10) Wireless Communication Symposium, Cape Town, South Africa, May 2010
- Briefly list the most important publications and presentations from the past five years "Cooperative transmission in a wireless cluster based on flow management," D. Chatterjee, T. F. Wong, and T. M. Lok, *IEEE Transactions on Communications*, Oct. 2010

"Pricing Games for Distributed Cooperative Transmission," C.-Y. Ng, T. M. Lok, and T. F. Wong, *IEEE Transactions on Vehicular Technology*, vol. 59, no. 7, pp. 3393–3406, Sep. 2010

"Secret sharing over fast-fading MIMO wireless channels," T. F. Wong, M. Bloch, and J. M. Shea, *EURASIP Journal on Wireless Communications and Networking*, Special Issue on Wireless Physical Layer Security, Sep. 2009

"Power-minimizing Rate Allocation in Cooperative Uplink Systems," W. P. Tam, T. M. Lok, and T. F. Wong, *IEEE Transactions on Vehicular Technology*, vol. 59, no. 9, pp. 4919–4929, Nov. 2009

"Restricted Risk Bayes Linear State Estimation," Y. Levinbook and T. F. Wong, *IEEE Transactions on Information Theory*, vol. 55, no. 10, pp. 4761–4776, Oct. 2009

"Feedback-Assisted MAC Protocol for Real Time Traffics in High Rate Wireless Personal Area Networks," B.-S. Kim, S. Kim, Y. Fang, and T. F. Wong, *ACM Wireless Networks*, June 2009

"Flow optimization in parallel relay networks with cooperative relaying," W. P. Tam, T. M. Lok, and T. F. Wong, *IEEE Transactions on Wireless Communications*, vol. 8, no. 1, pp. 278–287, Jan. 2009

"State estimation with initial state uncertainty," Y. Levinbook and T. F. Wong, *IEEE Transactions on Information Theory*, vol. 54, no. 1, pp. 235–254, Jan. 2008

"Performance Analysis for Collaborative Decoding with Least- Reliable-Bit Exchange on AWGN Channels," X. Li, T. F. Wong, and J. M. Shea, *IEEE Transactions on Communications*, vol. 56, no. 1, pp. 58–69, Jan. 2008

 Briefly list the most recent professional development activities – Attended various conferences including the IEEE Military Communications Conference, IEEE International Conference on Communications; IEEE Global Communications Conference; and International Communications and Networking Conference

- 1. Name **DAPENG "OLIVER" WU**
- Education PhD, ECE, Carnegie Mellon University, 2003; ME, EE, Beijing University of Posts & Telecommunications, 1997; BE, EE, Huazhong University of Science & Technology, 1990
- 3. Academic experience –Electrical & Computer Engineering, University of Florida, Associate Professor, 2008-date, full time; Electrical & Computer Engineering, University of Florida, Assistant Professor, 2003-2008, full time
- 4. Non-academic experience R&D Engineer, China Posts & Telecommunications Industry Corporation, Ministry of Posts & Telecommunications, P. R. China, 1990-1994, full time
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electrical & Electronic Engineers
- Honors and awards 2009-UF Research Foundation Professorship Award; 2009 Outstanding Associate Editor, IEEE Transactions on Circuits & Systems for Video Technology; 2008-ONR Young Investigator Program Award; 2007-NSF Faculty Early Career Development Award; 2001-IEEE CSVT Transactions Best Paper Award; 2000-Certificate of Appreciation, IEEE International Symposium on PIMRC
- 8. Service activities (within and outside of the institution) Member of the steering committee for strategic planning for the information technology research area, College of Engineering, University of Florida Oct. 2009-date; Mentor, University Minority Mentor Program, University of Florida Aug. 2008–July 2009; Mentor, Student Science Training Program (for high school students), University of Florida May 2008–Aug. 2008; Member of Search Committee for Associate Dean for Research and Graduate Programs, College of Engineering, University of Florida 2008; Member of Graduate Recruiting and Admissions Committee 2007-date; Member of ABET Committee for EGN 1935 (ECE Adventures) Aug. 2007–date; Member of ABET Committee for EEL 3112 (Circuits 2) Aug. 2004-date; Member of Awards Committee Aug. 2004-date; Member of Faculty Search Committee 2005–2006; Member of Graduate Admissions and Aid Committee 2003–2004; Founding Editor-in-Chief for Journal of Advances in Multimedia 2006– 2008; Associate Editor for IEEE Transactions on Wireless Communications 2006-date; Associate Editor for IEEE Transactions on Circuits and Systems for Video Technology 2006–date; Associate Editor for IEEE Transactions on Vehicular Technology 2004– 2007; Associate Editor for International Journal of Ad Hoc and Ubiquitous Computing, INDERSCIENCE, 2004-date; Guest Editor for Journal of Visual Communication and Image Representation (JVCI), Special Issue on Network Technologies for Emerging Broadband Multimedia Services, 2008; Member, EDICS committee for IEEE Transactions on Circuits and Systems for Video Technology 2007-date; Technical Program Committee Chair for IEEE INFOCOM 2012, Orlando, FL, USA, March 25-March 30, 2012; Publicity Chair, IEEE Workshop on Signal Processing Advances in
Wireless Communications (SPAWC 2011), 2011; Area Chair for IEEE INFOCOM 2011, Shanghai, China, April 10–15, 2011; General Chair for IEEE International Conference on Multimedia and Expo (ICME) 2009,Workshop on Emerging Technology in Multimedia Communication and Networking, New York City, NY, USA, June 28 - July 3, 2009; due to restriction in space, only the last 4 years of activities have been listed

