

seecs network

OPENING MINDS TO NEW TECHNOLOGY



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Research Enriches SEecs Curriculum

Research plays a major role in universities worldwide and is rightly perceived as the fuel of innovation and economic development, especially in high-tech areas such as Electrical Engineering and Computer Science and Engineering. Thus, in the last four years, UCF's School of Electrical Engineering and Computer Science has secured more than \$20 million in research awards from industry and federal and state governments.

Erol Gelenbe, Director of SEecs, points out that research and scholarly work by the faculty and students of our school also contribute very significantly to education, at both the undergraduate and graduate levels. This transfer and interaction between research and education occurs in several ways:

- 1. Research allows our faculty to remain at the top of the profession and to provide courses that represent the absolute state-of-the-art in our rapidly changing field.**
- 2. Research enables our undergraduate students to gain hands-on experience with advanced technology through a variety of programs, such as the National Science Foundation's Research Experience for Undergraduates.**
- 3. Finally, it is through their research projects and experience that our alumni, as well as graduate and undergraduate students, can then contribute advanced methods and technologies to the IT industry in Central Florida and across the nation.**

David Workman, Computer Science Undergraduate Coordinator, says, "Students can work on a project with several scientists and educators from varied yet related fields. The research the students conduct with these professionals culminates an integration of education, research and training."

He adds, "In the end, experiences from our research projects train SEecs students to be leaders in their field."

This issue of **SEecs Network** is devoted to several projects for which SEecs received highly

competitive funding from the National Science Foundation to further interaction between research in Information Technology and education in Computer Science and Engineering and Electrical Engineering.

Introducing Fundamental Concepts and Evaluation Methods for Distributed Systems and Applications in the Computer Science Undergraduate Curriculum

Undergraduates at UCF have an opportunity to learn fundamental concepts of distributed computer systems, modern computer networks and distributed applications through inventive, new curriculum options thanks to a \$530,000 grant from NSF.

The project, Introducing Fundamental Concepts and Evaluation Methods for Distributed Systems and Applications in the CS Undergraduate Curriculum, is led by Principal Investigators Ratan Guha, Professor of Computer Science, Mostafa Bassiouni, Professor of Computer Science, and Erol Gelenbe. The objective is to stimulate revolutionary educational activities in the Computer and Information Science and Engineering (CISE) disciplines and to promote sharing research results in undergraduate education.

A key focus of the project proposal is the development of instruction modules. Each PI led the development task for one of three initial modules: a distributed systems module, a performability module and a



(L to R) Mostafa Bassiouni, Ratan Guha and Erol Gelenbe

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security module. Two additional modules, on networks and applications, are in development. These materials are the foundation of a new undergraduate course, Distributed Systems and Applications, which was first offered in the Spring 2002 semester.

"The modules provide students with the basic concepts and fundamental results in each field," says Guha. "The course has been successful and has given us confidence in the modular approach. And we hope to add two more courses in the next year as part of the project."

A special, week-long workshop, "Summer Workshop on Distributed Systems and Applications: Innovative Curriculum for Undergraduate Computer Science and Engineering Students," was developed also. "The workshop will provide concentrated seminars, an overview of the modules and their associated labs, as well as

explain the Web-based course development environment at UCF," adds Guha. "For this first year, the workshop is by invitation only, and faculty from minority institutions (HBCU/MI) were invited to attend. Our guests are from two Univ. of Puerto Rico campuses (Mayaguez and Arecibo), California State Univ.-San Bernadino, Univ. of Texas and Univ. of Houston. We also welcome Dr. Y. B. Reedy of Grambling State Univ., who is attending the workshop and will spend a few of months working with our CS department as part of the project's Visiting Faculty Program."

Bassiouni, Gelenbe and Guha intend to do the seminars again next year. UCF's Faculty Center for Teaching and Learning (FCTL), Course Development and Web Services unit and the Office of Instructional Resources are also participating in this year's workshop.

Integrative Graduate Education and Research Traineeship: Optical Communications and Networking

Guifang Li, Associate Professor of Optics, Physics and ECE, and Mostafa Bassiouni, Professor of Computer Science, have earned \$445,000 for the CS program from NSF for an Integrative Graduate Education and Research Traineeship (IGERT) program with a multidisciplinary research theme in optical communications and networking. Over the next five years, the program will train 30 Ph.D. students in a joint effort with 20 UCF scientists, engineers and educators from the departments/schools of Mathematics, Statistics, Optics, Physics, Material Science, Electrical Engineering, Computer Science and Education.

Research efforts will focus on four areas: advanced components, transport, switching and networking and network management. One goal for this graduate education and training program is to provide IGERT students with a research framework that crosses disciplines, is vertically integrated and is conducive to industrial involvement.

