CONNECTIONS

ELECTRICAL AND COMPUTER ENGINEERING

A newsletter of the
Department of Electrical
and Computer Engineering

Abshire and La receive NSF CAREER Awards

Assistant professors **Pamela Abshire** and **Richard La** have both received National Science Foundation (NSF) Faculty Early Career Development (CAREER) Awards, given to foster the career development of outstanding junior faculty, combining research and education of the highest quality and broadest sense.

Pamela Abshire was chosen for her research on "Physical Information Efficiency for Sensing, Communicating and Computing."

"The goal of my research is better understanding of the efficiency of physical communication and computation," Abshire says. "The central problem is that, for the most part, we don't even know what constitutes efficiency in physical systems. Without a yardstick, it's hard to determine how well our current engineered technologies are performing and how they compare to other existing technologies found in biological systems."

Abshire will address this problem in both natural and engineered systems by developing information processing models, analyzing performance bottlenecks and performance tradeoffs versus resources in those systems, and experimentally demonstrating principles of efficient information processing in engineered systems.

Richard La received his award for "Network Modeling and Resource Allocation."

La's research will build an integrated research and education program focusing on network modeling, performance evaluation and algorithm designs. "The proposed work is a part of efforts to enable quality of service (QoS) provisioning with statistical guarantees in data networks," La says. "Before statistical QoS guarantees can be provided, there are several issues that need to be addressed."

For example, accurate traffic models that will allow performance estimation of various applications must be developed, networks must be properly provisioned, a sound pricing mechanism that will promote the continuing growth of the Internet must be in place, and problems in wireless networks where resources are more scarce must be resolved through intelligent scheduling and resource allocation mechanisms.

Message from the Chair

In this issue of *Connections*, I begin with a very important announcement. Professor **Eyad Abed** has been named the new director of the Institute for Systems Research. Dr. Abed, who joined us in 1983, brings both leadership and expertise to his new position. For more information on Dr. Abed, please see our profile on the back cover.

Two of our alums, **Y. C. Buno Pati** and **Brian Hinman,** were recently honored at the University of Maryland's Fourth Annual Alumni Association Awards Gala. Pati, who received his bachelor's, master's and Ph.D. in electrical engineering, received the Clark School's 2003 Distinguished Alumnus Award. He was honored for his contributions to the field of engineering and the advancement of technology. Hinman, who received his bachelor's degree in electrical engineering in 1982, was the recipient of the Ralph J. Tyser Medallion for providing unique and significant service to the university. We take great pride in their accomplishments, as we do in the accomplishments of our many alumni that have established the strong reputation of the department.

On page six we profile Professor **Rama Chellappa,** who was recently named a Distinguished Teacher-Scholar for the university. Chellappa, who also is an accomplished researcher, brings to his classes an enthusiasm and a creativity that is quite infectious. As one student put it, "…there was never a dull moment."

Also, two of our faculty members, Assistant Professor **Pamela Abshire** and Assistant Professor **Richard La,** are the recent recipients of National Science Foundation Faculty Early Career Development (CAREER) Awards. Dr. Abshire says she is "absolutely ecstatic" to have received this award. On behalf of both of them, we as their colleagues agree. Congratulations, Pamela and Richard.

Speaking of faculty, we welcome two new faculty members in this issue. **Thomas E. Murphy** and **Ankur Srivastava** have joined the faculty as assistant professors. Both bring with them excellent credentials. We are delighted to have them join us and look forward to their contributions to our department.

On page four we profile the newest addition to our series of Capstone courses, which provide undergraduate students with hands-on design experience. ENEE 408G focuses on multimedia signal processing using state-of-the-art multimedia software and hardware. The course was created by Professor **K.J. Ray Liu,** along with Assistant Professor **Min Wu,** and **Guan-Ming Su,** a Ph.D. student. It has been eagerly embraced by our students, who welcome this opportunity to develop skills in this growing field.

As you know, universities across the country are enduring shrinking endowments and state budgets. The Department of Electrical and Computer Engineering has made great strides in the last decade. We are considered one of the finest departments in the country, and one of the most active education and research units at the University of Maryland. We are doing everything we can to maintain our outstanding quality as we weather these economic conditions. But frankly, now more than ever, we need the financial help of our alumni. We hope that you will consider making a gift to the department's education programs. An envelope is enclosed in this newsletter. Thank you in advance for your support. ⊏

New grants to ECE faculty

NSF grant: Acoustic-Phonetic Knowledge and Speech Recognition

Associate Professor **Carol Espy-Wilson** received a three-year, $407,549 National Science Foundation (NSF) grant for "Acoustic-Phonetic Knowledge and Speech Recognition." The project will develop a robust automatic speech recognition system, including acoustic parameters that target the linguistic information in the speech signal and a new paradigm for recognition that integrates current speech knowledge with a powerful statistical framework.

NSF grant: Distributed Signal Design and Optimum Transmit Strategies for Wireless Networks

Assistant Professor **Sennur Ulukus** has been awarded a three-year, $235,647 NSF grant for her project, "Distributed Signal Design and Optimum Transmit Strategies for Wireless Networks." The goal of this project is to understand and determine the ultimate capacity limits of wireless communication networks, and develop techniques and algorithms to achieve or approach them. Developing principles and guidelines for the design of future wireless networks will be an important consequence of this research.