9. Briefly list the most important publications and presentations from the past five years – "Prediction of Transmission Distortion for Wireless Video Communication: Algorithm and Application," Z. Chen, D. Wu, *Journal of Visual Communication and Image Representation*, vol. 21, no. 8, pp. 948--964, November 2010

"Energy Efficient Optimal Opportunistic Forwarding for Delay Tolerant Networks," Li, D. Peng, L. Su, L. Zeng, D. Wu, *IEEE Transactions on Vehicular Technology*, vol. 59, no. 9, pp. 4500--4512, November 2010

"Image Denoising by Bounded Block Matching and 3D Filtering," Q. Chen and D. Wu, *Signal Processing*, vol. 90, no. 9, pp. 2778-2783, September 2010

"Directional Medium Access Control for Ad Hoc Networks," J. Wang, H. Zhai, P. Li, Y. Fang, and D. Wu, *ACM Wireless Networks*, vol. 15, no. 8, pp. 1059--1073, November 2009

"Feature Extraction through Local Learning," Y. Sun, D. Wu, *Statistical Analysis and Data Mining*, vol. 2, no. 1, pp. 34--47, July 2009

"TrustStream: A Secure and Scalable Architecture for Large-scale Internet Media Streaming," H. Yin, C. Lin, Q. Zhang, Z. Chen, and D. Wu, *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 18, no. 12, pp. 1692--1702, December 2008

"Linear Rate Control and Optimum Statistical Multiplexing for H.264 Video Broadcast," Z. He and D. Wu, *IEEE Transactions on Multimedia*, vol. 10, no. 7, pp. 1237--1249, November 2008

 Briefly list the most recent professional development activities – Attended various conferences including SPIE Defense & Security Symposium; IEEE International Conference on Communications; SIAM International Conference on Data Mining; IEEE Global Telecommunications Conference