Both PIs hope to create a diversified team environment for learning and to offer an advising/mentoring structure that works with the research framework and the integrated education and training goals. IGERT students will benefit from new courses, developed by a companion NSF grant and the same PIs, covering the latest developments in optical networks.

States Bassiouni, "The project provides hands-on training on campus and in an industrial setting. It gives students a complete, non-technical training that incorporates interpersonal and business skills with ethics. Our team learning and team advising provide an innovative atmosphere that is enhanced by co-op in industry or government labs. Essentially, our goal is to produce 30 very well-trained Ph.D. students that will become leaders in their careers and will impact many other students who will benefit from the activities the IGERT program will bring."



Research Experience for Undergraduates in Computer Vision

Research Experience for Undergraduates in Computer Vision has operated successfully within UCF's Department of Computer Science since the inception of REU by NSF in 1987. In these 15 years, nearly 150 undergraduate students from institutions in and outside of Florida have participated in the program. And during the past three years, this grant has brought \$202,000 in funding.

Focused on the opportune area of computer vision, the project is led by PI Mubarak Shah, Professor of Computer Science, and Co-PIs Niels J. da Vitoria Lobo, Associate Professor of Computer Science, and Takis Kasparis, Associate Professor of Electrical Engineering.



"The aim for the REU grant," says Shah, "is to encourage talented undergraduates into research careers." The project includes 10 students per year for five years. Each year, the students take part in a 10-week, full-time summer program, followed by part-time participation in the subsequent fall and spring terms. The year-long program includes five primary phases: (1) recruiting, (2) a short course, (3) research project selection, (4) coursework in CAP 5415 Computer Vision and (5) writing a technical report on the project.

Shah states there are several distinctive elements to the project. First, students gain a full calendar year of experience. Second, all participants are assigned a faculty advisor from his or her own school. Also, the project truly immerses students in a serious research environment, and they must meet real expectations in addition to the research. Students also have advisor and/or group research meetings, attend colloquia presentations and meet with visiting researchers.

Shah adds that the REU experience prepares undergraduates for the future. "To date, our REU participants have co-authored more than 50 research papers. Approximately half of the students have gone to graduate schools and five have written Honors in the Major Theses. Four participants are now faculty members at different universities, and another four REU students have started their own companies. All are a testimony to the benefits students receive from a program such as REU in computer vision."

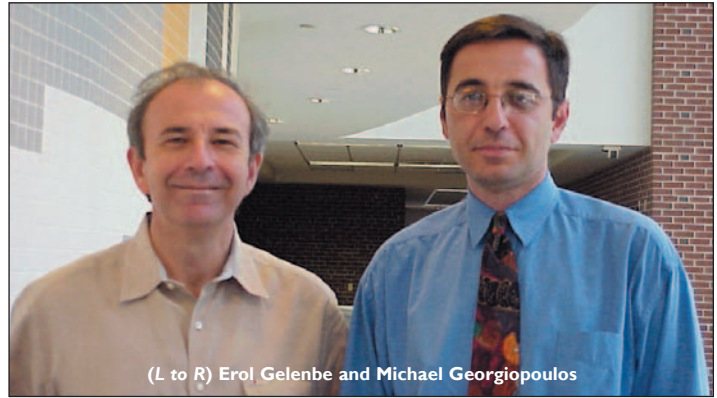
Combined Research Curriculum Development: Machine Learning Advances for Engineering Education

The Combined Research-Curriculum Development (CRCD) program is another grant from NSF earned by SEECS. A joint project of the Directorate for Engineering (ENG) and the Directorate for Computer and Information Science and Engineering (CISE), the CRCD program will bring \$407,000 to SEECS.

The mission accepted by the PIs, Michael Georgiopoulos, Professor of Electrical Engineering, and Erol Gelenbe, is to integrate innovative and modern multidisciplinary projects into upper level undergraduate and introductory graduate curricula in engineering, computer and information science. Projects within the CRCD program address the need for ground-breaking courses, textbooks, instructional modules and instruction laboratories by bringing the research and educational interests of faculty into the classroom.

Explains Gelenbe, “The CRCD program works to connect faculty researchers with students in an innovative environment and curriculum where education and research are of equal value. We also want research and education to have the support of the academic administration and industry and to be complementary parts of an integrative engineering and science education enterprise.”

Typically, NSF has always had a mission to invest in people, Gelenbe says. The foundation wants people to work on the development of a diverse, internationally competitive and globally-engaged work force of engineers, scientists and well-prepared citizens. He



(L to R) Erol Gelenbe and Michael Georgiopoulos

adds that NSF uses ideas to provide a deep and broad foundation in science and engineering. And the foundation encourages the use of tools to give students access to a science and engineering infrastructure that is widely accessible and state of the art.