DARPA grant for the THOR program

Professor **Christopher Davis,** Professor **Uzi Vishkin** and Institute for Systems Research senior research scientist, **Stuart Milner,** all of the Maryland Optics Group, have received a Defense Advanced Research Projects Agency (DARPA) grant under its TeraHertz Operational Reachback (THOR) program. The THOR program is developing optical wireless links that will form an "Internet in the Sky" and allow very high data rate transfer to anywhere in

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the world in a secure way and without the need for installed fiber optic infrastructure.

NSF grant: Piezoelectric Phononic Lattice Surface Acoustic Wave Devices on Silicon and Sapphire for Ultra-High Frequency Filters and Biomedical Sensor Applications

Associate Professor **Agis Iliadis** has been awarded a three-year, $270,000 NSF grant for "Piezoelectric Phononic Lattice Surface Acoustic Wave Devices on Silicon and Sapphire for Ultra-High Frequency Filters and Biomedical Sensor Applications." He will be developing a novel surface acoustic wave sensor/filter device based on the "pass" and "stop" frequency bands of phononic lattices. The ultra-high frequency band pass filters could revolutionize wireless and mobile communication systems.

DURIP award for a high-speech modeling and simulation test bed for networked systems

Professor **John Baras** is the principal investigator for a Defense University Research Instrumentation Program (DURIP) award from the Army Research Office. The $264,000 award, one of only 125 granted nationwide, is for a high-speech modeling and simulation test bed for networked systems that will be used by the Systems Engineering and Integration Laboratory.

NSF grant: Micro-Ball Bearing Technology for Micro-Electro-Mechanical Systems (MEMS)

Assistant Professor **Reza Ghodssi** is the principal investigator for a three-year, $270,000 NSF grant for "Micro-Ball Bearing Technology for Micro-Electro-Mechanical Systems (MEMS)." According to Ghodssi, MEMS are not yet reliable and efficient enough for electrical and mechanical power demands in micro-systems. Ball bearing mechanisms are expected to increase long-term reliability and efficiency in micro-machines through minimizing friction and wear and provide robustness and stability for moving parts while avoiding fabrication complexities. Micro-ball bearing technology is expected to have a pivotal impact on micro-machinery applications.

NSF ITR grant: Vertical Protocol Integration in Ad-Hoc Wireless Networks

Professor **Anthony Ephremides,** Professor **John Baras,** Assistant Professor **Richard La** and Assistant Professor **Sennur Ulukus** have received a three-year $1.5 million NSF Information Technology Research grant to develop "Vertical Protocol Integration in Ad-Hoc Wireless Networks." The project seeks to exploit inter-layer dependencies in network protocols for improved network performance. Ephremides is the principal investigator for the project.

Fulbright Senior Specialists Program grant: Acoustic-Phonetic Knowledge and Speech Recognition

Professor **Victor Granatstein** has received a Fulbright Senior Specialists Program grant in information technology at Tel Aviv University in Israel. The program offers two-to six-week grants to leading U.S. academics and professionals to support curricular and faculty development and institutional planning at academic institutions in 140 countries.

200 posters available online from Research Review Day 2003

Many of the 200 posters from this year's Research Review Day are now available online for you to view or print out in PDF format.

Take a look at the latest research developments in optoelectronics and fiber optics; micro-electronics; multi-media and interactive systems; speech, image and video

signal processing; computer vision; neural science, telecommunications and networking; computer and communications security; software engineering and real time systems; computational algorithms; VLSI systems; control systems and systems engineering.

View the posters at *www.rrd.umd.edu.*
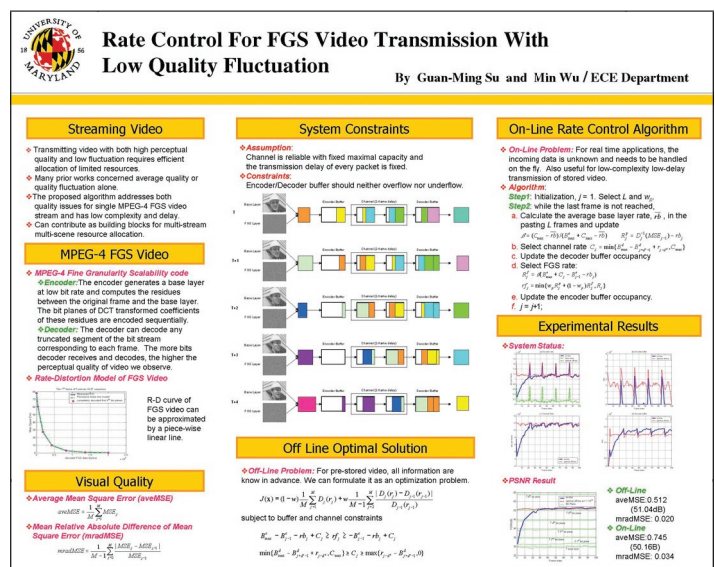
Course offers undergraduates hands-on experience with multimedia signal processing

Ariel Greenberg, a senior majoring in both biology and electrical engineering, had been considering his future options in bio-informatics, neuroscience and biophysics. Then this semester, he took ENEE 408G, Capstone Design Project: Multimedia Signal Processing.

