Sirius Co-Founder and Alumnus Briskman Honored for Innovation

ECE alumnus **Robert Briskman** (M.S. '61, electrical engineering), co-founder of Sirius Satellite Radio, was inducted into the A. James Clark School of Engineering Innovation Hall of Fame on October 21, 2010.

Briskman was honored for creating the innovative technologies, formally known as Satellite Digital Audio Radio Service (SDARS), that enable efficient satellite transmission of continuous radio programming to mobile and fixed receivers. Operational across the continental U.S. and much of Canada, the SDARS system achieves near perfect availability across enormous geographical areas, using ground "repeaters" to complete communications in the less than one percent of the service area without clear satellite coverage.

During 1996-2000, Briskman designed and built three of the most powerful commercial broadcast satellites of the time, each producing two megawatts of radiated power, and launched them into a "figure 8" geosynchronous orbit over the Americas. Briskman devised this unique elliptical orbit to achieve the highest possible elevation angle of the satellites to the mobile receivers, minimizing signal outages.

ROBERT BRISKMAN & PAT O'SHEA

To build and implement the service, Briskman co-founded Sirius Satellite Radio. The result was the first major development in radio in decades, providing subscription-based, advertising-free radio programming that was consistent across the country. Today the company, headquartered in Manhattan's Rockefeller Center, claims 19.5 million subscribers in the U.S. and double-digit revenue growth over the second quarter of last year. Sirius is well known for its famous entertainers, including **Howard Stern, Martha Stewart, Bob Dylan** and **Tom Petty**.

After Briskman's induction ceremony, the White Symposium on Engineering Innovation featured a range of guests involved in satellite communications technology, including **Abby Sunderland**, one of the youngest people to attempt to sail around the world, who was rescued with the aid of satellite technology.

greatEXPECTATIONS

Contribute to the department through the University of Maryland's Great Expectations campaign and support our mission to transform lives through exceptional educational and research opportunities. Please visit www.greatexpectations.umd.edu to learn more.

Gifts may be made by check to "University of Maryland College Park Foundation (UMCPF)." Please designate "The Department of Electrical and Computer Engineering" in the memo line, and mail to:

Ted Knight
Electrical and Computer Engineering Department
2457 A.V. Williams Building
University of Maryland, College Park, MD 20742

You can help make a difference with a gift of any amount!

CONNECTIONS is published for alumni and friends of the Department of Electrical and Computer Engineering at the A. James Clark School of Engineering, University of Maryland.

Your alumni news and comments are welcome. Please send them to: Ted Knight, ECE Department, 2457 A.V. Williams Building, College Park, MD, 20742. Visit our web site at: **www.ece.umd.edu**

Department Chair: Dr. Patrick O'Shea
Editor: Ted Knight
Assistant Editor: Jess Molina
Photography: J. Molina, A. Santos, J. Consoli

A. JAMES CLARK
SCHOOL OF ENGINEERING

Department of Electrical and Computer Engineering
2457 A.V. Williams Building
University of Maryland
College Park, MD 20742

FALL/WINTER 2010

CONNECTIONS

DEPARTMENT of ELECTRICAL & COMPUTER ENGINEERING
A. JAMES CLARK SCHOOL of ENGINEERING
www.ece.umd.edu

ARE YOU CYBER SECURE?

The University of Maryland launches the new Maryland Cybersecurity Center (MC^2), *p. 4*

IN THIS ISSUE:

INNOVATOR OF THE YEAR
PROF. CAROL ESPY-WILSON LAUNCHES A NEW COMPANY FOR SPEECH EXTRACTION TECHNOLOGY, *p. 6*

PRESIDENTIAL MATERIAL
PROF. EDO WAKS RECEIVES THE PRESIDENTIAL EARLY CAREER AWARD FOR SCIENTISTS AND ENGINEERS (PECASE), *p. 9*

THE TRAVELING ENGINEER
PROF. LEN TAYLOR RIDES THE SHANGHAI MAGLEV TRAIN, *p. 13*

FANTASTIC FELLOWS
GALLOWAY, ROPP AWARDED L-3 GRADUATE RESEARCH FELLOWSHIPS, *p. 17*

message from the chair

PATRICK O'SHEA

CYBER THREAT REQUIRES MORE THAN TECHNICAL SOLUTIONS

They come in the night, hit you on the head and steal your stuff.

That was the main concern of our ancestors, who developed physical defenses, weapons, and walls that provided temporary security. As our societies became more sophisticated, they began to understand that the broad assurance of our security was more important than simple measures to address physical security. Assurance involves moral, ethical, behavioral, social, legal, economic, and technical protections. History has shown that technical solutions alone have not and will not provide comprehensive security assurance.

This same truth applies to the emerging field of cybersecurity, and the threats that our nation and the international community currently face. In the wake of the recent Stuxnet worm, the general public is becoming increasingly aware that vulnerabilities to cyber attacks could lead to significant disruptions in telecommunications, data storage, banking, utilities, and transportation services, and threaten the general stability of our modern society.

As we work together to address the cyber threat, we must understand that IT solutions alone will fail to give us "cyberassurance." Achieving comprehensive assurance requires an approach that brings together perspectives related to economics, criminology, business, sociology, policy, science and technology. This holistic approach to the problem will also benefit from innovative collaborations between the public and private sectors, and partnerships that bring together experts in government, academia and industry.

In October, the University of Maryland announced the creation of the Maryland Cybersecurity Center (MC^2) to promote this comprehensive approach to cybersecurity education, research and technology development, stressing "more-than-tech," interdisciplinary solutions. Researchers from engineering, computer science, economics, public policy and the social sciences will combine their efforts to help develop a new framework for cyberassurance.

For a field as new and ever-changing as cybersecurity, we must also adopt a unique approach to education. Cybersecurity as an academic research and education activity is far from well-defined. We do not know the what, where, when, how or why of the next cyber attack. The kinds of issues we will be concerned with in five years are not yet named today. The future is uncharted territory.