Gelenbe continues, “Our work with the CRCD project at UCF focuses on bringing many disciplines together with the latest technology to develop new courses and enhance our curriculum and the student experience. Our emphasis on critical thinking, intellectual growth and communication skills adds to the knowledge our students graduate with.”

Autonomous Vehicle Design for Competition by Undergraduate Students

A visionary concept to combine advanced robotic simulation with both classroom and research experience has earned funding and contributed to a new course within SEECS. Students in UCF’s Robotic Combat Club (Rc²) had strong interest in building a robot for competition. Members of Rc² asked Fernando Gonzalez, Assistant Professor of Computer Engineering, to work with them on a robot and to help them earn funding for a project.

Gonzalez wrote a proposal for the Autonomous Vehicle Design for Competition program, which was accepted by the Naval Air Warfare Center, Training Systems Division (NAWCTSD) in support of the Simulation, Training and Instrumentation Command (STRICOM). The proposal focused on two points: creating a new undergraduate robotics course and building an autonomous vehicle to exhibit innovative intelligent vehicle behaviors on a robotics platform at the STRICOM CFTDC.

Next, Gonzalez developed a new robotics curriculum. He and the club’s members began to generate interest in the autonomous vehicle design course, which was held for the first time in the Spring 2002 semester. Roughly 35 students from various disciplines — Computer Science, Electrical, Computer and Mechanical Engineering in particular — registered for the class.

The course, EEL 4932, was divided into 12 phases with the end goal to have a vehicle

ready for competition at the 10th Annual Intelligent Ground Vehicle Competition, held in Orlando in July 2002. Students were split into groups, and each unit focused on a primary aspect of the robot’s design, technological components and/or construction.

As part of the curriculum, the groups worked within areas of specialty (i.e. CS students focused on high-level software while EE students concentrated on electrical circuits). And all groups had to communicate their progress and plans with the others.

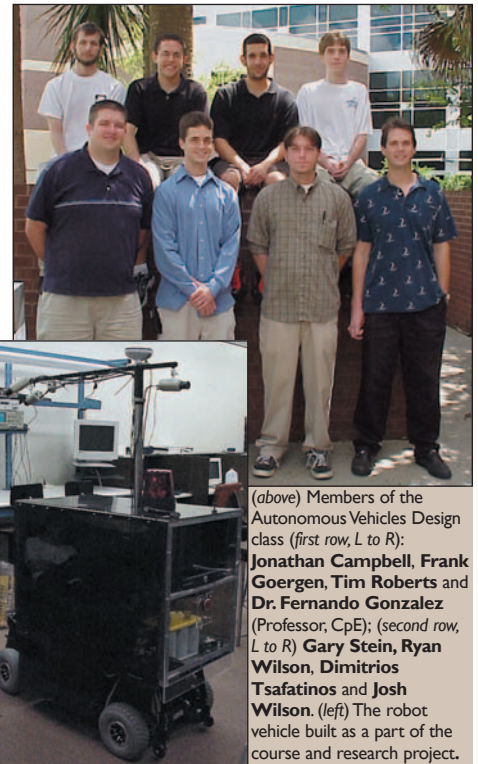
“This is a very interdisciplinary project that provides real-life experience. This class and vehicle project gives students exposure to a lot of design elements plus the experience of building circuits and working with different types of hardware,” explains Gonzalez. “Mechanical aspects of design were also addressed, and the course provided learning opportunities that are different from other classes offered.”

The curriculum introduced undergraduate students to subjects including:

- robotic controls, including robotic kinematics, motion planning and dynamics,
- data acquisition from GPS and other sensors,
- video sensing, image capture, robotic vision, and basic object recognition,
- electric motors, variable speed motor controllers, and
- artificial intelligence.

Gonzalez adds, “Four disciplines had to work together like in a real company, and

the students had to handle other responsibilities found on the job, such as budgeting the funding, purchasing equipment, following purchasing procedures and time management. These are very realistic situations and students welcomed the experience, learned a tremendous amount and produced an excellent vehicle for competition.”



(above) Members of the Autonomous Vehicles Design class (first row, L to R): Jonathan Campbell, Frank Goergen, Tim Roberts and Dr. Fernando Gonzalez (Professor, CpE); (second row, L to R) Gary Stein, Ryan Wilson, Dimitrios Tsafatinos and Josh Wilson. (left) The robot vehicle built as a part of the course and research project.