"This course was my first full-fledged exposure to multimedia signal process-ing," says Greenberg. "Now, I hope to investigate multimedia signal processing in work or in graduate school at least on some level. This has become one of my favorite interdisciplinary topics."

Developed by Professor K. J. Ray Liu along with Assistant Professor Min Wu and Ph.D. student Guan-Ming Su, ENEE 408G is the newest addition to the series of Capstone courses, which offer students hands-on, real-world design experience. The class provides an introduction to mul-timedia signal processing using state-of-the-art multimedia software and hardware facilities.

As part of the course, students are required to participate in four small proj-ects on multimedia fundamentals, such as digital image and photography, digital video and multimedia communications, speech processing and recognition and dig-ital audio and security. Students also must participate in a final team project on the design and implementation of multimedia signal processing systems.

"The project requires students to emulate a high-tech multimedia product company," says Liu. "They have to choose system specifications; partition and coor-dinate the design tasks within the team; implement, test and dismount the design; and demonstrate and market the product.

We're offering undergradu-ate students an opportunity to have the background and skills they need to get good jobs."

Liu has been both surprised and impressed by the quality of the student design projects. Industry has taken notice, as well. Since the course began, Microsoft has donated more than $50,000 worth of software and hardware support.

"Students are already familiar with gadgets that result from signal processing in their daily lives—the PDA, digital camera and MP3 audio," says Wu, who teaches the course. "In my first lecture, I tell them that when they use these devices, they are consum-ers. But, as electrical engineers, they should have a curiosity about the technologic driving force—what's going on inside them."

Wu adds, "We're taking them from consumers to insiders and ultimately to become inventors of new technologies."

Students are eager to take the journey. "I've strengthened my skills on programs. I've learned how to develop programs that are similar to the ones being developed in industry," says Norman Lo, who is not only a former student in the course, but this spring was its teaching assistant as well. "You're getting a lot of hands-on experi-ence with this technology. This course will be invaluable to my future."

"You see, hear, and read and write about the engineering topics you learn,"

Professor K. J. Ray Liu (l), Assistant Professor Min Wu (c) and Ph.D. student Guan-Ming Su (r) with some of the devices used in ENEE 408G.

says Annette Keller, another senior taking the course. "Instead of being abstractions, the formulae take on life and change your methods. The formulae you implement result in real sound and picture effects that you can immediately and vividly see or hear."

For the final team-based project, Keller and her classmates worked on a project begun by a previous class. "It's a sort of Internet walkie-talkie with an iPaq Pocket PC," says Keller. Her team's plans for the device include "adding speech compression and synthesis to the walkie-talkie and making it fully speech function-al. We also would like to extend it to being a fully multimedia capable communicator with image processing and other media file handling," she says. "It's a lot of work."

But it's well worth it. Keller recently accepted a job with Argon Engineering and will be working on advanced signal intercept systems. She feels the course will be beneficial to her professional life. "I've already learned many practical profes-

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sional things—skills and methods—during each project," she says. "I know that I am acquiring a small but useful set of tools. I am already finding I'm able to build on these tools from project to project to help me understand how to approach and analyze signal processing problems."

While the course will no doubt play a significant role in the future plans of such students as Greenberg, Keller and Lo, there is also a guiltier pleasure. As Greenberg puts it, "This course gives the student many opportunities to fiddle with expensive gadgets like pocket PCs and high-end digital cameras, which as an engineer, I find undeniably attractive."

New patents

Professor **Christopher Davis,** Saeed Pilevar (a former postdoc of Dr. Davis), Alexander Fielding (a former Ph.D. student of Dr. Davis) and Frank Portugal were issued U.S. Patent 6,558,958 for an "optical fiber evanescent field excited fluorosensor."

Professor **Kawthar Zaki** was awarded U.S. Patent 6,535,083 for an "Embedded Ridge Waveguide Filter." Dr. Zaki's co-inventors are Michael Hageman, John Gipprich and Daniel Stevens, Jr. The patent is assigned to Northrop Grumman Corp.

Professor **Mario Dagenais,** Faculty Research Assistant Madhumita Datta and Scott A. Meritt of Pinner, U.K., were issued U.S. Patent 6,506,672 for a "re-metallized aluminum bond pad."

Professor **K. J. Ray Liu,** Research Professor **Leandros Tassiulas** and Farrokh Rashid-Farrokhi, an alumnus of ECE, were issued U.S. Patent 6,377,812 for "combined power control and space-time diversity in mobile cellular communications."

Pamela Abshire, continued from page 1...

Biological systems are "remarkably efficient," Abshire says. She hopes to demystify their performance by studying the determinist and stochastic properties of the underlying biophysical technologies. "When we understand a biological system well enough to identify its engineering strategies, we can incorporate those strategies into our own designs."