#### 1. Name – WENHSING WU

- 2. Education MS, EE, University of California-Los Angeles, 1991; BS, Electrophysics, National Chiao Tung University, 1988
- Academic experience Electrical & Computer Engineering, University of Florida, Lecturer, 2006-date, part time; Electrical & Computer Engineering, University of Florida, Assistant in Engineering, 2003-2006, full time
- 4. Non-academic experience Voice Quality Test Engineer, Lucent Technologies, Mobility Solutions, Whippany, NJ, Performed test and analysis of voice quality of the VOCODER in wireless communication network systems, 2000-2003, full time; Test Engineer, AT&T/Lucent Technologies, Network Wireless Systems, Mt. Olive, NJ, Improve the yield and reduce the test time for functional test of circuit pack (TN1703 Synchronized Clock and Tone, SCT) for CDMA Minicell/Series II base stations. Participate in the design of new products; 1997-2000, full time; FMA/Supplier Quality Engineer, AT&T/Lucent Technologies, Network Wireless Systems, Mt. Olive, NJ, Analyzed failure mechanism in circuit board or system level. Generated failure analysis reports and emails to share the information amount engineers; Initiated feedback mechanisms both in the manufacturing area and to various power amplifier suppliers, to identify root cause of quality problems, 1995-1997, full time; Failure Analysis Engineer, Silicon Systems Inc., Tustin, CA, Performed failure analysis on bipolar/CMOS/BiCMOS analog and digital ICs to identify the specific mechanism causing individual reliability test failures; Installed test systems; Performed circuit analysis and diagnosed, navigated through integrated circuits, 1992-1995, full time; IC Product Engineer, Electronic Research and Service Organization, Industrial Technology Research Institute, Hsinchu, Taiwan, 1988-1989, full time
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations None
- 7. Honors and awards None
- 8. Service activities (within and outside of the institution) None
- Briefly list the most important publications and presentations from the past five years "Circular and rectangular via holes formed in SiC via using ArF based UV excimer laser." L. Liu, C.Y,Chang, Wenhsing Wu, S.J. Pearton, F. Ren, *Journal*, Vol. 257 Issue 6, pp. 2303-2307. 2010

"UV excimer laser drilled high aspect ratio submicron via hole," K.H. Chen, Wenhsing Wu, Byung Hwan Chu, C.Y. Chang, Jenshan Lin, S.J. Pearton, D. P. Norton, F. Ren, *Applied Surface Science Journal*, Vol. 256 No. 1, pp. 183-186. 2009

10. Briefly list the most recent professional development activities - None

#### 1. Name – HUIKAI XIE

- Education PhD, ECE, Carnegie Mellon University, 2002, MS, EE, Tufts University, 1998, MS, EE, Beijing Institute of Technology, 1992; BS, EE, Beijing Institute of Technology, 1989
- Academic experience –Electrical & Computer Engineering, University of Florida, Associate Professor, 2007-date, full time; Peking University, Beijing, China, Guest Professor, 2007-date, part time; Biomedical Engineering, University of Florida, Affiliate faculty, 2005-date, part time; Member, UF Shands Cancer Center, 2005-date, part time; Electrical & Computer Engineering, University of Florida, Assistant Professor, 2002-2007, full time; Lecturer, Institute of Microelectronics, Tsinghua University, Beijing, China, 1995-1996, full time; Research faculty, Institute of Microelectronics, Tsinghua University, Beijing, China, 1992-1996, full time
- 4. Non-academic experience Founder & President, WiOptix, Inc., Gainesville, Florida, 2008-date, part time; Technical Consultant, Senodia Technologies, Inc., Shanghai, China, 2008-date, part time; Member, Moffit Cancer Center, Tampa, Florida, 2009-date, part time; Akustica, Inc., Pittsburgh, PA, Director of Engineering, 2002, full time; Research and Technology Center, Robert Bosch Corporation, Palo Alto, CA, Consultant, 2000-2002, part time; Research and Technology Center, Robert Bosch Corporation, Palo Alto, CA, Summer Intern, 2001, full time
- 5. Certifications or professional registrations None
- Current membership in professional organizations American Society of Engineering Education; International Society for Optical Engineering; Optical Society of America; Senior Member, the Institute of Electrical and Electronics Engineers
- Honors and awards 2010-APEC Best Poster Award; 2009-Air Force Summerm Faculty Fellow; 2008-Best Paper fnalist, IEEE NEMS; 2007-HKN & IEEE Gainesville, Professor Appreciation Award; 2007-Marquis Who's Who in America; 2006-Small Times® magazine Best of Small Tech Researcher of the Year Finalist
- 8. Service activities (within and outside of the institution) 2003-date Departmental Graduate Admission and Aid Committee, Editorial board member, International Journal of Optomechatronics (June 2009-present); Editorial board member, Journal of Mechanics and MEMS (January 2010-present); Editorial advisory board member, The Open Information Science Journal (January 2009–present); Editorial Board member, Active and Passive Electronic Components (January 2010–present); Editor, Book series by HEP-Springer: Advances in Materials and Mechanics (January 2010–present); Section editor, Encyclopedia of Nanotechnology, Springer (April 2010–present). Technical Program Committee Member for International Conferences: IEEE Transducers 2011; IEEE Optical MEMS and Nanophotonics 2009-2011; IEEE Sensors 2010; The International Conference on Solid-State and Integrated-Circuit Technology, 2008, 2010; SPIE Photonics West, MOEMS-MEMS 2007-2009; IASTED International Conference on