Seminar Series Continues to Grow

Lecturer and colloquium speakers attract wide interest

Distinguished Lecturers

Y. C. Ho, Harvard University

The No Free Lunch Theorem, Complexity and Network Security

Friday, April 5, 2002

Colloquium Speakers

Tarek Taha, Georgia Institute of Technology

Analytical Techniques to Evaluate Computer Architectures

Monday, April 1, 2002

Rakesh (Teddy) Kumar, Sarnoff Corporation, Princeton, NJ

Creating Magic by Aligning Pixels

Tuesday, April 2, 2002

Mainak Chatterjee, University of Texas, Arlington

Efficient Retransmission Schemes for 3G Wireless Data Networks

Thursday, April 4, 2002

Alexander Mohr, Dept. of CSE, University of Washington

Robust and Scalable Delivery of Time-Sensitive Multimedia

Monday, April 8, 2002

Yves Robert, Ecole Normale Supérieure de Lyon, France

Scheduling and Load Balancing on Heterogeneous Clusters

Thursday, April 11, 2002

Mark Heinrich, Dept. of ECE, Cornell University

Active Memory Clusters: Efficient Multiprocessing on Commodity Clusters

Monday, April 15, 2002

Sven Dickinson, Dept. of CS, University of Toronto

Bridging the Representational Gap in Computer Vision

Monday, April 15, 2002

Suzanne Stevenson, Dept. of CS, University of Toronto

Exploiting Multilingual Corpora in Acquiring Lexical Knowledge

Tuesday, April 16, 2002

Joergen Bang-Jensen, University of Southern Denmark, Odense Campus

Sequential and Parallel Algorithms for Hamiltonian Path and Cycle Problems in Tournament-Like Digraphs

Friday, April 19, 2002

Daniel J. Burroughs, Dartmouth College

Correlating Network Attacks Using Bayesian Multiple Hypothesis Tracking

Wednesday, May 1, 2002

Brian Lail, New Mexico State University, Las Cruces

Coupling Through Narrow-Slot Apertures to Thin-Wire Structures

Friday, May 3, 2002

Alma Riska, College of William and Mary

Load Balancing Policies in Clustered Web Servers

Wednesday, May 8, 2002

Visvanathan Ramesh, Siemens Corporate Research

Real-Time Video Analysis at Siemens Corporate Research

Thursday, May 9, 2002

Eva Hudlicka, Psychometrix Associates, Blacksburg, VA

This Time With Feeling: Methodology and Test Bed for Modeling State and Trait Effects in Decision Making

Friday, May 10, 2002

T. Engin Tuncer, Electrical and Electronics Engineering Dept. METU, Ankara, Turkey

Systems of Data Communications and Cable Modems

Thursday, May 16, 2002

Xiang Sean Zhou, Beckman Institute for Advanced Science and Technology, University of Illinois, Urbana-Champaign

Research Topics in Content-Based Access of Image and Video Data

Monday, May 20, 2002

Osman Burchan Bayazit, Dept. of CS, Texas A&M University

Randomized Motion Planning: From Intelligent CAD to Drug Design to Group Behaviors

Monday, May 20, 2002

Xin Yuan, Florida State University

Quality of Service Routing: Challenges and Solutions

Tuesday, May 21, 2002

Tamer Inanc, Pennsylvania State University

A Novel Approach to Active Vision Systems: Identification, Control and Real Time Tracking

Thursday, May 23, 2002

Murray Woodside, Dept. of Systems and Computer Engineering, Carleton University, Canada

An Overview of Layered Performance Modeling

Thursday, May 23, 2002

Joochan Lee, Dept. of CS, Center for Systems Assurance, Syracuse University

Computational Resiliency: Heterogeneous Reliable Applications

Tuesday, May 28, 2002

SEECs Funded Research Climbs to \$5.5 Million

SEECs faculty were busy submitting proposals for research grants and securing funding during the 2002 fiscal year, which ended June 30, 2002. The school's departments, Electrical Engineering (EE), Computer Engineering (CpE) and Computer Science (CS), received funding from a variety of federal and state government agencies as well as the private sector.

