

seeecs network

Opening Minds to New Technology



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SEECS Annual Activity Report: Highlights from May 2001 to May 2002

BY EROL GELENBE, SEECS DIRECTOR

It is a pleasure to offer this annual report on the activities of the School of Electrical Engineering and Computer Science. The past year of May 2001 to May 2002 was one of growth and accomplishments for SEECS. Our activities and achievements, summarized here, are best illustrated when shown in correlation to the University of Central Florida's Five Goals:

1. Offer the Best Undergraduate Education in Florida

Of particular note during this year was the May 2002 graduation of SEECS's first group of undergraduates with a bachelor's degree in Information Technology. Also, our students received numerous awards, scholarships and honors this year for individual as well as group accomplishments.

Last fall, the UCF Programming Team, advised by Ali Orooji, Computer Science Associate Professor, was successful again in the Southeast Regional Programming Contest, sponsored by the Association for Computing Machinery (ACM). UCF teams finished first, fourth, seventh, 15th and 17th in the regionals. In March, the first-place team competed in the ACM's

International Collegiate Programming Contest Finals. The team finished fifth in the United States and 27th in the world. Our undergraduates were distinguished in national TopCoder programming competitions as well.

A group of undergraduate and graduate Electrical Engineering students, advised by Dr. Issa Batarseh, received third place in the prestigious Future Energy Challenge Award for "Best Engineering Design." Other recipients of the award, given by the Department of Energy, included Texas A&M (first place), Virginia Tech (second place) and University of Wisconsin-Madison (fourth place).

We are pleased that SEECS remains the largest recipient of National Merit Scholars and Finalists at UCF. Of our scholars, the majority are majoring in Computer Science or Computer Engineering.

Our undergraduate education is greatly enhanced by continued participation in the successful NSF-funded project "Research Experience for Undergraduates in Computer Vision," led by Mubarak Shah, Computer Science Professor, and Niels da Vitoria Lobo, Computer Science Associate Professor. The REU project's aim is to encourage talented undergraduates into research careers. Shah and Lobo also organized a workshop in Orlando for all PIs in the REU program.

In support of our efforts to continue providing the best education possible, we actively recruited new faculty members in the Fall and Spring semesters. We are pleased with the outcome of our search, which attracted three new tenure-track faculty members in Computer Engineering and three faculty, also on tenure track, in Computer Science.

SEECS also employed six new visiting faculty in Computer Science, Electrical Engineering and Computer Engineering this past year. All of our visiting

(continued on page 2)

The SEECS Management Team (from left to right): David Workman, CS Undergraduate Advisor, Ron Dutton, CS Graduate Coordinator/Program Director, Erol Gelenbe, SEECS Director, Kalpathy Sundaram, EE Associate Professor, Zhihua Qu, EE Program Director and Michael Georgiopoulos, EE and CpE Graduate Program Coordinator (not pictured: Chris Bauer, CpE Program Director and Gerald Marin, IT Program Director).



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faculty members have received their doctoral degrees, many from top institutions.

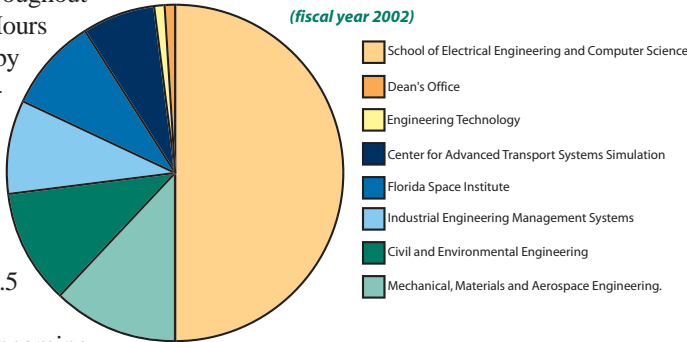
Student enrollment increased throughout the year. Total Student Credit Hours (SCH) in Computer Science grew by 10.5 percent to 39,600 in the 12 academic months of Summer '01, Fall '01 and Spring '02. During the same period, Computer Engineering SCH increased by 3.8 percent to 7,972, while Electrical Engineering SCH declined by 2.5 percent to 11,458.

We actively prepared for upcoming accreditation visits by the Accreditation Board for Engineering and Technology (ABET) and the Computing Sciences Accreditation Board (CSAB), which will take place this coming fall. If accreditation from ABET and CSAB is renewed, it would be for the next six years and would again provide an assurance of quality education from our school. Preparation for the audit has enabled us to improve laboratories, reconsider certain undergraduate courses for improvement and evaluate our program assessment methods and objectives. For example, a faculty committee has streamlined the introductory Electrical Engineering courses into a two-course sequence for majors and a single, separate course for non-majors.