Nanotechnology and Applications, 2008-2010; IASTED International Conference on Circuits, Signals, and Systems, 2004-2010

 Briefly list the most important publications and presentations from the past five years – "A Tip-Tilt-Piston Micromirror Array for Optical Phased Array Applications," L. Wu, S. Dooley, E. Watson, P. McManamon, and H. Xie, *IEEE/ASME Journal of MEMS*, vol. 19, no. 6, pp. 1450 – 1461 (2010)

"3D In Vivo optical coherence tomography based on a low-voltage, large-scan-range 2D MEMS mirror," J. Sun, S. Guo, L. Wu, L. Liu, S.-W. Choe, B. S. Sorg, and H. Xie, *Optics Express*, vol. 18, 12065-12075 (2010)

"Distributed and lumped element models for a bimorph-actuated micromirror," S. Pal and H. Xie, *Journal of Micromechanics & Microengineering*, vol. 20, 045020 (2010).

"An electrothermal tip-tilt-piston micromirror based on folded dual s-shaped bimorphs," K. Jia, S. Pal, H. Xie, *J. of Microelectromechanical Systems*, vol. 18, pp. 1004-1015 (2009).

"A Monolithic CMOS-MEMS 3-axis Accelerometer with a Low-noise, Low-power Dualchopper Amplifier, H. Qu, D. Fang, H. Xie," *IEEE Sensors J.*, vol. 8, pp. 1511-1518 (2008).

 Briefly list the most recent professional development activities – Attended various conferences including Applied Power Electronics Conference and Exposition; International Conference on Microelectromechanical Systems; Asia Communications and Photonics Conference and Exhibition; Nanoelectronic Devices for Defense & Security Conference

#### 1. Name – YONG-KYU YOON

- Education PhD, ECE, Georgia Institute of Technology, 2004; MS, ECE, New Jersey Institute of Technology, 1999; MS, EE, Seoul National University, 1994; BS, Seoul National University, 1992
- 3. Academic experience –Department of Electrical and Computer Engineering, University of Florida, Gainesville, Florida, Associate Professor, 2010-date, full time; Department of Electrical Engineering, Stony Brook University, The State University of New York, Stony Brook, New York, Visiting Assistant Professor, 2007, full time; Department of Electrical Engineering, University at Buffalo, The State University of New York, Buffalo, New York, Assistant Professor, 2006-2010, full time
- 4. Non-academic experience Staff Engineer for VLSI and MEMS design, Microsystems, Newark, New Jersey, 1998-1999, full time
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electrical & Electronic Engineers
- 7. Honors and awards 2009-Young Investigator Award, University of Buffalo; 2008-Faculty Early Career Development (CAREER) Award, National Science Foundation; 2007-Best Poster Paper, The 57th ECTC Conference; 2006 Award of Excellence in Graduate Polymer Science Research, the 231<sup>st</sup> American Chemical Society; 2003-Student Paper Contest Award (2<sup>nd</sup> Place), IEEE International Microwave Symposium; 2003-Student Poster Competition Award (2<sup>nd</sup> Place), Industrial Advisory Board Meeting at Georgia Tech Packaging Research Center
- 8. Service activities (within and outside of the institution) 2010-date Departmental Curriculum Committee; 2007-date IEEE Buffalo section board member; 2007-date Referee, IOP Nanotechnology; 2005-date Adjudicator and referee, Journal of Micromechanics and Microengineering; 2006-date Referee, ASME International Mechanical Engineering Congress and Exposition (IMECE); 2007-date Reviewer, IEEE Transaction on Automation Science and Engineering; 2008-date Reviewer, IEEE Sensors Journal; 2009-date Reviewer, IEEE Journal of Microelectromechanical Systems (JMEMS); 2009-date Reviewer, IEEE Journal of Selected Topics in Quantum Electronics; 2009-date Reviewer, IOP Journal of Physics D; 2007-NSF Panelist and reviewer, National Science Foundation; 2009 NSF Panelist and reviewer, National Science Foundation; 2009-NSF Panelist and reviewer, National Science Foundation
- 9. Briefly list the most important publications and presentations from the past five years "Microworld: United We Stand," Jungkwun Kim and Yong-Kyu Yoon, *Lab on a Chip*, Cover image (p. 669), vol. 10, no. 6, pp. 681-682, March 21, 2010