Therefore, there is a critical need for graduates who are trained as explorers and not as tourists. In a tourist style education, students are trained in defined skills that are applied to a limited set of well-understood problems. Tourists learn from textbooks with organized homework assignments. An explorer goes beyond the map into terra incognita. An explorer is comfortable in the fog of uncertainly and ambiguity. An explorer creates order out of chaos. We must expect students to travel "off the map," to delve into new, unchartered areas. We must arm students with a sense of courage and discovery.

MC2 will help produce graduates who are explorers to help establish a new framework for cybersecurity assurance.

CLARK SCHOOL RANKS 3RD NATIONWIDE IN *WSJ* RECRUITER SURVEY

The Wall Street Journal published its first "Top 25 Recruiter Picks" survey, which identifies those universities from which large employers most heavily recruit graduates to fill entry-level jobs. In the survey, the University of Maryland is ranked 8th in the nation, and the A. James Clark School of Engineering is ranked 3rd among all engineering programs nationwide.

According to the *Journal*, the survey queried 479 of the largest public and private companies, nonprofits and government agencies in the U.S. Further, "The *Journal* research represents a systematic effort to assess colleges by surveying employers' recruiters—who decide where to seek out new hires—instead of relying primarily on measures such as student test scores, college admission rates or graduates' starting salaries." The complete survey results can be viewed on the *Wall Street Journal* website, www.wsj.com.

CLARK SCHOOL EARNS HIGH RANKINGS FROM *U.S. NEWS*, ARWU

The Clark School of Engineering earned national and international recognition in two recent academic program rankings.

Shanghai Jiao Tong University's Institute of Higher Education and Center for World-Class Universities ranked the Clark School 13th in the world among all engineering programs in its Academic Ranking of World Universities (ARWU). Among all public university programs, the Clark School was ranked 8th. The ranking is purely objective based on quantitative measures of productivity with no reputation component.

The 2011 *U.S. News and World Report*'s Best Colleges survey ranked the Clark School's undergraduate program 19th in the nation among all engineering programs. Among public programs, the Clark School ranked 9th.

UMD, Lockheed Martin Launch Strategic Relationship

The University of Maryland and Lockheed Martin Corporation opened a major new chapter in their more than 60-year history with the estabishment of a unique, strategic relationship between the two institutions.

A SIGNING CEREMONY TOOK PLACE LAST JUNE.

The new agreement provides a strategic framework for current and future cooperation that leverages the resources, talent, and ideas of both institutions to produce innovative solutions for global and national security challenges. The agreement provides for work in three key areas: Centers of Collaboration, Joint Pursuit of Business Opportunities, and Enhanced Research and Development. The initial Lockheed Martin commitment is a minimum of $1 million per year for three years. However, officials from both organizations agree that the relationship is expected to grow in terms of both collaboration and investment.

"The University of Maryland is thrilled to be formalizing our long-term partnership with Lockheed Martin Corporation. Our combined strength will provide capacity for innovation needed to respond to complex global issues and national security challenges," said President **C.D. Mote**, Glenn L. Martin Institute Professor of Engineering.

"Lockheed Martin's strategic relationship with the University of Maryland leverages the best talent and ideas from both institutions to produce innovative solutions for our future," said Dr. **Ray O. Johnson**. "This partnership represents Lockheed Martin's commitment to its community and future workforce, and it represents a strategic business partnership that demonstrates the power of collaboration between industry, academia, and the government."

Dr. **Patrick O'Shea**, chairman of the Clark School's Department of Electrical and Computer Engineering, will oversee the strategic relationship created by the agreement along with **Bruno Evans** of Lockheed Martin.

A key part of the new strategic relationship is the creation of Centers of Collaboration, which will support sustained cooperative work in mutually agreed-upon areas - initially logistics and sustainment, climate change, and cybersecurity. The first of these, the Center for Logistics and Sustainment, has already been launched under the direction of Maryland's **Jacques Gansler**, who is the first holder of the university's Roger C. Lipitz Chair in Public Policy and Private Enterprise.

Lockheed Martin previously supported research at the University of Maryland in a number of areas, including work on laser plasma filaments that can enhance multiple applications of high-power laser beams and research in cultural modeling that can help troops perform better in unfamiliar environments.

NIST Awards NanoCenter $15 Million to Support Nanotechnology Research

The National Institute of Standards and Technology (NIST) has awarded a five-year cooperative agreement totaling $15 million to the Maryland NanoCenter at the University of Maryland to develop and implement a Postdoctoral Researcher and Visiting Fellow Measurement Science and Engineering Program. The effort is being led by PI and Department of Physics professor **Daniel P. Lathrop** and also includes co-PI and Electrical and Computer Engineering assistant professor **Edo Waks**, as well as Materials Science and Engineering assistant professors **John Cumings** and **Oded Rabin**.

The award extends and expands an existing cooperative agreement between the two institutions that was begun in 2006 with a $1.5 million competitively awarded grant. The program for postdoctoral researchers and visiting fellows is one of many collaborative efforts developed between the institutions since they signed a broad agreement in 2003 to expand research collaborations and professional linkages.

According to NIST, this new award will provide as many as 100 researchers with one- to two-year appointments at the NIST Center for Nanoscale Science and Technology (CNST). Visiting researchers supported by the cooperative agreement will aid in the development of measurement and fabrication methods, standards and technology in a wide range of areas including future electronics; nanofabrication and nanomanufacturing; energy transport, storage, and conversion; and bionanotechnology.

"We are very pleased to have this latest NIST-CNST agreement," said Lathrop. "Nanoscience cooperation between the University of Maryland and NIST has never been stronger."

In addition to providing new research opportunities for U.S. industrial, university, and government scientists, the funding will provide training for the next generation of nanotechnologists by offering recent Ph.D. grads postdoc research opportunities to work with CNST project leaders and have access to a state-of-the-art nanofabrication facility, the NanoFab.

New UMD Cybersecurity Center Stresses 'More-than-Tech' Solutions

The University of Maryland launched a new cybersecurity initiative that aims to stimulate public-private partnerships and address national vulnerabilities, including those facing industry. The idea is to help "connect the dots" in the region's burgeoning federal and private cyber sector.