To enhance the quality of our learning experience, we capped undergraduate sections in Computer Science service courses to 200 students this year. These fundamental courses run smoothly now and with full student satisfaction. The same classes attracted close to 7,000 undergraduates across all disciplines, providing many with an introduction to modern computing.

We pay tribute to Homer Gerber, Computer Science Associate Professor, and Darrell Linton, Computer Engineering Associate Professor, who decided

**Total Funded Research
College of Engineering and Computer Science:
\$11,918,537
(fiscal year 2002)**



to retire in 2002 after many years of dedicated service to our university. Also, Janusz Zalewski, Computer Engineering Associate Professor, was evaluated for tenure and left UCF to join the University of West Florida. We are grateful to them for their contributions to our community.

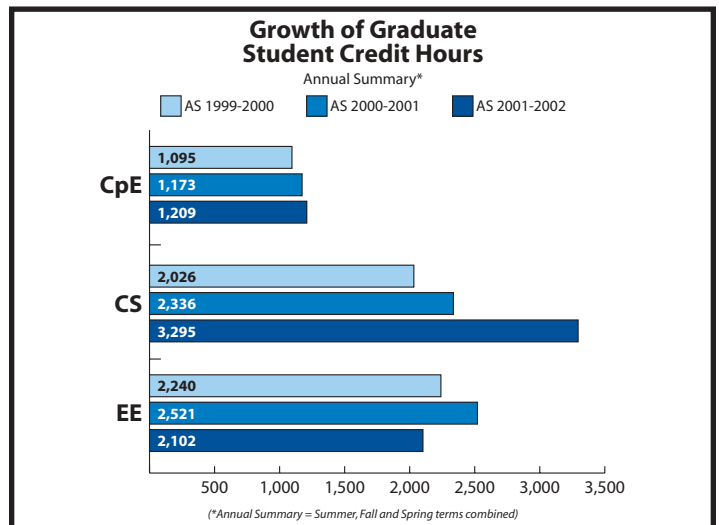
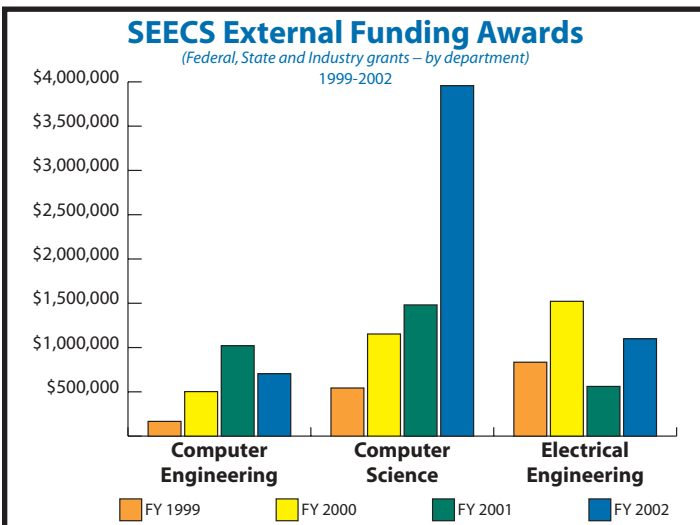
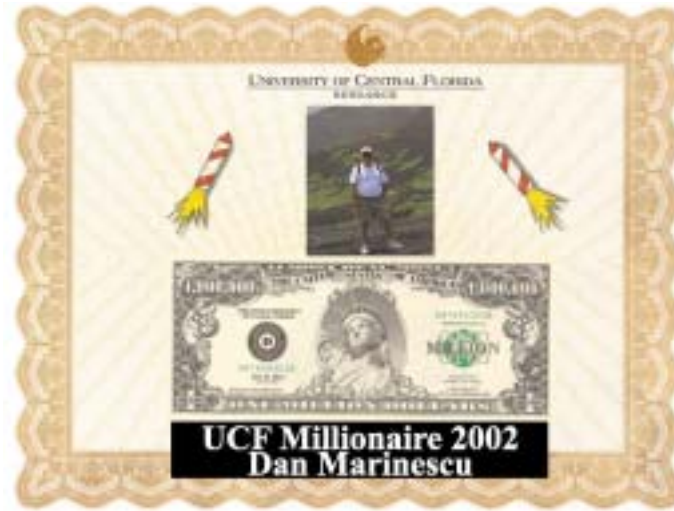
2. Achieve International Prominence in Key Graduate and Research Areas

Our graduate program and strength in funded research resulted in many accomplishments, including the following:

- Within the College of Engineering and Computer Science, SEECS grant awards amounted to \$5,950,889, representing 50 percent of grants and contracts awarded to our college.
- This year's external research grant awards in Computer Science (including federal and industry grants) doubled over the last fiscal year, reaching \$3,895,934. Over the last four years, the department's external funding has increased by 700 percent. The column chart below illustrates the external funding earned in each department.