"Fabrication and Characterization of Gold-Polymer Nanocomposite Plasmonic Nanoarrays in a Porous Alumina Template," Shobha Shukla, Kyoung Tae Kim, Alexander Baev, Yong-Kyu Yoon, Natasha Litchinitser, and Paras Prasad, *ACS Nano*, vol. 4, no. 4, pp. 2249-2255, April 2010

"An electrically active mironeedle array for electroporation," Seong-O Choi, Yeu Chun Kim, Jung-Hwan Park, Joshua Hutcheson, Harvinder S. Gill, Yong-Kyu Yoon, Mark R. Prausnitz, and Mark G. Allen, *Biomedical Microdevices*, vol. 12, no. 2, pp. 263-273, April 2010

"2.45 GHz Inter-/Intra Board Wireless Communication using a CPW-fed Vertical Bowtie Antenna," J.K. Kim, S.Y. Cha, T.S. Yun, and Y.K. Yoon, *Microwave and Optical Technology Letters*, vol. 51, no. 1, pp. 266-269, 2009

"Fabrication of Submicron Structures in Nanoparticle/Polymer Composite by Holographic Lithography and Reactive Ion Etching," A.P. Zhang, S. He, K.T. Kim, Y.-K. Yoon, R. Burzynski, M. Samoc, and P.N. Prasad, *Applied Physics Letters*, 93, 203509, 2008

 Briefly list the most recent professional development activities – International Conference of IEEE Micro Electro Mechanical Systems; American Vacuum Society's International Symposium; International Conference on Miniaturized Systems for Chemistry and Life Sciences; IEEE International Microwave Symposium

#### 1. Name – **HENRY ZMUDA**

- 2. Education PhD, EE, Cornell University, 1984; MS, EE, Cornell University, 1982; BE, Stevens Institute of Technology, 1979
- 3. Academic experience Electrical & Computer Engineering, University of Florida, Associate Professor and Undergraduate Coordinator, 2010-date, full time; Electrical & Computer Engineering, University of Florida, Associate Professor, 2006-2009, full time; Associate Professor and Program Coordinator of the Graduate Engineering & Research Center, Eglin Air Force Base, Electrical & Computer Engineering, University of Florida, 1995-2006, full time; Associate Professor, Electrical Engineering, Stevens Institute of Technology, 1988-1995, full time; Assistant Professor, Electrical Engineering, Stevens Institute of Technology, 1983-1988, full time; Electrical Engineering, Cornell University, Visiting Professor, Summer 1985, full time; Electrical Engineering, Cornell University, 1982-1984, Lecturer, full time
- 4. Non-academic experience None
- 5. Certifications or professional registrations None
- 6. Current membership in professional organizations Institute of Electrical and Electronic Engineers; Directed Energy Professional Society; IEEE Transactions on Microwave Theory and Techniques; American Society for Engineering Education; The Directed Energy Professional Society; HKN, the Electrical Engineering Honor Society, Cornell Chapter; Sigma Xi, the National Research Honor Society; Fellowship of Catholic Scholars
- 7. Honors and awards None
- 8. Service activities (within and outside of the institution) Departmental Curriculum Committee; Departmental ABET Coordinator; Ordained deacon for the Roman Catholic Church assigned to the UF Catholic Student Center
- Briefly list the most important publications and presentations from the past five years "Optical Miniaturization of a MEMS-Based Floating Element Shear Stress Sensor with Moiré Amplification," Chen, T., Mills, D., Chandrasekharan, V., Zmuda, H., and Sheplak, M., AIAA Paper 2010-0498, 48th AIAA Aerospace Sciences Meeting, January 2010