The focal point of the initiative, the new Maryland Cybersecurity Center (MC^2), will adopt a holistic approach to cybersecurity education, research and technology development, stressing comprehensive, interdisciplinary solutions. MC^2 will bring together experts from engineering and computer science with colleagues from across campus in fields such as information sciences, business, public policy, social sciences and economics to develop new educational and research programs. It will also draw on the university's technology commercialization resources.

"The nation's information systems have outgrown our ability to assure their security, and no one institution or sector can undertake a task of this magnitude alone," said **Nariman Farvardin**, provost and senior vice president for academic affairs. "As one of the nation's top research universities, and with our strategic location, we are perfectly positioned to provide the education, expertise and collaboration that will help advance national and regional cybersecurity efforts."

The university's proximity to the nation's capital and close interactions with key federal agencies make College Park a unique place for cybersecurity education, research and technology development. Maryland leads the nation in information technology jobs, while more than half of the nation's internet traffic passes through the Washington, D.C., metropolitan area.

The MC^2 initiative will build on growing national and state commitments to address critical vulnerabilities of U.S. information systems.

"Cybersecurity is one of the biggest threats facing our nation, but also one of the greatest opportunities for Maryland universities, businesses and federal labs to work collectively and strengthen our national defense and economic security," said Gov. **Martin O'Malley**, whose CyberMaryland plan envisions the state as the "epicenter" of work in the field. "This bold initiative will complement the work of CyberMaryland, and I look to it as a national model for developing a response to the threat of cyber disruptions."

Sen. **Barbara A. Mikulski**, chairwoman of the U.S. Senate's Commerce, Justice and Science Subcommittee and a member of the Cyber Security Task Force agreed.

"The University of Maryland initiative is so important in our war against cyber terrorists, cyber thugs and cyber thieves," Sen. Mikulski said. "Maryland is the global epicenter for cyber security, and the University of Maryland will play a key role in training the cyber warriors of tomorrow. The center will bring new economy jobs to Maryland and help keep America safe."

MC^2 will draw on extensive cybersecurity research already underway at the university, including wireless and network security, cryptography, secure programming, mechanisms for ensuring citizens' privacy in social networks, cyber supply chain research, attacker behavioral analysis, cybersecurity policy, multimedia forensics, and the economics of cybersecurity, among other areas.

The research will have applications in the commercial world, as well as in

national security. The center's work will have special relevance for health care IT, where privacy is vital; as well as the utility, telecommunications and banking sectors, which are particularly vulnerable to electronic disruptions. MC^2 researchers will also focus on helping manufacturers assure the integrity of software and hardware components they buy from suppliers.

University of Maryland students will participate in MC^2 research, which will help prepare them for employment in the field. Additional graduate and undergraduate educational programs that emphasize unique, hands-on experience in cybersecurity systems will augment current courses.

"While there's a shortage of qualified workers in a rapidly growing field like this, the most acute need is for graduates with advanced degrees and very high skill sets," Farvardin said. "We're particularly well equipped to help meet this need."

Initially, MC^2 will be led jointly by Chairman of the Department of Electrical and Computer Engineering **Patrick O'Shea** and Chairman of the Department of Computer Science **Larry Davis**. A national search is underway to hire a permanent director.

The university is beginning to line up private sector research partners to work with the center, including Lockheed Martin and Science Applications International Corporation (SAIC).

"The University of Maryland is a highly valued academic partner in this critical area of cybersecurity innovation and research," said **Ted Campbell**, Lockheed Martin vice president of advanced concepts. "MC^2 will play an important role in the national cyber effort, which will benefit greatly from industry, academia and government collaboration."

"With this new center, we and the university will enjoy a new platform for cyber innovation," added **Larry Cox**, SAIC senior vice president and business unit general manager. "By linking our efforts, we can strategically support key initiatives of importance – not only to our organizations, but to the nation. Areas such as cyber supply chain research, accredited testing and evaluation, cloud computing security, and cyber defense education and training."

Additionally, MC^2 will work with small businesses, drawing on the university's extensive programs for technology development and commercialization, including the Maryland Technology Enterprise Institute and the Office of Technology Commercialization, to help bring new technologies to the marketplace and bring new economic growth to the region.

The Maryland Department of Business and Economic Development has also pledged its cooperation. "This initiative adds a great cyber asset to the state," said **Adam Suri**, director of cybersecurity and the Office of Innovative Technologies for the Maryland Department of Business and Economic Development. "Public-private-academic partnerships will further CyberMaryland, and we look forward to working closely with university on this project."

For more information about MC^2, visit **www.cyber.umd.edu**.

UMD Designated as U.S. Intelligence 'Center of Excellence'

The University of Maryland has been designated an Intelligence Community "Center of Academic Excellence" by the U.S. government - the first higher education institution in the state to be selected for the program, and one of only 14 universities participating nationwide.

The program provides funding to enhance Maryland's ability to prepare students for government service and leadership positions in the Intelligence Community: $300,000 dollars annually for up to five years.

The designation further aligns Maryland's flagship research university with the state's cyber security strategic plan announced recently by Governor Martin O'Malley designed to make Maryland the national epicenter for cyber security.

As a Center of Academic Excellence, the University of Maryland will fortify instruction and create new educational opportunities and internships in a broad range of areas, from information and cyber security to foreign language acquisition, cross-cultural studies, mathematics, physical sciences and engineering.

The Office of the Director of National Intelligence coordinates the Centers of Academic Excellence program, and particularly seeks to encourage minority students to pursue careers in national security professions. Scholarship Programs.