- Our faculty received more than \$1.8 million in new grants from the National Science Foundation this year, which is the most competitive source of research funding. More than \$1.5 million of the total was awarded in Computer Science.

- Dan Marinescu, Computer Science Professor, secured \$1.1 million in funding during FY 2002. The distinction made him a member of UCF's Millionaire Club and the most-funded researcher in the College of Engineering and Computer Science. He is conducting research in computational



biology and process coordination on a computational grid.

- Additionally, four of the top five researchers in the College of Engineering and Computer Science are SEECS faculty. Erol Gelenbe was second, securing \$661,408 in research funding, Kien A. Hua, Computer Science Professor, was third with \$603,456 and Guy Schiavone, Assistant Professor of Computer Engineering, was fifth in the college, earning \$457,807. Of the 80 faculty in the college who received research grants last year, 33 (or 41 percent) were from SEECS.

- Computer Science Graduate SCH grew by more than 25 percent to 3,295 in the 12 months ended May 2002. (In the last four years, Computer Science graduate SCH has grown more than 281 percent.) During the same 12-month period, Computer Engineering graduate SCH grew by 3 percent to 1,209, while Electrical Engineering graduate SCH declined by 17 percent to 2,102.

- Erol Gelenbe received the medal of Officer of the National Order of Merit of France in Washington, DC in 2002.

3. Provide International Focus in Curricula and Research Programs

This year, students from two of France's most prestigious engineering schools, Ecole Polytechnique and the Institut National des Telecommunications, and several faculty from Thailand held internships in Computer Science. Ongoing joint exchange programs with Thai, Polish, French, German, Chinese, Swedish and Jordanian universities are being pursued.

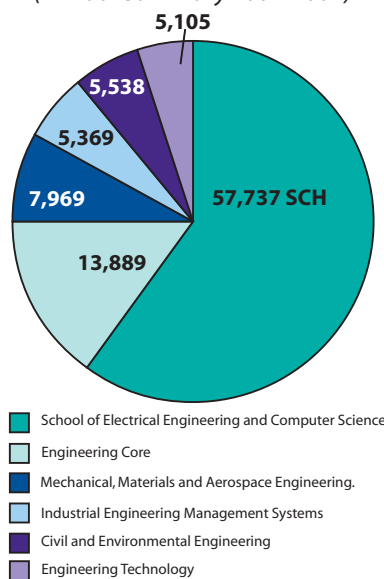
As part of our focus on curricula and research, our faculty continued to serve on the editorial boards of national and international journals including: *IEEE Transactions on Neural Networks*, *IEEE Transactions on Pattern Analysis and Machine Intelligence*,



Erol Gelenbe is presented with the medal of Officer of the National Order of Merit of France in Washington, D.C.

Total Student Credit Hours College of Engineering and Computer Science

(Annual Summary 2001-2002)



Machine Vision and Applications, Pattern Analysis, Acta Informatica, Performance Evaluation, Telecommunication Systems, Computer Communications, Journal de Recherche Operationnelle and Simulation: Practice and Theory.

Several faculty served on the program committees of conferences such as IEEE ICASSP '02, IEEE Mascots '02, Software Engineering '02, ACM/IFIP Performance '02 and SCS SPECTS '02.

4. Become More Inclusive and Diverse

SEECS is pleased to have included three minority faculty as Visiting Assistant Professors (two African Americans and one Hispanic). Two of the new Visiting Assistant Professors taught in Computer Engineering and one in Computer Science.

In addition, three women faculty members joined Computer Engineering, one as a tenure-track Assistant Professor and two as Visiting Lecturers. SEECS was fortunate to recruit a woman as Visiting Assistant Professor in Computer Science.

Two of our currently funded research projects (with ARO and NSF) include minority institutions such as FAMU, University of Houston-Downtown and Grambling State University. A workshop, organized through the NSF-funded project and hosted by PIs Ratan Guha, Computer Science Professor, Mostafa Bassiouni, Computer Science Professor, and Erol

Gelenbe, was held at SEECS for minority institutions only. Entitled "Distributed Systems and Applications: Innovative Curriculum for Undergraduate Computer Science and Engineering Students," the workshop was attended by faculty from the University of Puerto Rico, FAMU, California State University at San Bernardino, Grambling State University and University of Texas-Pan American.