Abshire became interested in this area as an undergraduate at the California Institute of Technology, where she received her bachelor's degree in physics with honors in 1992. "A course in analog integrated circuit design introduced me to the idea of physical computation, that we can use physical structures and processes to perform computing tasks."

Abshire worked for a biomedical device company in the pacemaker research department in signal processing, circuit design and sensing small signals of interest riding on large background signals. "This experience convinced me of the importance of efficient, low-power design techniques in enabling more sophisticated, autonomous engineered systems," she says. Abshire then returned to school and received her master's and Ph.D. degrees in electrical and computer engineering from Johns Hopkins University in 1997 and 2001, respectively. She holds a joint appointment with the Institute for Systems Research (ISR).

The NSF CAREER Award is significant because of "the sense of validation this award brings to the pursuit of physical efficiency as a field of study." Abshire is "absolutely ecstatic" to have received the award.

Learn more about Dr. Abshire at *www.ece.umd.edu/~pabshire/.*

Richard La, continued from page 1...

"My research will investigate various aspects of these problems," La says.

He first plans to develop "accurate and yet simple" traffic models for network provisioning and performance estimation. "Using these models, I will then try to develop network dimensioning/provisioning tools and pricing mechanisms. Developing good mathematical models for the problems of interest is not always easy. However, when a suitable model is developed and interesting and intuitive results are derived based on that model, it is a very satisfying experience."

La became interested in this field while taking a networking course as an undergraduate student at the Clark School. After graduating from the University of Maryland in 1994 with a degree in electrical engineering, his interest in networking continued as a graduate student at the University of California at Berkeley, where he received his master's and Ph.D. degrees in electrical engineering and computer science in 1997 and 2000, respectively. La currently holds a joint appointment with ECE and ISR.

The news of his NSF CAREER Award was especially rewarding, he says, because "it was my first time applying for it. I hope it provides me with an opportunity to further my research interests and helps me establish a sound research program."

Learn more about Dr. La at *www.ece.umd.edu/~hyongla/.*

Chellappa named Distinguished Teacher-Scholar

As an undergraduate student in India, **Rama Chellappa** knew that he wanted to teach someday. So he often practiced on his two younger and frequently unco-operative brothers. "They thought I was nuts," he says, laughing. "But I was imag-ining myself as a professor. I would write with chalk on the door of the house and practice what my first lecture would be like." After "ten minutes or so," his brothers would go run-ning to complain to their mother.

Rama Chellappa

But the practice must have paid off. For Chellappa would go on to become both a highly regarded teacher and researcher. His teaching skills recently have been acknowledged by the University of Maryland, which has honored him as a Distinguished Teacher-Scholar. Recipients of this honor are cho-sen based on peer reference, student com-ments and professional accomplishments.
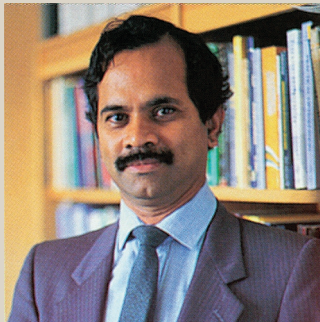
"I never bought into the idea that a researcher couldn't be a good teacher," says Chellappa, who joined the university in 1991. "I feel very strongly that by integrat-ing research into courses, one can maintain a high level of interest and enthusiasm among students. So, I discuss new research directions related to the course I am teach-ing with a lot of excitement and hope to get the students excited too."

Chellappa is serious about the respon-sibility he assumes when stepping into the classroom. "An hour or two before I teach, I don't talk to my staff or my students. I'm revising my notes. In 22 years of doing this, I've never felt that I could just walk into a class and teach. There is this edginess in getting prepared."

He compares preparing to teach a class to "getting ready for the opera. If you have a bad night or a bad class, the critics jump all over," he says. "My critics are my students."

Sometimes his classes do resemble a performance. "When I taught ENEE 322, I composed a song on doing 1-D convolu-tion to the tune of a catchy Sesame Street song," he recalls. "I sang it in class to help the students remem-ber. That got a big cheer from the students."

Chellappa received his master's and Ph.D. degrees in electrical engineering from Purdue University in 1978 and 1981, respectively. His research interests are in image processing and computer vision. He is the director of the Center for Automation Research (CfAR) and an affiliate of the Institute for Advanced Computer Studies (UMIACS).

Chellappa is a recipient of the NSF Presidential Young Investigator Award, an IBM Faculty Development Award, the 1992 Best Industry Related Paper Award from the International Association of Pattern Recognition, and the 2000 Technical Achievement Award from the IEEE Signal Processing Society. He also was named a Distinguished Faculty Research Fellow at the university. Chellappa is currently serving as editor-in-chief of IEEE's *Transactions on Pattern Analysis and Machine Intelligence*.

He received the Excellence in Teaching Award from the School of Engineering at the University of Southern California (USC), where he was on fac-ulty from 1981 to 1990. He recalls a time there when he received a standing ovation from students after his last lecture of a class on signals and systems. "I was told by the chairman that he had not heard of any such thing in all the years he had been at USC," says Chellappa. "I love teaching. I really do."