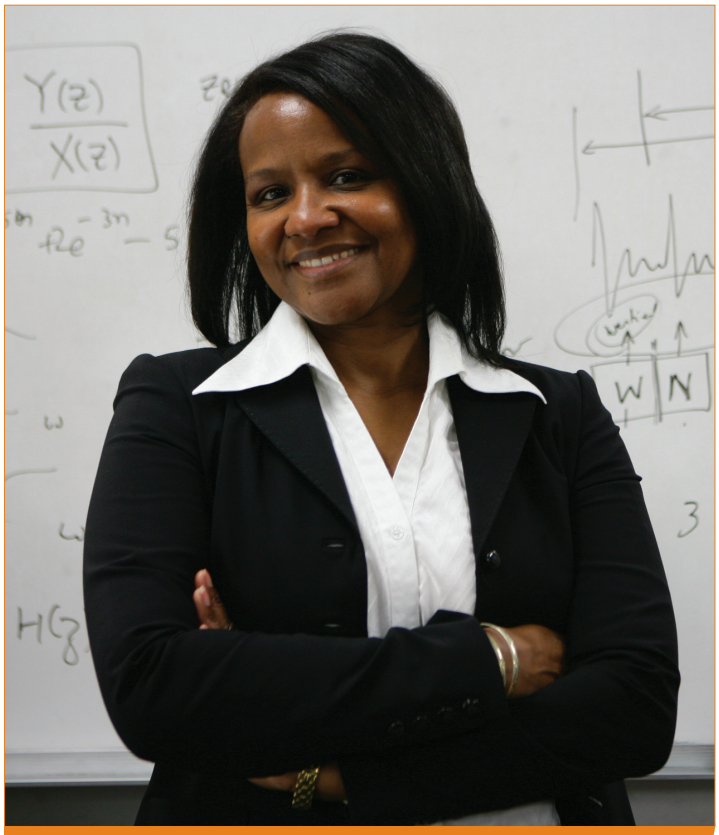
The program will leverage a number of University strengths - the proximity of various federal agencies, existing research partnerships with these agencies, and strong existing educational and research programs related to national security. A particular area of strength is in Information and Cyber Security. The University of Maryland is currently engaged in extensive research in engineering, as well as business management of cyber security resources and public policy issues. Maryland was recently designated by the National Security Agency (NSA) and Department of Homeland Security (DHS) a National Center of Academic Excellence in Information Assurance Research.

Espy-Wilson Receives Honors and Award for Innovative Speech Extraction Technology

Technology Eliminates Background Noise in Cell Phones, Speech Communications

Prof. **Carol Espy-Wilson** has received several honors and awards, including being named 2010 Maryland Innovator of the Year by the *Maryland Daily Record*, for her invention that radically improves sound quality over cell phones and in hearing aids, among other devices.

The technology addresses a problem familiar to anyone who has used a cell phone in a public place: background noise. Espy-Wilson's novel algorithm "cleans up" speech by separating the voices of the primary speakers from their noisy environments. It additionally can be used to improve sound quality in hearing aids, for military sniper and subject identification, and in teleconferencing.



ESPY-WILSON'S OMNISPEECH LLC IS MARKETING THE NEW TECHNOLOGY

"We have a disruptive technology that can benefit the entire cellular communications industry and dramatically improve assistive devices," said Espy-Wilson.

Previous technologies work by taking in all of a sound and then attempting to filter out anything that is not speech. OmniSpeech is the first company to look at this problem from the other perspective, that is, of "pulling the speech out of the noise" and extracting the clean speech signal from interfering noise signals.

"We don't focus on the noise at all," she explained. "We focus on the speech."

The company's technology uses a single standard microphone and a physiologically realistic model of how the ear detects tones to extract speech from noise. The noise can be stationary or non-stationary, it can come from any direction, and it can even be the speech of a competing talker. OmniSpeech's solution is architecture-agnostic, cost-effective, and can be integrated into the existing handsets or added to the firmware through an over-the-air upgrade.

Espy-Wilson founded her company, Omnispeech LLC, to bring the new technology to the marketplace. She is chief technology officer.

Prof. Espy-Wilson and her former student, ECE researcher and alumnus **Tarun Pruthi** (Ph.D., '07), won the "High Technology Category" of the 2010 University of Maryland Business Plan Competitiion, hosted by the Maryland Technology Enterprise Institute (Mtech) last April. Espy-Wilson and Pruthi won a $40,000 prize for their OmniSpeech presentation.

The technology behind Omnispeech also won the University of Maryland's 2010 "Invention of the Year Award."

OmniSpeech won the 2010 $50,000 SAIC-VentureAccelerator Competition. Mtech's VentureAccelerator is a fast-track program that guides faculty and student technology entrepreneurs in rapidly developing companies based upon their inventions.

Espy-Wilson also won the grand prize in the Rockville Economic Development Inc. (REDI) StartRight! Women's Business Plan Competition. Winners were recognized at a ceremony on July 21 at the Sphinx Club at Franklin Square in Washington, D.C. OmniSpeech was selected from among 52 applicants and nine semifinalists, who made investor presentations before a panel of judges.

"OmniSpeech stood out based on the uniqueness of the speech extraction approach, which is very different than noise suppression technologies that are already on the market," said **Lynne Benzion**, associate director for REDI. "The judges also valued the fact that the product design fits with existing cell phone architecture, making it easy to adopt."

New Research Grants for ECE Faculty

ULUKUS RECEIVES NSF GRANT FOR WIRELESS SECURITY RESEARCH

Prof. **Sennur Ulukus** is principal investigator (PI) for a four-year, $1.1 million National Science Foundation (NSF) grant for her research, titled "Interactive Security." This is a joint grant with Prof. **Aylin Yener** of Penn State University and Prof. **Kannan Ramchandran** of the University of California, Berkeley. The researchers aim to secure wireless communication channels in the physical layer using techniques from information theory, communication theory, and signal processing.

BARAS WINS $2 MILLION NSF GRANT FOR CYBER-PHYSICAL SYSTEMS RESEARCH

Prof. **John Baras** is co-PI on a National Science Foundation award, "Science of Integration for Cyber-Physical Systems." The $2,019,300, one-year award is part of a continuing grant in this area. The project is contributing to the cost effective development and deployment of many safety and security-critical cyber-physical systems, ranging from medical devices to transportation, to defense and avionics. **Researchers from** Vanderbilt University are also involved in the project.

SRIVASTAVA RECEIVES GRANT FOR THERMAL MANAGEMENT IN DATA STORAGE CENTERS

Prof. **Ankur Srivastava** is a Co-Principal Investigator (Co-PI) on a new National Science Foundation (NSF) research grant, titled "Optimization Algorithms for Large-scale, Thermal-aware Storage Systems." Dr. **Samir Khuller** of the University of Maryland's Department of Computer Science (CS) is the Principal Investigator on the grant, while Dr. **Amol Deshpande** (CS) will also serve as a Co-PI. The three-year grant is worth over $900,000.