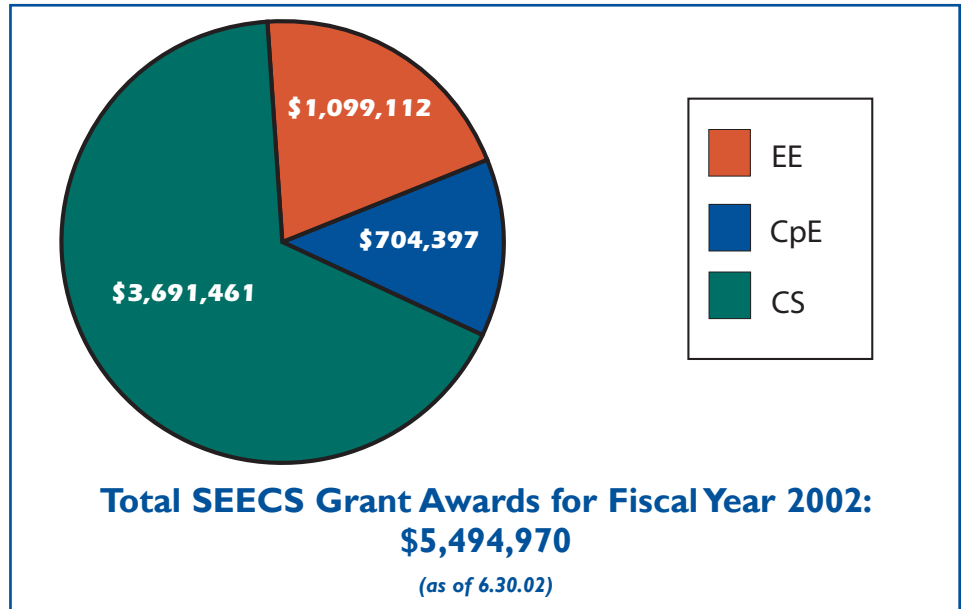
For example, the EE department secured research awards from federal partners such as the National Science Foundation, NASA, STRICOM and Jet Propulsion Laboratory among others. Industry partners included Intel Corp., Raytheon E-Systems, Inc., Intersil Corp., TERANEX and Lockheed Martin.

CS faculty received federal research grants from the National Institute of Health, NSF, Army Research Office and Office of Naval Research. Funding was also acquired from industry associates including ITT Industries Inc. (Systems Division), Guardian Solutions Inc., Lockheed Martin, Florida Hospital, ImageSoft Technologies and Millennium Technology Inc.

The CpE and CS departments earned funding for several federal projects from

the Simulation, Training and Instrumentation Command (STRICOM). And both departments secured grants from the Naval Air Warfare Center Training Systems Division (NAWCTSD). Also, CpE received a state-funded research project from Florida A&M University.

"SEECs faculty and staff have worked very hard to submit proposals for research projects during the past year. The amount of successful proposals by our faculty members is rising each semester," states Erol Gelenbe, Director of SEECs. "We are continuing to push the level and quality of our research higher, and the results are showing."



Spring 2002 Faculty Seminars and Presentations

- I. BATARSEH:** "Advanced Research Topics in Power Electronics," and "Multimedia Delivery of Power Electronics Education," University of Salerno, Italy, Jan. 31 - Feb. 1, 2002.
- N. DEO:** "Computing the 3-D Molecular Structure in Parallel," Colloquium at the Combinatorial Algorithms Group, University of Victoria, Canada, Mar. 15, 2002.
- E. GELENBE:** "Design and Performance of Cognitive Packet Networks," The Dean's Seminar Series, College of Engineering, University of Florida, Gainesville, FL, Jan. 16, 2002.
- E. GELENBE:** "Design and Measurement of Cognitive Packet Networks," Seminar at Bogazi University, Computer Engineering Department, Istanbul, Turkey, Mar. 13, 2002.
- E. GELENBE:** "Cognitive Packet Networks," Seminar at the Department of Computer Science, University of Houston, TX, Apr. 25, 2002.
- E. GELENBE:** "Adaptive Network Architecture Using Random Neural Network Routing," Seminar at the Department of Computing, Imperial College, University of London, England, May 15, 2002.
- E. GELENBE:** "Cognitive Packet Networks," Seminar at the Institut Montefiore, University of Liege, Belgium, June 17, 2002.
- E. GELENBE:** "G-reseaux — Nouvelles Formes-Produit de Reseaux Stochastiques: Existence, Unicité et Application à l'Analyse de

- Grands Systemes," Seminar at INRIA, Rocquencourt, France, June 18, 2002.
- K. A. HUA:** "Cost-Effective Video Streaming Techniques," "Broadcast Techniques for Video on Demand," and "Efficient and Cost-Effective Techniques for Browsing and Indexing Image/Video Databases," Distinguished Lecturer Series, TamKang University, Taiwan, June 5-6, 2002.
- C. L. LISETTI:** "Affective Social Computing and the Future," Association for Computing Machinery, Student Chapter, Orlando, FL, Feb. 6, 2002.
- M. SHAH:** "Understanding Human Behavior from Video Sequences," Computer Science Department, University of Dallas, TX, Jan. 3, 2002.
- M. SHAH:** "Overview of UCF REU in Computer Vision," NSF REU PIs Meeting, Orlando, FL, Jan. 14, 2002.
- M. SHAH:** "Video Understanding Research at UCF," TASC, Boston, MA, Feb. 15, 2002.
- L. WEI:** "A Turbo Decoding Method for Conventional Serial Concatenated Codes," IEEE Gainesville section, University of Florida, Gainesville, FL, Mar. 12, 2002.
- A. S. WU:** "The Proportional Genetic Algorithm," Keynote Talk at the Dagstuhl Seminar on Theory of Evolutionary Algorithms, Schloss Dagstuhl, Wadern, Germany, Jan. 15, 2002.