Learn more about Dr. Chellappa at his home page, *www.cfar.umd.edu/~rama/* or the CfAR web site, *www.cfar.umd.edu.*

Students on Dr. Chellappa

"He has an ability to train researchers rather than merely oversee research."

"In addition to providing key research direction, he ingrained in his students the ability to solve problems independently."

"Rama Chellappa is one of the best pro-fessors I have encountered in my educa-tion here at Maryland."

"My recollection of his classes is that there was never a dull moment."

"Each of his classes is an exploration to a challenging research area."

"His teaching style has been really tar-geted at training the next generation of first-class researchers."

"Enthusiasm is perhaps his most remark-able trait."

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studentNEWS

Xiaobo Tan and Michael Khbeis from Assistant Professor Reza Ghodssi's ENEE 719F class won one of two best poster awards at the Spring 2003 Special Topics Symposiums of the MEMS Alliance. Their poster was titled, "Microfabrication of a Pressure Sensor Array using 3D Integration Technology." The MEMS Alliance is a networking group of companies, universities and government laboratories in the Washington, D.C., metropolitan area.

Jean-Marie Lauenstein, an undergraduate student, was selected for the 2003 Barry Goldwater Scholarship. The Goldwater Scholarship is awarded on the basis of merit to students who have outstanding potential and intend to pursue careers in mathematics, the natural sciences or engineering.

Marcel Pruessner, a graduate student, was awarded one of three $15,000 ARCS Fellowships given by the Clark School for the 2003-2004 academic year. Pruessner is a student in the MEMS Sensors and Actuators Laboratory. His research focuses on optical switching and III-V MEMS.

Mohith Prakash Narayanan, a junior in computer engineering, won second prize in the Washington Society for Engineers Young Engineer Prize Paper Competition. His paper is titled, "Image Compression Using Wavelet Decomposition and Vector Quantization of Subband Coefficients."

Jonathan Neumann, a Ph.D. student, received the Best Student Paper Award at the Directed Energy Professional Society's fifth annual symposium. The award is in recognition of work relating to electron beam modulation in particle accelerators with application to THz sources, and is sponsored by Brashear LP, a major manufacturer of optical systems. Neumann also received the Ralph W. Shrader Master's Degree Scholarship from the Armed Forces Communications and Electronics Association. The $3,000 award is given to reward excellence of demonstrated effort at the master's level of study. Neumann won the award for his research on free electron lasers.

Graduate student Linda Wasiczko has been awarded a Selected Professions Fellowship from the American Association

of University Women (AAUW) Educational Foundation for the 2003-2004 fiscal year, one of only 34 such fellowships among many disciplines. The Fellowship carries a stipend of $20,000 for the year. Linda is pursuing a Ph.D. degree. Her research is on the effects of atmospheric turbulence and obscuration on the performance of high data rate optical wireless communication systems. Wasiczko is a student of Professor Christopher Davis.

Sean Andersson, a Ph.D. student, received a $15,000 scholarship from the Achievement Rewards for College Scientists (ARCS) Foundation, Inc. Andersson's research efforts are focused on the role of geometric phases in sensing and control and mobile robotics.

The work of graduate student Tao Jiang was recognized by Dr. Michael Andrews, the Department of the Army's Deputy Assistant Secretary for Research and Technology and Chief Scientist. Tao Jiang received a special coin in recognition of her outstanding exhibit, "Trust Evidence Distribution in Ad Hoc Networks," at the 2003 Collaborative Technology Alliances (CTA) Conference, May 1.

Graduate student Om Deshmukh won the Best Student Paper competition in Speech Communication at the 145th meeting of the Acoustical Society of America (ASA) in Nashville this April. His paper was titled, "A Measure of Aperiodicity in Speech Signals." His advisor is Associate Professor Carol Espy-Wilson.

Alireza Modafe, a Ph. D. student, was selected to receive the American Vacuum Society's (AVS) Graduate Research Award for 2002. One Graduate Research Award is given each year. The award was presented to Modafe at the AVS 49th International Symposium this past fall in Denver.

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faculty**NE**ws

Graduate student **Zoltan Safar** won the Institute for Systems Research George Harhalakis Outstanding Systems Engineering Graduate Student Award for 2003. His advisor, Professor **K.J. Ray Liu**, noted that Zoltan possesses a rare combination of strong skill and background in theoretical analysis and practical computer hardware and software implementation, as well as demonstrated teaching and leadership skills.

Two ECE graduating seniors won the Clark School of Engineering's Spring 2003 Engineering Honors Awards. **Jon Shalvi** won the Most Outstanding Research Award. His advisor is Assistant Professor **Min Wu**. **Alan Pressman** received the Honorable Mention Award in the same category. He is advised by Professor **Julius Goldhar**.