MARTINS, ABSHIRE, SMELA, BERGBREITER WIN $1.5 MILLION NSF GRANT

A team of Clark School faculty from the Institute for Systems Research, the Electrical and Computer Engineering Department and the Mechanical Engineering Department won a three-year, $1.5 million National Science Foundation grant for Ant-Like Microrobots—Fast, Small, and Under Control. Prof. **Nuno Martins** is the principal investigator. Co-PIs are Prof. **Pamela Abshire,** Prof. **Elisabeth Smela**, and Prof. **Sarah Bergbreiter**.

ECE FACULTY PARTICIPATE IN DOD MURI RESEARCH PROJECTS

ECE faculty members are involved in three Multidisciplinary University Research Initiatives (MURIs) recently announced by the U.S. Department of Defense (DoD).

Prof. **Timothy Horiuchi** and Prof. **Sean Humbert** are participating in an Office of Naval Research (ONR) MURI, "Animal Inspired Robust Flight with Outer and Inner Loop Strategies." Their research will combine experimental biological analysis with a mathematical framework and control algorithms to develop a single-chip sonar for autonomous unmanned aircraft systems. Maryland's portion of the grant is $1.48M. The University of Washington, Boston University and the University of North Carolina are also involved in the research.

Prof. **John Baras** is participating in an Air Force Office of Scientific Research (AFOSR) MURI, "Multi-Layers and Multi-Resolution Networks of Interacting Agents in Adversarial Environments." Maryland's portion of this grant is $700K. Researchers from the University of Maryland, University of Illinois, Urbana-Champaign, Stanford University and University of California, Berkeley will develop systematic methods for multi-agent and networked control, which will further the idea of rapidly-mobile, multi-vehicle, unmanned aerial vehicle networks that can provide situational awareness on both a tactical and strategic scale.

Prof. **Rama Chellappa** and Prof. **Larry Davis** are involved with a MURI titled "Rich Representations with Exposed Semantics for Deep Visual Reasonings." The MURI funding will support researchers at Carnegie Mellon University, University of Maryland, University of Illinois, Urbana-Champaign, and University of Pennsylvania. The objective of this MURI is to develop techniques that can explain images and videos in common sense terms, interact with human operators, and adapt to new missions.

JACOB PART OF RESEARCH TEAM AWARDED DARPA UHPC GRANT

Prof. **Bruce Jacob** is part of a team selected by the Defense Advanced Research Projects Agency (DARPA) to develop new supercomputer prototype systems for DARPA's Ubiquitous High Performance Computing (UHPC) program. The 4-year, $25.8M award will fund research at the University of Maryland, Louisiana State University, University of Illinois at Urbana-Champaign, University of Notre Dame, University of Southern California, Georgia Institute of Technology, Stanford University and North Carolina State University. Sandia Laboratories, a subsidiary of Lockheed Martin company, is leading a team of industry partners on the project, including Micron Technology, Inc. and LexisNexis Special Services, Inc.

HORIUCHI, MOSS RECEIVE $1.5 MILLION NSF GRANT FOR 'COMPLEX SETTINGS' RESEARCH

Prof. **Timothy Horiuchi** is co-PI and Prof. **Cynthia Moss** is PI for a new National Science Foundation Collaborative Research in Computational Neuroscience grant, "Adaptive perceptual-motor feedback for the analysis of complex scenes." The five-year, $1.5 million grant will fund research to understand perception and action in complex settings, focusing on spatial perception and navigation in the echolocating bat.

Honors and Awards for ECE Faculty

MAYERGOYZ NAMED ALFORD L. WARD PROFESSOR, RECEIVES IEEE MAGNETICS SOCIETY ACHIEVEMENT AWARD

Prof. **Isaak Mayergoyz** was appointed as The Alford L. Ward Professor of Electrical and Computer Engineering (ECE) at the University of Maryland. Prof. Mayergoyz received the professorship in recognition of his sustained and influential work as a scholar and educator. He has been a full professor in the Department of Electrical and Computer Engineering at the University of Maryland since 1980. His research interests include plasmon resonances in metallic and semiconductor nanoparticles; spin polarized current induced nonlinear magnetization dynamics; analysis of fluctuations in semiconductor nanodevices; stochastic analysis of systems with hysteresis; drive independent recovery and forensics of hard disk data; computational electromagnetics; and power engineering.

ISAAK MAYERGOYZ

Prof. Mayergoyz was also selected to receive the Achievement Award of the Institute of Electrical and Electronics Engineers (IEEE) Magnetics Society. This is the highest award of the Magnetics Society and is given to an outstanding member each year to honor his or her lifelong professional achievement, and to recognize scientific, technical and service contributions to the society. The Magnetics Society Achievement Award is presented annually at the IEEE International Magnetics Conference (INTERMAG) and consists of a diploma with a citation and a cash prize.

CHELLAPPA RECEIVES AWARDS FROM IEEE SPS SOCIETY, PURDUE

Prof. **Rama Chellappa** received the highest award of the Institute of Electrical and Electronics Engineers (IEEE) Signal Processing Society (SPS), known as the Society Award. He was recognized for pioneering and fundamental contributions to image and video-based analysis and understanding.

Prof. Chellappa was also selected to receive the Outstanding Electrical and Computer Engineer (OECE) alumni award from Purdue University. The award was established in 1992 to recognize Purdue alumni who have demonstrated exemplary accomplishments, leadership and service to the community.

LIU RECEIVES IEEE SPS AWARD, INVITED TO NATIONAL ACADEMIES CONFERENCE

Prof. **K. J. Ray Liu** received the Institute of Electrical and Electronics Engineers (IEEE) Signal Processing Society (SPS) Technical Achievement Award for pioneering and outstanding contributions for the advances of signal processing in multimedia forensics, security, and wireless communications.