"A *MIMO-Inspired rapidly switchable photonic interconnect architecture*," H. Zmuda, J. Osman, M. Fanto and T. McEwen, SPIE Defense and Security Symposium, April 2010

"A *MIMO-Based Optical Phased Array Laser Radar System*," H. Zmuda and N. S. Sharma, SPIE Defense and Security Symposium, April 2009

*"Waveform use in incoherent radar and laser radar applications,"* R. Erdmann, J. Malowicki, M. Fanto, T. McEwen, H. Zmuda and N. Levanon, 54th Annual Tri-Service Radar Symposium, Monterey, CA, 23-27 June, 2008.

10. Briefly list the most recent professional development activities – Participated in the National Effective Teaching Institute Workshop sponsored by the American Society for Engineering Education; attended the SPIE Defense and Security Symposium and the Annual Tri-Service Radar Symposium

# **Appendix C – Equipment**

### A. CISE Departmental Equipment

See Criterion 7, Section B, for a description of computer equipment provided by the CISE department for the support of the Computer Engineering program.

## **B.** ECE Departmental Equipment

In addition to the computer equipment listed in Criterion 7, Section B, the ECE Department owns as multiple copies of the items listed below as is necessary to provide an educationally sound laboratory experience for the students.

- LPKF ProtoLaser S PCB Prototyping System with Laser
- LPKF ProtoMat S62 Circuit Board Plotter / Milling Machines
- LabVolt Electromechanical Training Systems
- Agilent Spectrum Analyzers
- Agilent Function / Waveform Generators
- Tektronix Oscilloscopes and Curve Tracers
- Agilent Mixed Signal Oscilloscopes
- Agilent Triple Output DC Power Supplies
- National Instruments ELVIS II and ELVIS Systems

## **Appendix D – Institutional Summary**

Programs are requested to provide the following information.

#### The Institution

The University of Florida, Gainesville, FL 32611

J. Bernard Machen, President, University of Florida Dr. Cammy Abernathy, Dean, College of Engineering

Office of Institutional Planning and Research University of Florida P.O. Box 113115 355 Tigert Hall Gainesville, FL 32611-3115 Phone: (352) 392-0456 Fax: (352) 392-8774 Email: ufdata@aa.ufl.edu

Organizations by which the institution is now accredited and the dates of the initial and most recent accreditation evaluations:

- The University of Florida is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools to award bachelor, master, specialist and engineer, as well as doctoral and professional degrees. The last review was in 2003. the self-study is located Α copy of on the web at: http://fora.aa.ufl.edu/Provost/Pages/2003-SACS-Steering-Committee/SACSCOCSelf-StudyCommitteeReports
- The program of study in Computer Engineering that leads to the degree of Bachelor of Science in Computer Engineering resides in the Department of Computer and Information Science and Engineering (which is responsible for ABET accreditation) and in the Department of Electrical and Computer Engineering. The program is accredited by ABET. Our last accreditation evaluation was October 2006.

#### **Type of Control**

Public, comprehensive, land-grant, research university.

#### **Educational Unit**

The Computer Engineering program is co-located in the Departments of Computer and Information Science and Engineering, and Electrical and Computer Engineering. The administrative chain of responsibility is:

- Dr. Herman Lam, ECE, Computer Engineering Program Director.
- Dr. Paul Gader, interim Chair, Department of Computer and Information Science and Engineering
- Dr. John Harris, Chair, Department of Electrical and Computer Engineering
- Dr. Cammy Abernathy, Dean, College of Engineering.
- Dr. Joseph Glover, Provost and Senior Vice President for Academic Affairs
- Dr. J. Bernard Machen, President

#### Academic Support Units

Please refer to the separate Institution Profile Volume provided for this information.