Graduate student **Matthew Cheely** and Assistant Professor **Timothy Horiuchi's** (ECE/ISR) paper, "A VLSI Model of Range-Tuned Neurons in the Bat Echolocation System," was selected as the Best Paper of the Sensory Systems Track at the International Symposium on Circuits and Systems (ISCAS) 2003. It was selected from some 65 papers. ▫

Kawthar Zaki recently was recognized as an honored pioneer in microwave engineering at the IEEE-sponsored Mediterranean Microwave Symposium held in Cairo, Egypt, in May. This award recognizes her contributions as a leader in microwave engineering throughout her career. Additional photos can be viewed at the conference web site. Dr. Zaki also organized a special NSF session at the IEEE International Microwave Symposium in Philadelphia, June 10.

Assistant Professor **Sennur Ulukus,** along with Chris Rose and Roy Yates of Rutgers University, has won the 2003 IEEE Marconi Paper Prize Award in Wireless Communications for the paper, "Wireless Systems and Interference Avoidance." This research appeared in *IEEE Transactions on Wireless Communications,* Vol. 1, No. 3, pp. 415-428, July 2002. The award is given by the IEEE Communications Society and will be presented at Globecom 2003 in San Francisco this December.

Professors **John S. Baras** and **Christopher Davis** (pinch hitting for Bioengineering Professor William Bentley) gave research-oriented presentations at the Clark School of Engineering's first Charles and Helen White Symposium, May 14.

Professor **Mario Dagenais** and Peter Heim, co-founders of Quantum Photonics, received the new Award for Entrepreneurship at the University of Maryland's annual Invention of the Year Reception. Quantum Photonics is a Maryland start-up company that recently merged with Coden Corp. to form Covega Corp. Dagenais and Heim, a former research associate at the university, started the Jessup, Md.-based company in 1998 to develop lower-cost, high-performance optoelectronic components to facilitate the flow of data through fiber optic networks. The base technologies were invented in the university laboratory of Dagenais and Heim. Professor **Isaak Mayergoyz** and students Chun Tse, Charles Krafft and Dragos Mircea were finalists in the physical science category for their invention, "High-Speed Massive Magnetic Imaging on a Spin-Stand." This is a new technique for the imaging of magnetic materials.

Professor **A. Yavuz Oruc** has been invited to serve on the editorial board of *IEEE Transactions on Parallel and Distributed Systems*, a research-oriented publication of the IEEE Computer Society. Oruc also gave a keynote speech on the role of the National Science Foundation in computer architecture research at the 35th Annual International Symposium on Microarchitecture (Micro-35) in Istanbul, Turkey, this past fall.

Professor **K. J. Ray Liu** has been elected as a IEEE Signal Processing Society 2004 Distinguished Lecturer. The IEEE Signal Processing Society elects six Distinguished Lecturers each year to represent the society by giving lectures about their research around the world. Liu has also been elected an IEEE Fellow for his "contributions to algorithms, architectures and implementations for signal processing." In addition, he became the editor-in-chief of *IEEE Signal Processing Magazine,* the most widely read journal in the signal processing community.

Professor **Virgil Gligor** has been named to Microsoft's new academic advisory board on Trustworthy Computing issues. The board comprises 14 professors from universities all over the world and includes some of the best-known names in computer security research. Microsoft officials say the group will be a sounding board, giving critiques and analysis on its Trustworthy Computing program.

Professor **Agis Iliadis** presented an IEEE Distinguished Lecture on "Self-Assembled Nanostructure Technology" this spring in Toronto. He was invited to give the talk by the IEEE Electron Devices Chapter. In January, Iliadis gave an invited talk on "Design and Development of Nanostructured IR Vertical Cavity Surface Emitting Lasers" at Photonics West, Optoelectronics 2003, Quantum Sensing Conference in San Jose, Calif. This was the result of collaborative work with Aris Christou of the Department of Materials and Nuclear Engineering.

Associate Professor **Manoj Franklin** received a 2003 IBM Faculty Award. The $20,000 award recognizes the quality of Dr. Franklin's work and its importance to industry.

Professor Emeritus **Martin Reiser** and alumnus Sami Tantawi have been awarded the U.S. Particle Accelerator School's (USPAS) Prize for Achievement in Accelerator Physics and Technology for 2003. USPAS is overseen by the Fermi National Accelerator Laboratory in Illinois.

Professor **Thomas Antonsen** has won the 2003 IEEE Plasma Science and Applications Award. The award is given by the IEEE Plasma Science and Applications Committee to recognize outstanding contributions to the field of plasma science in research or new applications. The award will be presented at the 2003 International Conference on Plasma Science this summer in Korea, where Antonsen will deliver an invited address.

Professor **Anthony Ephremides** recently presented a talk on "Energy-Saving Conflict Resolution in Ad Hoc Networks" as part of the Distinguished Lecture Series of the University of Illinois in Urbana. The talk was based on his joint work with student Yalin Sagduyu. Ephremides

also was asked to speak at Bell Labs in February and participated in another distinguished lecture at Notre Dame in March. Last fall, he was the keynote speaker at Mobicom 2002 in Atlanta. He spoke at the University of Washington in Seattle in June. Ephremides was one of only 18 University of Maryland faculty members inducted into the first class of Fellows for the university's new Academy of Excellence in Teaching and Learning.

Professor **Jon Orloff** and Physics Professor Alex Dragt organized the sixth International Conference on Charged Particle Optics in Greenbelt, Md., this past fall. The conference is held every four years and attracts people from all branches of charged particle optics, including accelerator physics, fundamental optics, electron microscopy and electron and ion sources.