Prof. Liu was also selected to attend the 8th Annual National Academies Keck Futures Initiative (NAKFI) conference, "Seeing the Future with Imaging Science." NAKFI is a 15-year effort of the National Academy of Sciences (NAS), the National Academy of Engineering (NAE), and the Institute of Medicine to catalyze interdisciplinary inquiry and to enhance communication among researchers. The selection process for conference attendees is highly selective. "Seeing the Future with Imaging Science" explores the potential for Imaging Science research to have a major impact on global issues, including climate change, security, and medical advances.

WU RECEIVES IEEE EARLY CAREER TEACHING AWARD

Prof. Min Wu was selected as the winner of the IEEE Mac Van Valkenburg Early Career Teaching Award. The award recognizes members of the IEEE Education Society who have made outstanding contributions to teaching unusually early in their professional careers, as evidenced by teaching performance, development of new teaching methods, and curricular innovation. Prof. Wu was selected for her "outstanding contributions to undergraduate and graduate education in electrical and computer engineering, including innovative curricular development and influential mentoring."

BARAS RECOGNIZED FOR INNOVATION

Prof. **John Baras** was named among the 2009 Innovators of the Year by the Maryland Daily Record. Baras was recognized for his cryptographic key exchange system to improve digital video broadcasting.

Prof. Baras also received the Jimmy Lin Award for Innovation and Invention. He and his former student, Paul Yu, were awarded the prize for their invention, "Wireless Communication Method and System for Transmission Authentication at the Physical Layer." In 2008, Professor Emeritus **Hung C. "Jimmy" Lin** made a generous gift to establish the Lin Fund in order to promote the invention and patenting process among ECE faculty, staff, and students. Prof. Lin passed away in 2009. His wife, Anchen, presented the award to Prof. Baras at the ceremony.

SHAYMAN NAMED IEEE FELLOW

Prof. **Mark Shayman** was elected as a Fellow of the Institute of Electrical and Electronics Engineers (IEEE) in recognition of his contributions to the theory of Riccati equations and discrete-event dynamic systems.

DAGENAIS NAMED IEEE FELLOW

Prof. **Mario Dagenais** was elected as a Fellow of the Institute of Electrical and Electronics Engineers (IEEE) in recognition of his contributions to photon correlation, semiconductor devices, and integration technologies.

HERBERT RABIN RECEIVES UMD PRESIDENT'S MEDAL

Prof. **Herbert Rabin**, director of the Maryland Technology Enterprise Institute (Mtech), senior associate dean, and former interim dean of the Clark School, received the President's Medal from interim campus president Nariman Farvardin at the Faculty and Staff Convocation ceremony on October 12. The award is the highest bestowed by the university and recognizes a member of the College Park community who has made extraordinary contributions to the social, intellectual and cultural life of the campus.

MURPHY, GHODSSI PARTICIPATE IN NAE FRONTIERS OF ENGINEERING SYMPOSIA

Prof. **Reza Ghodssi** and Prof. **Thomas E. Murphy** were selected to participate in the National Academy of Engineering (NAE) Frontiers of Engineering Education (FOEE) symposium events.

Ghodssi took part in the inaugural European Union-U.S. Frontiers of Engineering Symposium, Sept. 1-3 in Cambridge, U.K. The symposium, which explored the areas of signal processing, bio-inspired engineering, augmented reality, and materials ecology, was organized by the NAE and the European Council of Applied Sciences and Engineering. Ghodssi was one of only 60 engineers invited to participate from EU and US industry, universities, and government labs.

Murphy was among only 53 of the nation's most innovative young engineering educators selected to take part in an NAE FOEE symposium to be held Dec. 13-16, 2010 in Irvine, Calif. The event will focus on innovative educational approaches in engineering.

Waks Receives Presidential Early Career (PECASE) Award

EDO WAKS

Prof. Edo Waks was awarded the Presidential Early Career Award for Scientists and Engineers (PECASE), the highest honor bestowed by the United States government on outstanding scientists and engineers in the early stages of their independent careers. Waks, who was nominated by the National Science Foundation (NSF), was one of 85 PECASE award recipients announced Nov. 5.

Waks was recognized for advancing the frontiers of knowledge in coherent interactions between photons and quantum dots using photonic crystals, and for engaging in education and outreach activities, including in local schools in Maryland.

Each year, 10 federal agencies join together to nominate scientists and engineers whose early accomplishments show the greatest promise for assuring America's preeminence in science and engineering and contributing to the awarding agencies' missions. Awardees are selected for their pursuit of innovative research at the frontiers of science and technology and their commitment to community service as demonstrated through scientific leadership, public education, or community outreach.

Prof. Waks previously received the NSF CAREER Award and the Office of Naval Research Young Investigator Award. His research interests include studying the application of photonic crystals to quantum information processing, as well as the use of photonic crystals for practical tools in optical telecommunication and sensing.

MURPHY HONORED FOR COMMUNICATIONS RESEARCH

Prof. **Thomas E. Murphy** received the inaugural Clark School Junior Faculty Outstanding Research Award. He was recognized for his use of nonlinear optical effects to achieve significant improvements in ultra-high-speed optical communications systems. He has established a strong record of competitive funding and high quality publications, is an active advisor of graduate students and serves as a member of a number of professional and campus organizations. A group of judges from the Clark School Board of Visitors chose Murphy from among several nominations.

MARTINS RECEIVES GEORGE CORCORAN AWARD

The George Corcoran Memorial Award for faculty was presented to Prof. **Nuno Martins**, who was recognized for showing exemplary contributions to teaching and educational leadership. Martins' long term goal is to establish a research program in the interface between control and information theory, with applications to decentralized and networked control, biological control systems, and applications of control to information theory.

Faculty Give Invited Talks, Distinguished Lectures

CHELLAPPA GIVES INVITED TALKS AT UC BERKELEY, FLORIDA

Prof. **Rama Chellappa** gave an invited talk on April 21, 2010 at the University of California, Berkeley as part of the Electrical Engineering and Computer Sciences Joint Colloquium Distinguished Lecture Series. His talk there, titled "Looking for Patterns in Videos," was supported by a McKay Visiting Professorship.