SEECs Achievements Recognized

The Spring 2002 semester recently came to a close, and the end of the term brought awards and recognition for many SEECs faculty members and students. The following are a few of the honors earned within our school:

Faculty:

ISSA BATARSEH, Assistant Dean of Graduate Studies, Computer and Electrical Engineering, was promoted recently to full Professor of Electrical Engineering.

EROL GELENBE, Director of SEECs, was elected a professional member of Eta Kappa Nu, the national Electrical Engineering Honor Society.

MICHAEL GEORGIPOULOS has been promoted to full Professor of Electrical Engineering.

JANNICK ROLLAND, Assistant Professor of Computer Science, and her team demonstrated at the ARCH Virtual Reality display at the Orlando Science Center on Feb. 23, 2002, as part of an initiative to honor Women in the Sciences. The event was a great success with more than 3,000 participants.

MUBARAK SHAH, Professor of Computer Science, received a \$60,000 corporate grant from Lockheed-Martin for his research project, "Advanced Image-Based Tracking," which is the third largest grant from Lockheed-Martin Corporation out of 22 national awards.

Students:

GREGORY C. AUERBACH, a Computer Engineering major, is one of eight UCF undergraduate students to receive the Order of Pegasus, a university honor recognizing outstanding graduating seniors and graduate

students. Recipients of the award have demonstrated exemplary involvement, leadership, academic achievement and community service.

CHRISTOPHER FUHRMAN is an undergraduate Honor Student working with Dr. Jannick Rolland on distributed systems and has been recently selected for the 2002-2003 President's Leadership Council.

FRANK GOERGEN, a Computer Engineering major, won the "Outstanding Undergraduate Student" award from the Orlando Section of IEEE (Institute of Electrical and Electronics Engineering), the world's largest technical professional organization with more than 315,000 electrical and computer engineers in roughly 150 countries.

RUSTY PHILIPS, who is receiving his B.S. (Honors in the Major) in Computer Science and is an advisee of Dr. Mubarak Shah, recently received third prize from the College of Engineering and Computer Science on his Honors in the Major Thesis.

TIFFANI WILLIAMS, who earned a Ph.D. in Computer Science from UCF in Fall 2000 and served as a Visiting Lecturer in CS for a year, received one of the prestigious Alfred P. Sloan Foundation Postdoctoral Fellowships.

In March, the **UCF PROGRAMMING TEAM** finished fifth in the United States and 27th in the world in the International Collegiate Programming Contest Finals, sponsored by the Association for Computing Machinery (ACM). UCF's team was one of 64 to advance to the contest finals from an initial field of more than 3,000 teams from 67 countries.

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).

Exceptional Faculty Honored

David Workman, Associate Professor of Computer Science and CS Undergraduate Coordinator, won the College of Engineering and Computer Science Award for Faculty Excellence in Undergraduate Advising for 2002. Recently, he was the Local Arrangements Chairman for the International Conference on Software Engineering (ICSE 2002), held in Orlando, May 19-25.

ISCIS XVIII

17th International Symposium on Computer and Information Sciences



October 28-30, 2002
University of Central Florida
Orlando, FL

ISCIS is proud to announce the 17th International Symposium on Computer and Information Sciences. ISCIS is a series of conferences that brings together computer scientists from around the world. The symposium also will include a special session on Advanced Networking Hardware, which will provide a forum for scientists and engineers from academia and industry to discuss their latest research.

Additional topics of interest include:

- Architectures and systems
- Performance modeling
- Multimedia
- Web and grid computing
- Graphics and computer vision
- Networks
- Soft computing
- Computer science theory
- Databases
- Computer security
- Intelligent systems

For more information, please visit the ISCIS Web site at www.cs.ucf.edu/~iscis02 or send e-mail to iscis02@cs.ucf.edu or to Dr. Ilyas Cicekli, ISCIS Chair, at ilyas@cs.ucf.edu.