Professor **John Baras** and graduate students Alvaro Cardenas and Vahid Ramezani won the Best Paper Award in IT/C4ISR (Information Technology, Information Technology/Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance) at the 23rd Army Science Conference in Orlando, Fla., this past December. Their paper was titled, "On-Line Detection of Distributed Attacks From Space-Time Network Flow Patterns."

Professor **David Barbe,** the executive director of the Maryland Technology Enterprise Institute (MTECH) was awarded the American Society of Engineering Education's Outstanding Entrepreneurship Educator Award. Barbe received this award in recognition of his leadership and innovation in engineering and high-technology entrepreneurship education and for the breadth and impact of the Hinman CEOs, the Business Plan Competition, the Technology Start-up Boot Camp and the VentureAccelerator Programs.

Assistant Professor **Reza Ghodssi**, who holds a joint appointment with the Institute for Systems Research (ISR), won ISR's Outstanding Faculty Award for 2003.

Faculty books

Associate Professor **Steven Tretter** has written two new books. *Communication System Design Using DSP Algorithms with Laboratory Experiments for the TMS320C6701 and TMS320C6711* explores the theoretical concepts of digital signal processing and communication systems through laboratory experiments using real-time DSP hardware. The book has been published by Kluwer Academic Publishers as part of its Information Technology: Transmission, Processing and Storage series. *Constellation Shaping, Nonlinear Precoding, and Trellis Coding for Voiceband Telephone Channel Modems,* also published by Kluwer, focuses on the theory behind the modulation and coding techniques included in ITU-T Recommendation V. 34.

High Resolution Focused Ion Beams: FIB and Applications, by Professor **Jon Orloff,** Lynwood Swanson of the FEI Company in Oregon and Mark Utlaut of the University of Portland, was recently published by Kluwer. The book is a theory and applications reference on high resolution focused ion beams (FIBs) and is useful for the user and designer of FIB instrumentation.

The third edition of *Building Scientific Apparatus* by Professor John H. Moore of the Department of Chemistry and Biochemistry, Professor **Christopher Davis** and Research Professor Michael A. Coplan of the Institute for Physical Science and Technology, was recently published by Westview Press. It is a practical guide for working scientists and students who design and construct scientific equipment.

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alumni news

Pati and Hinman honored at University of Maryland Gala

ECE alums **Y.C. Buno Pati** and **Brian Hinman** were honored at the University of Maryland's Fourth Annual Alumni Association Awards Gala this spring. Pati and Hinman were recognized for their outstanding achievements and demonstrated success.

Pati, who received his bachelor's, master's and Ph.D. degrees in electrical engineering from the university, received the Clark School's 2003 Distinguished Alumnus Award for his contributions to the field of engineering and the advancement of technology.

Pati has become one of the world's leading innovators in semiconductor manufacturing processing technology. In 1995, he founded Numerical Technologies and served as its president and CEO until August 2002. He led Numerical from its initial development phases through its successful initial public offering in April 2000, and completed three successful acquisitions. Pati led product development, marketing and sales for software and technology products that span the design-to-silicon spectrum and cover the semiconductor manufacturing, photomask and IC design markets.

Before Numerical, Pati was an assistant professor of electrical engineering and computer science at Harvard University. Prior to that, he led a research group at Stanford University that developed the original technology for Numerical.

Pati now serves on the board of directors of Brion Technologies and the Clark School of Engineering's Board of Visitors.

Hinman, who received his bachelor's degree in electrical engineering in 1982 from Maryland, was the recipient of the Ralph J. Tyser Medallion for providing unique and significant service to the university.

Hinman holds 11 U.S. patents and has been honored as one of the nation's most successful entrepreneurs. At age 22, he co-founded PictureTel Corp. and served as its director and vice president of engineering from 1984 through 1990. Today, as president and CEO of 2Wire, which he founded in 1998, he leads the nation's largest provider of DSL home networking equipment. Hinman was also the co-founder and former CEO of Polycom, Inc., the world's top teleconferencing equipment company.

In 1999, Hinman's gift of $2.5 million to the University of Maryland established the Hinman Campus Entrepreneurship Opportunities (CEOs) program. This program offers a residential setting for upperclassmen where they can develop ideas for starting businesses in an experiential learning environment.

Hinman is a member of the Clark School Board of Visitors and the University of Maryland College Park Foundation Board of Trustees.

Notes from our alumni

Radha Poovendran, an ECE alumnus and now assistant professor in the Electrical Engineering Department at the University of Washington, won the Army Research Office's Young Investigator's Program award for "Information Assurance for Energy Constrained Wireless Sensor Networks." Poovendran's award is in the technical area of "Information Assurance and Survivable Communications." According to Poovendran, this is the first time that someone in the University of Washington system has received the award. Poovendran also recently received his department's Outstanding Teaching Award as well as the Outstanding Graduate Advisor Award. It was the first time both awards were given to the same faculty member.

Nikolaos Kanlis, who received his Ph.D. in 2002, accepted an offer from Texas A&M, Kingsville, as an assistant professor.