- Dr. James Keesling, Chairman, Department of Mathematics
- Dr. Michael Daniels, Chairman, Department of Statistics
- Dr. John Yelton, Chairman, Department of Physics
- Dr. Daniel R. Talham, Chairman, Department of Chemistry
- Dr. Alice Harmon, Chairman, Department of Biology

#### Non-academic Support Units

- Dr. Judith Russell Dean of University Libraries
- Dr. Fedro Zazueta, Professor & Associate CIO, UF Academic Technology Office
- Dr. Heather White, Interim Director, UF Career Resource Center

There are a number of units that support the engineering academic programs. In the college, the Office of Academic Affairs (AA) provides an overall direction for the college's curricula. The Office of Student Affairs (OSA) advises and counsels students, maintains student re- cords, and provides an interface with other supporting colleges.

Within the OSA, a variety of services is provided to students, with emphasis on freshmen and sophomores and transfer students from community colleges and other institutions. The OSA is staffed by eight (8) faculty and staff members under the direction of the Associate Dean of Student Affairs. It coordinates all student advising within the College of Engineering, and serves as liaison between academic departments within the college and with university-wide student services and facilities. The OSA is also responsible for developing and implementing other student support services including career/lifestyle counseling, success workshops, study halls, tutoring, and mentoring. The OSA informs students of available educational resources including co-op and internship opportunities, scholarships, and tuition waivers. The OSA is also engaged in programs targeted at minorities and women, pre-college outreach activities, and recruitment and retention of quality students.

The College of Engineering has established a number of programs to assist incoming students. These include:

- Successful Transition through Enhanced Preparation for Undergraduate Students (STEPUP)
- Engineering Freshman Transition Program (EFTP)
- Transfer Student Transition Program (TSTP)

EFTP provides assistance in helping students acclimate and prepare for the fall term as engineering students. It is a residential program open to all first-year engineering students. Selected students arrive on campus during the summer B session to get an opportunity to discover the campus prior to the arrival of the rest of the UF students. EFTP is comprised as an intense two-credit course offered during summer B to assist students in adjusting to the level, speed and style of college instruction in foundation courses (Calculus & Chemistry). Additionally, students also receive the following benefits:

- Orientation of Engineering resources
- Student Success Workshops
- Career Resource Center presentations
- Industry representative presentations
- Team Building Project
- Study Groups

EFTP continues throughout the fall and spring semesters of the student's first year.

Along with their regular classes, selected students spend the fall and spring semester's acclimating to the demands of being engineering students with the help of peer mentors. Mentors communicate with their assigned students each week to assist in answering questions and offering resources to help make every student successful in engineering, allowing the mentors to not only point out resources but also provide tailored support to each student.

The Management Information Systems (MIS) section of the Engineering Fiscal & Personnel Office makes available comprehensive and high quality services to meet the information technology needs of the College and its students. The office provides technical and administrative support, network services, information technology planning and many other services needed to support the college's computers and computer laboratories.

The Engineering Fiscal and Personnel Office provides support for student employment and processes fellowships, scholarships, and assistantships. The Office of Engineering Research offers research support for undergraduate and graduate students. At the university level, a number of organizations assist engineering and other students with financial aid, counseling, career planning, health-related, and other services [UF Student Support Services]

#### **Credit Unit**

The ABET self-study template states:

It is assumed that one semester or quarter credit normally represents one class hour or three laboratory hours per week. One academic year normally represents at least 28 weeks of classes, exclusive of final examinations. If other standards are used for this program, the differences should be indicated.

We concur. Each class period is normally 50 minutes each.

## Table D-1. Program Enrollment and Degree Data

	Acad	Enrollment Year					otal ndergrad	otal ad	Degrees Awarded			
	 Year	1st	2nd	3rd	4th	5th	Tc Uı	Tc Gi	Associates	Bachelors	Masters	Doctorates
2011-2012	FT	77	50	87	93	76	383	477		40	*	*
	PT											
2010-2011	FT	68	54	105	77	70	374	417		61	161	26
	PT											
2009-2010	FT	79	61	106	79	67	392	435		65	169	22
	PT											
2008-2009	FT	78	62	98	77	73	388	401		81	175	25
	PT											
2007-2008	FT	95	65	101	73	101	435	326		91	120	30
	РТ											

## **Computer Engineering**

1

Give official fall term enrollment figures (head count) for the current and preceding four academic years and undergraduate and graduate degrees conferred during each of those years. The "current" year means the academic year preceding the fall visit. (\*): data for Spring 2012 not yet available.