Prof. Chellappa also gave an invited talk on March 30, 2010 at the University of Florida as part of a distinguished lecture series sponsored by the Computer and Information Science and Engineering (CISE) Department. The title of the talk was "Looking for Patterns in Videos."

Most recently, Chellappa was invited to give the annual Spencer talk, hosted by the Department of Mathematics and Computer Science at the University of Missouri, St. Louis. The title of his talk was "Recent Advances in Face Recognition."

EPHREMIDES, LAROIA GIVE PLENARY TALKS AT CISS 2010

An ECE faculty member and an ECE alumnus were the two featured speakers at the Conference on Information Sciences and Systems (CISS), a prestigious conference now in its 44th year that is held in mid-March each year, alternating between Princeton University and Johns Hopkins University. CISS 2010 was took place on March 17-19, 2010 at Princeton University. Prof. **Anthony Ephremides** gave one of the two plenary talks. The title of his talk was "Simply Cooperative." In the talk, Prof. Ephremides described some new ways in which he and his students are approaching the very topical and current issue of cooperative wireless networking.

The other plenary talk was given by ECE alumnus **Rajiv Laroia** (M.S. '89, Ph.D. '92), Senior Vice President for Engineering at Qualcomm, a member of the ECE Advisory Board and the Clark School Board of Visitors, as well as an inductee of the Clark School Innovation Hall of Fame for his innovations in wireless communications technology. Dr. Laroia's talk, titled "Proximate Internet,"described a new type of peer-to-peer communication technology based on direct communication between physically proximate peers without the need of any infrastructure.

EPHREMIDES GIVES DISTINGUISHED LECTURES ON WIRELESS NETWORKING

Prof. **Anthony Ephremides** recently completed a series of four lectures as Distinguished Lecturer of the Institute of Electrical and Electronics Engineers (IEEE) Communications Society. During his Cooperative Wireless Networking lecture tour, he spoke at three universities in Australia and one university in New Zealand. Prof. Ephremides also gave a major plenary talk to the IEEE International Symposium on Information Theory (ISIT 2010) on June 16 in Austin, Texas. Ephremides spoke on "The Audacity of Throughput—A Trilogy of Rates." The talk reviewed an important aspect of cross-layer issues in communication networks with emphasis on wireless networks.

TONY EPHREMIDES

Most recently, Ephremides toured Sweden as a distinguished lecturer of the IEEE Communication Society and guest of four major universities of Sweden. He lectured on problems of integration between physical and upper layers in wireless networks in the areas of stable throughput, rate control, and delay. He was at the Royal Technical University (KTH) in Stockholm on Monday, Sept 27; the University of Linkoepping on Tuesday, Sept. 28; Lund University on Wednesday, Sept.

BARAS GIVES INVITED TALKS

Prof. **John S. Baras** recently participated in an invited presentation and discussion panel, organized and sponsored by MathWorks with the theme "Designing Better Control Systems with Computational Models." The panel was held on December 16, 2009 in Shanghai, China as part of the joint 48th IEEE Conference on Decision and Control (CDC) and of the 28th Chinese Control Conference (CCC).

JOHN BARAS

Baras also gave a distinguished lecture, "Trust and Reputation in Networked Systems: Social, Information, Communication, Control," at the University of California, Irvine. The lecture was part of the distinguished lecture series of the Networked Systems Program, a joint program between the Henry Samueli School of Engineering and the Donald Bren School of Information and Computer Sciences. He gave a distinguished lecture in June at United Arab Emirates University about his research in security and trust in communication, information and social networks.

Baras also gave an invited plenary presentation to the National Science Foundation's annual Engineering Research Center meeting on the history, current status and future of the Institute for Systems Research. Baras spoke at the "Sustaining the ERC after Graduation" workshop. He also gave an invited lecture at NSF about research challenges involving complex networks.

Finally, in July 2010, Baras gave the invited plenary lecture at the 9th International Federation of Automatic Control (IFAC) International Symposium on Dynamics and Control of Process Systems (DYCOPS 2010) in Leuven, Belgium, and gave an invited semi-plenary lecture at the 19th International Symposium on the Mathematical Theory of Networks and Systems in Budapest, Hungary.

LIU GIVES INVITED TALKS IN HONG KONG

Prof. **K. J. Ray Liu** delivered a plenary keynote at the IEEE International Conference on Image Processing (ICIP), the premier conference in image and video processing. The conference attracted over 1,500 attendees at its Hong Kong location this year. Prof. Liu's talk was titled "Multimedia Social Networking: A New Paradigm for Signal and Image Processing."


RAY LIU

He also gave an invited talk at The Chinese University of Hong Kong on September 22 as part of the Shun Hing Distinguished Lecture Series. His talk was titled "Reverse Engineering of Electronic Devices: An Information Forensic Paradigm."

DAVIS PARTICIPATES IN TAIWAN LECTURE TOUR

Prof. **Christopher Davis** recently participated in an invited lecture tour in Taiwan. He lectured at Academia Sinica on "The Optics of Surface Plasmon Polaritons: 'Cloaking' and 'Blackness,'" and at National Tsing-Hua University and National Taiwan Normal University on "The Optics of Surface Plasmon Polaritons: Fluorescence Enhancement and Cloaking." He also lectured at National Sun Yat-Sen University on the subject of "Directional Communication Networks" and was an invited speaker at a workshop on Nanoplasmonics and Metamaterials: Experiment and Theory, held at National Taiwan University, where he spoke on "Characterization of Enhanced Fluorescence from Quantum Dots on Nanostructured Surfaces."

VISHKIN GIVES INVITED TALK ON PARALLEL COMPUTING AT COLUMBIA

Prof. **Uzi Vishkin** gave an invited talk at Columbia University on Sept. 30. The talk, titled "Can a Simple Abstraction Guide the Reinvention of Computing for Parallelism?", was part of the Computer Science Department's Computer Architecture Lecture Series.

ORUC GIVES INVITED TALK AT CEWIT 2009

Prof. **Yavuz Oruc** gave an invited talk at the Center of Excellence in Wireless and Information Technology (CEWIT) Conference at SUNY Stony Brook in Marriott Islandia, NY. The title of Prof. Oruc's talk was "Quantum Packet Switching: A New Paradigm for Congestion-Free Packet Traffic."