Hot Off the Press: 2002 Faculty Publications

- J. Abu-Qahouq, **I. BATARSEH**, **T. KASPARIS**, N. Pongratananukul, "Multiphase Voltage-Mode Hysteretic Controlled VRM with DSP Control and Current Sharing Solution," IEEE-Applied Power Electronics Conference and Exposition Proceedings, vol. 2, pp. 663-669, Mar. 2002.
- A. Akcay, R. Banks, L. Davis, B. DelVento, Y. Ha, C. Meyer, **J. P. ROLLAND**, V. Shaoulov, H. Zheng, "3-D Visualization and Imaging in Distributed Collaborative Environments," IEEE Computer Graphics and Applications, vol. 22, no. 1, pp. 11-13, Jan.-Feb. 2002.
- M. BASSIOUNI**, **R. GUHA**, "Modeling and Analysis of Temporal Failure and Degradation Behavior of Critical Infrastructure Systems," Proceedings of the 35th Hawaii International Conference on System Sciences, Jan. 2002.
- M. BASSIOUNI**, **W. CUI**, "Analysis of Hierarchical Cellular Networks with Mobile Base Stations," Journal of Wireless Communications and Mobile Computing, vol. 2, pp. 131-149, Mar. 2002.
- I. BATARSEH**, X. Gao, J. Luo, **T. WU**, "Novel Transient Cancellation Control Method for Future Generation of Microprocessors," IEEEAPPEC'02, Dallas, TX, vol. 1, pp. 223-229, Mar. 2002.
- I. BATARSEH**, W. Gu, **S. LUO**, W. Qiu, W. Wu, "A Bi-Flyback PFC Converter with Low Intermediate Bus Voltage and Tight Output Voltage Regulation for Universal Input Applications," Applied Power Electronics Conference and Exposition Proceedings, vol. 1, pp. 249-255, Mar. 2002.
- I. BATARSEH**, C. Iannello, **S. LUO**, W. Qiu, "Optimization Design of a Single-Stage AC-DC Converter with Averaging Circuit Model and MathCAD," Applied Power Electronics Conference and Exposition Proceedings, vol. 1, pp. 459-466, Mar. 2002.
- I. BATARSEH**, W. Gu, W. Qiu, W. Wu, "A Modified Control Scheme to Alleviate DC Voltage Stress in Active Clamp PFC AC-DC Converter with Universal Input," Applied Power Electronics Conference and Exposition Proceedings, vol. 1, pp. 483-489, Mar. 2002.
- I. BATARSEH**, W. Gu, W. Qiu, W. Wu, "A Multiphase DC-DC Converter with Hysteretic Voltage Control and Current Sharing," IEEEAPPEC'02, Dallas, TX, vol. 2, pp. 670-674, Mar. 2002.
- N. Bianchi, **C. L. LISETTI**, "Modeling Multimodal Expression of User's Affective Subjective Experience," User Modeling and User-Adapted Interaction, vol. 12, no. 1, pp. 49-84, 2002.
- H. Cai, D. Gan, **Z. QU**, "Determination of Power Transfer Capacity of UPFC with Consideration of System and Equipment Constraints and Installation Locations," IEEE Proceedings: Part C: Generation, Transmission and Distribution, vol. 149, no. 1, Jan. 2002.
- K. CASEY**, **C. KLEMENZ**, **D. C. MALOCHA**, M. Pereira da Cunha, **D. PUCCIO**, "Investigation of Langanite and Langatate Materials for Use in SAW Device Applications," International Conference on New Piezoelectric Materials and High Performance Acoustic Wave Devices, Japan Society for the Promotion of Science, Tokyo, Japan, pp. 117-124, Jan. 2002.
- L. Davis, S. Frolich, Y. Ha, K. Lin, G. Martin, C. Meyer, J. Norfleet, B. Pettitt, **J. P. ROLLAND**, "Desktop Augmented Reality: Visualization of anatomical airways," Proceedings of MMVR 2002, pp. 121-126, Jan. 2002.
- N. DEO**, **P. GUPTA**, "Empirical Analysis of Graph-Theoretic Models For the World Wide Web," 33rd Southeastern International Conference on Combinatorics, Graph Theory and Computing, Boca Raton, FL, Mar. 4-8, 2002.
- N. DEO**, **P. MICEKVICIUS**, "A New Encoding for Labeled Trees: Employing a stack and a queue," Bulletin of the Institute of Combinatorics and Its Applications, vol. 34, pp. 77-85, Jan. 2002.
- N. DEO**, **P. MICEKVICIUS**, "Cyclic One-Factorization of a Complete 3-Uniform Hypergraph," 33rd Southeastern International Conference on Combinatorics, Graph Theory and Computing, Boca Raton, FL, Mar. 4-8, 2002.
- N. DEO**, **Z. NIKOLOSKI**, F. Suraweera, "Generation of Graceful Trees," 33rd Southeastern International Conference on Combinatorics, Graph Theory and Computing, Boca Raton, FL, Mar. 4-8, 2002.
- N. DEO**, **Y. ZHANG**, "Estimating the Independence Number of a Large Random Graph," 33rd Southeastern International Conference on Combinatorics, Graph Theory and Computing, Boca Raton, FL, Mar. 4-8, 2002.
- H. FRANCOIS-SAINT-CYR**, R. Helmbold, **D. C. MALOCHA**, **K. RICHARDSON**, "Measurements of LGS, LGN and LGT Thermal Expansion Coefficients of Expansion and Density," IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control, vol. 49, no. 3, pp. 350-355, Mar. 2002.
- K. J. GAMBLE**, **D. C. MALOCHA**, "Simulation of Short LSAW Transducers Including Electrode Mass Loading and Finite Finger Resistance," IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control, vol. 49, no. 1, pp. 47-56, Jan. 2002.
- E. GELENBE**, "Cognitive Packet Networks," Keynote Address, Conference on Communication Networks Modeling and Simulation, Winter Simulation Conference, Society for Computer Simulation, San Antonio, TX, Jan. 27-30, 2002.
- A. Hevner, R. Linger, A. Sobel, **G. WALTON**, "The Flow-Service Quality Framework: Unified engineering for large-scale, adaptive systems," Proceedings of the Hawaii International Conference on System Sciences, Jan. 2002.
- K. A. HUA**, K. Prabhakara, **D. TRAN**, "On the Efficient Use of Multiple Physical-Channel Air Cache," Proc. of IEEE Wireless Communications and Networking Conference, Mar. 17-21, 2002.
- R. A. Kennedy, **Q. WANG**, **L. WEI**, "Iterative Viterbi Decoding, Trellis Shaping and Multilevel Structure for High-Rate Concatenated TCM," IEEE Transactions on Communications, Jan. 2002.
- A. Myles, **M. SHAH**, **N. DA VITORIA LOBO**, "Wheelchair Detection in a Calibrated Environment," Asian Conference on Computer Vision, Melbourne, Australia, pp. 706-712, Jan. 2002.
- W. Phillips III, **M. SHAH**, **N. DA VITORIA LOBO**, "Flame Recognition in Video," Pattern Recognition Letters, vol. 23, no. 1-3, pp. 319-327, Jan. 2002.
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Eta Kappa Nu Honor Society Recognizes Top Students and Builds BattleBot