FT--full time

PT--part time

#### Table D-2a. Personnel: CISE

Computer Engineering

	HEAD C	$FTE^2$	
	FT	РТ	TIL
Administrative <sup>3</sup>		3	0.65
Faculty (tenure-track)	27	6	30.89
Other Faculty (excluding student Assistants)	8	1	8.48
Student Teaching Assistants	7	71	42.50
Student Research Assistants	29	46	52.00
Technicians/Specialists	5	0	5.00
Office/Clerical Employees	9	1	9.85
Others <sup>4</sup>			

Year<sup>1</sup>: Fall 2011

Report data for the program being evaluated.

- <sup>1</sup> Data on this table should be for the fall term immediately preceding the visit. Updated tables for the fall term when the ABET team is visiting are to be prepared and presented to the team when they arrive.
- <sup>2</sup> For student teaching assistants, 1 FTE equals 20 hours per week of work (or service). For undergraduate and graduate students, 1 FTE equals 15 semester credit-hours (or 24 quarter credit-hours) per term of institutional course work, meaning all courses science, humanities and social sciences, etc. For faculty members, 1 FTE equals what your institution defines as a full-time load.
- <sup>3</sup> Persons holding joint administrative/faculty positions or other combined assignments should be allocated to each category according to the fraction of the appointment assigned to that category.
- <sup>4</sup> Specify any other category considered appropriate, or leave blank.

#### Table D-2b. Personnel: ECE

Computer Engineering

	HEAD C	$FTF^2$	
	FT	PT	TIL
Administrative <sup>3</sup>			
Faculty (tenure-track)	39	0	39
Other Faculty (excluding student	9	16	17
Assistants)			
Student Teaching Assistants	37	0	37
Student Research Assistants	183	0	183
Technicians/Specialists	9	0	9
Office/Clerical Employees	25	0	25
Others <sup>4</sup>			

Year<sup>1</sup>: Fall 2011

Report data for the program being evaluated.

- <sup>2</sup> Data on this table should be for the fall term immediately preceding the visit. Updated tables for the fall term when the ABET team is visiting are to be prepared and presented to the team when they arrive.
- <sup>2</sup> For student teaching assistants, 1 FTE equals 20 hours per week of work (or service). For undergraduate and graduate students, 1 FTE equals 15 semester credit-hours (or 24 quarter credit-hours) per term of institutional course work, meaning all courses science, humanities and social sciences, etc. For faculty members, 1 FTE equals what your institution defines as a full-time load.
- <sup>3</sup> Persons holding joint administrative/faculty positions or other combined assignments should be allocated to each category according to the fraction of the appointment assigned to that category.
- <sup>4</sup> Specify any other category considered appropriate, or leave blank.

## Signature Attesting to Compliance

By signing below, I attest to the following:

That <u>Computer Engineering</u> (*Name of the program(s)*) has conducted an honest assessment of compliance and has provided a complete and accurate disclosure of timely information regarding compliance with ABET's *Criteria for Accrediting Engineering Programs* to include the General Criteria and any applicable Program Criteria, and the ABET *Accreditation Policy and Procedure Manual*.

Prof. Cammy Abernathy Dean's Name (As indicated on the RFE)

Cammy Red Signature

June 29, 2012 **Date** 

Contact Information:

Dr. Herman Lam, Director Computer Engineering Undergraduate Program 313 Benton Hall University of Florida Gainesville, FL 32611 352-392-2689 hlam@ufl.edu

CISE Department contact: Dr. Paul Gader, interim Chair Department of Computer and Information Science and Engineering E301 CSE Building University of Florida Gainesville,FL 325611-6120 352-392-1200 pgader@cise.ufl.edu

ECE Department contact: Dr. John Harris, Chair Department of Electrical and Computer Engineering 216 Larsen University of Florida Gainesville, FL 32611 352-392-0911 harris@cnel.ufl.edu



## **UF** College of Engineering UNIVERSITY of FLORIDA

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