5. Be America's Leading Partnership University

SEECS has remained the UCF unit with the largest number of industry-funded partnership projects. This year, joint work was conducted with Central Florida companies such as Agere Systems, Adaptec Inc., ImageSoft Technologies, GigaNet Technologies Inc., Raytheon Co., Intersil Corp., Honeywell, Boeing Co., Harris Corp., Lockheed Martin Corp., Theseus Logic Inc. and Schwartz Electro-Optics Inc. (SEO). New projects were developed with NASA's Kennedy Space Flight Center and new work, funded by U.S. Army STRICOM and Naval Air Warfare Center, was initiated.

Another highlight is the SEECS Industry Advisory Board. The IAB's mission is to create and foster a partnership between SEECS leadership and the various industries that are interested in our research and in our graduates as future employees. Many thanks to Dr. Michael Macedonia, Chair of IAB and Chief Scientist and Acting Technical Director at U.S. Army STRICOM; he has been instrumental in the success and growth of our industry projects.

We extend our thanks to the students, faculty, staff and alumni of UCF and to our administration, industry partners, friends and community for their support and generosity. It is through the dedication of so many that our School of EECS and its programs continue to thrive.



Dr. Michael Macedonia, Chair of the Industrial Advisory Board



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Computer Science Unites with ImageSoft Technologies

A world leader in document imaging solutions, ImageSoft Technologies has teamed with a research group of 11 computer science Ph.D. students led by Principle Investigator Professor Kien A. Hua. ImageSoft, a division of Fiserv, Inc., selected the team to develop an Advanced Distributed Image Management System and to leverage Dr. Hua's expertise in multimedia technologies and his extensive experience working with the industry. Dr. Hua, with his students, is widely published in multimedia databases, video communications and Internet computing.

Collaboration and research on the project began in 2000 and has been supplemented by matching funds from Florida's High Technology Corridor Program (the "I-4 Matching" program). ImageSoft provided \$100,000 in initial funding for 2000, and the team received an additional \$55,000 from the I-4 Matching program.

From the work Dr. Hua's team did in 2000, a distributed archive system product was developed, prototyped and demonstrated. The team then assisted ImageSoft in implementing a commercial version of the software. The product, known as Titan, has been tested extensively and is already in use at Union Bank of California.

Titan scans documents and automatically extracts data to facilitate information retrieval and data analysis. In the case of ImageSoft's Union Bank customer, account numbers, check numbers, dates, names, addresses, etc. are extracted from check images and maintained in a relational database system to capitalize on its efficient search mechanism. Titan stores the document images in a hierarchical storage system, and manages them separately for optimal performance and cost effectiveness. The user accesses Titan through a Distributed Archive module. This software operates atop one or more local Titans. The user sees a single logical archival system, although the data sets are physically stored at many locations.

ImageSoft funded the UCF team for 2001 and 2002 as well, providing an additional \$114,478 each year for continued research, for a total (to date) of \$328,956. For 2001, the I-4 Matching program contributed \$100,000, for a total of \$155,000 to date. It is not known yet if matching funds will be granted for 2002.

Mr. David Hodge, Vice President Titan Product Management for ImageSoft, says, "Our partnership with UCF and SEECS has been a real success story. SEECS brings lots to the table in terms of ability to use leading edge technology to provide practical solutions to busi-

ness. When we try to develop a new, unique and competitive advantage in the marketplace, and want to employ the latest in technology, we know that Dr. Hua and his students will get the work done. They've succeeded over and over again for us."

Hodge adds, "Through Dr. Hua's efforts, we not only have the features and functionality we are looking for, but we also have the performance. He and his students have a very keen appreciation for business systems and provide us with practical solutions. I fully expect this to be an ongoing relationship."

ImageSoft is extremely pleased with the partnership. "We have a very positive return on our investment in research with Dr. Hua," concludes Hodge. "And we've received definite benefits from the I-4 matching program. It would have been nearly impossible to have achieved this magnitude of success without the matching program."

"ImageSoft is a great example of a company that has benefited from the Corridor's research program," said Randy Berridge, President of the Florida High Tech Corridor Council. "Including \$25.2 million in Corridor funds and \$55 million in matching funds, this \$80 million initiative has partnered UCF and the University of South Florida with 145 corporations and institutions in more than 290 projects."