UCF's chapter of Eta Kappa Nu was established in 1975 at what was then Florida Technological University. An international honor society, Eta Kappa Nu recognizes the high academic achievements of students majoring in electrical and computer engineering.

Candidates are selected based on marked ability, as evidenced by scholarship, personal character, useful voluntary services and distinguished accomplishments. The organization offers a variety of student and career services plus lifetime assistance in becoming better professionals and citizens.

In 2001, UCF's chapter decided to build a competition robot or "BattleBot." Started in 1999, BattleBot competitions pit two remote-controlled vehicles against each other in a double-elimination contest. The sport, known as "robotic combat," encourages the destruction of an opponent, and the BattleBots are designed with a variety of destructive weapons, including whirling saw blades, hammers, battering rams, spikes and even pneumatic cannons. It has become so popular that BattleBot



Some of Eta Kappa Nu Honor Society's members and officers pose with *Moebius I*, one of two BattleBot robots the chapter has successfully built. From left to right: James Coots (Secretary), Jay A. Shah (President, incoming), Dr. Chris Bauer, faculty advisor, Stacy Jimerson (Treasurer), Frank Goergen (Vice-President), Jonathan Campbell (President, outgoing) and John Durning (Vice-President, outgoing).

competitions are televised nationally on Comedy Central as well as in Canada, the United Kingdom and New Zealand.

Eta Kappa Nu, with help from UCF's Robotic Combat Club, built two BattleBots, *Moebius I* and *Moebius II*. Both bots have competed regionally and *Moebius II* has battled at the national level. Weapons on both include a bullet-proof, spinning shell and six

titanium blades — 4 inches long and 1 inch thick — staggered around the shell. In testing, *Moebius I* easily destroyed an old IBM server, shredded a computer monitor, ate a 16-pound bowling ball and ripped apart a microwave, throwing the door 25 feet in the air. Both bots have done well in competition, and the chapter has attracted lots of attention, thanks to publicity from campus news, Internet radio, Orlando newspapers and morning television programs.

Frank Goergen, Eta Kappa Nu Vice-President, says the BattleBots have opened new doors: "As a result of the BattleBot project's success, our chapter and the robotics club have been presented with several opportunities for expansion. It's been great!"

"We are proud of the accomplishments of Eta Kappa Nu's members, both while they are in school and as alumni of the School of Electrical Engineering and Computer Science," says Chris Bauer, the chapter's faculty advisor. "The recent work our members have done in the BattleBot competitions has brought additional, excellent recognition to the SEecs programs at UCF."