Hamid Jafarkhani, who received his Ph.D. in 1997, recently joined the Department of Electrical and Computer Engineering at the University of California, Irvine.

Jie Chen, who received his Ph.D. in 1998, accepted an offer from Brown University as an assistant professor.

Hua O. Wang, who received his Ph.D. in 1993, accepted an offer to join Boston University's Department of Aerospace and Mechanical Engineering as an associate professor with tenure. Prior to this, he was an assistant professor of electrical and computer engineering at Duke University and also program director for systems and control at the Army Research Office in Durham, N.C.

Murphy and Srivastava are new assistant professors

Thomas E. Murphy and **Ankur Srivastava** have joined the department faculty as assistant professors. Both feel the A. James Clark School of Engineering will offer them significant advantages as they begin their careers as instructors and researchers. "The Clark School is a great place for a young faculty member to build a career," says Murphy. Srivastava agrees. "This is a top-20 school with a great infrastructure and students who are among the best in the world."

Murphy studied physics and electrical engineering at Rice University, graduating summa cum laude with joint BA/BSEE degrees in 1994. That same year, he joined the NanoStructures Laboratory at MIT, where he pursued research in integrated optics and nanotechnology. "I remember being impressed with how one could develop mathematical models that very accurately describe observed optical phenomena," he recalls. "I have always found a special satisfaction in finding agreement between measured data and analytical models, and I think that this has guided my work as a scientist."

Murphy completed his master's degree in 1997 and his Ph.D. in 2000, then joined the MIT Lincoln Laboratory as a staff member in the optical communications technology group. There, he studied and developed ultrafast optical communications systems. In 1994, he was awarded a National Science Foundation fellowship for graduate research and in 2000 he and his colleagues received the Lemelson-MIT student team prize for innovation in telecommunications and networking.

Murphy's research interests include optical communications, short-pulse phenomena, numerical simulation, optical pulse propagation, nanotechnology and integrated photonics. "My research is broadly concerned with photonics and optical communications at the physical layer," he says. "I am especially interested in nonlinear optical processes in fiber and integrated devices, and how we might take advantage of these processes in next-generation optical networks. Although fiber optic communications has enjoyed tremendous growth in the past decade, I still believe that much can be done to utilize available resources more efficiently."

As a faculty member his goals are "to continually learn new things, develop an innovative research program and laboratory facility, and help train the next generation of young scientists."

Srivastava received his bachelor's degree from the Indian Institute of Technology in Delhi in 1998; his master's in computer engineering at Northwestern University in 2000; and his Ph.D. in computer science from UCLA in 2002. While at UCLA, Srivastava received the outstanding Ph.D. award for his thesis on "Methodologies for Predictability Optimization in VLSI Systems."

Srivastava's research focus is in computer engineering, with a particular emphasis on VLSI Design, VLSI CAD, embedded systems and high-level synthesis. "Around my senior year I did some research on VLSI CAD and also published it," he says. "I liked the algorithmic/mathematical/optimization aspect of CAD, and I also liked the practicality of the field, as opposed to pure mathematics where everything is very abstract. That's why I chose CAD as my area of research."

Srivastava says he became intrigued with the idea of research as he began graduate school. "Research enthralled me," he says. "It whetted my appetite for perfectionism. Algorithms always posed a magnetic challenge and the applicability of algorithms to VLSI CAD make them even more interesting."

He also finds much satisfaction in working with students who are often not much younger than himself. "I enjoy working with young and enthusiastic minds," he says. "The relationship between a student and advisor is very pure. I like that. I hope to develop a full-fledged program in my area of research. And I think I can."

You can learn more about Thomas Murphy at *www.ece.umd.edu/~tem/* and Ankur Srivastava at *www.ece.umd.edu/~ankurs/*.

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Eyad Abed named ISR director

ECE Professor **Eyad Abed** has been named the director of the Institute for Systems Research (ISR). Abed, who joined the university in 1983, has an impressive record of scholarly accomplishments in control systems. His research includes contributions to the control of nonlinear systems exhibiting bifurcation and chaos, singular perturbation analysis and reduced-order modeling, nonlinear stability and stabilization, linear robust stability, gas turbine jet engine dynamics and control, electric power system dynamics and control, tethered satellite control, aircraft control and radar system dynamics.

Dean Nariman Farvardin said, "Dr. Abed will be a strong advocate for the ISR and a leader in organizing the efforts of the institute to launch new and exciting research and educational programs and in strengthening the ties between the institute and various external constituencies."

Abed is a Fellow of the IEEE and received the National Science Foundation Presidential Young Investigator Award; the O. Hugo Schuck Best Paper Award from the American Automatic Control Council; ISR's Outstanding Systems Engineering Faculty Award; the Naval Research Laboratory's Alan Berman Research Publication Award; and two teaching awards from the university. He is also on the advisory editorial board of *Nonlinear Dynamics*.

Abed earned a bachelor's degree from MIT in 1979 and his master's and Ph.D. degrees at the University of California at Berkeley in 1981 and 1982, all in electrical engineering. ▣

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