ILIADIS GIVES IEEE DISTINGUISHED LECTURE ON NANOSENSORS

Prof. **Agis Iliadis** was invited to give an IEEE Distinguished Lecture on "Nanosensors for Critical Environments." This lecture took place on November 18th, 2010, and was supported by the Ohio Chapter IEEE EDS with Case Western Reserve University and NASA Glenn Research Center. The lecture featured discussion on the role of sensors in environmental, safety, and biomedical applications, and how the next generation requires higher responses and sensitivities. These new modifications will allow the sensors to be better applied in critical situations where early detection is necessary.

NEW APPOINTMENTS

JAJA NAMED INTERIM VP AND CIO OF UMD

Prof. **Joseph JaJa** was named Interim Vice President and Chief Information Officer of the University of Maryland in June 7 after the passing of Jeff Huskamp, who previously held this position. A distinguished researcher and administrator, JaJa is Professor of Electrical and Computer Engineering (ECE) with a permanent appointment in the University of Maryland Institute for Advanced Computer Studies (UMIACS). He served as the Director of UMIACS from 1994 through 2004.

SAFAR APPOINTED DIRECTOR OF MASTER'S IN TELECOM PROGRAM

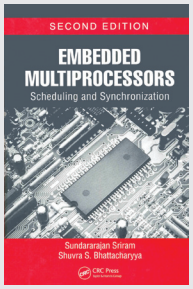
ECE Ph.D. alumnus **Zoltan Safar** was appointed as the Director of the Master's in Telecommunications Program at the University of Maryland, effective October 11, 2010. Safar most recently served as assistant professor in the Department of Innovation at the IT University of Copenhagen, Denmark.


ZOLTAN SAFAR

He received a University Diploma in electrical engineering from the Technical University of Budapest, Hungary in 1996, and his M.S. and Ph.D. degrees in electrical and computer engineering from the University of Maryland in 2001 and 2003, respectively. During his time at Maryland, he was advised by Prof. **K. J. Ray Liu**. His current research interests include wireless communications and multimedia signal processing, with particular focus on indoor and outdoor mobile positioning systems and algorithms.

NEW BOOKS BY FACULTY:

BHATTACHARYYA PUBLISHES NEW BOOKS ON EMBEDDED MULTIPROCESSORS, SIGNAL PROCESSING SYSTEMS

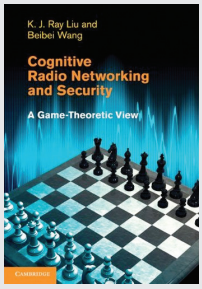


Prof. **Shuvra Bhattacharyya** is the co-author of "**Embedded Multiprocessors: Scheduling and Synchronization**," a second-edition book recently published by CRC Press. The book was co-authored by **Sundararajan Sriram** of Texas Instruments. The second edition explores modeling for multimedia systems and dataflow models for signal processing.

Prof. Bhattacharyya is also co-editor of a new book titled "**Handbook of Signal Processing Systems**." The handbook was published by Springer, and co-editors of the book include **E. F. Deprettere**, **Rainer Leuper**s, and **Jarmo Takala**. The handbook provides a comprehensive overview and reference for signal processing systems, and offers a primary point of entry for students in engineering, computer sciences, and system engineering into the field.

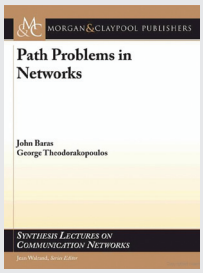
LIU CO-AUTHORS NEW BOOKS ON ARRAY PROCESSING AND SENSOR NETWORKS, COGNITIVE RADIO NETWORKING AND SECURITY

ECE Professor and Distinguished Scholar-Teacher **K. J. Ray Liu** is the co-author of two new books. The first, titled "**Handbook on Array Processing and Sensor Networks**," is published by Wiley, and provides readers with a collection of tutorial articles contributed by world-renowned experts on recent advancements and the state of the art in array processing and sensor networks. The book is co-authored by Prof. **Simon Haykin** of McMaster University in Hamilton, Ontario.



Prof. Liu also co-authored a new book titled "**Cognitive Radio Networking and Security: A Game-Theoretic View**" with alumna **Beibei Wang** (Ph.D., EE, '09), his former advisee who is now with Qualcomm. The book, published by Cambridge University Press, presents the fundamentals of designing, implementing, and deploying cognitive radio communication and networking systems. With the rapid growth of new wireless devices and applications over the past decade, the demand for wireless radio spectrum is increasing relentlessly. Cognitive radio networking provides a framework for making the best possible use of limited spectrum resources, and is currently revolutionizing the telecommunications industry. Uniquely, the book focuses on game theory and its applications to various aspects of cognitive networking.

BARAS PUBLISHES NEW BOOK ON PATH PROBLEMS IN NETWORKS



Professor **John S. Baras**, and alumnus **George Theodorakopoulos**, a senior researcher at the École Polytechnique Fédérale de Lausanne (EPFL), have published a new book titled "**Path Problems in Networks**." The book is part of Morgan & Claypool's Synthesis Lectures on Communication Networks, under the Editorship of Professor **Jean Walrand** of the University of California, Berkeley. The book provides a modern view on the algebraic path problem, and aims to help current and future researchers add this powerful tool to their arsenal.

PAPAMARCOU, WU AND MOORE HONORED AT COMMENCEMENT

WU, PAPAMARCOU, MOORE

Three ECE faculty and staff members were honored at the Clark School Commencement Ceremony on May 21, 2010. Prof. **Adrian Papamarcou** received the Pool & Kent Senior Faculty Teaching Award, given each year to a senior faculty member for excellence in teaching. Prof. **Min Wu** received the E. Robert Kent Junior Faculty Teaching Award, given each year to a junior faculty member for excellence in teaching. Executive Director of Operations **Teresa Moore** received the Clark School Staff Service Award for her outstanding work and leadership.

ECE FACULTY IN THE NEWS

LIU FEATURED IN *IEEE INSTITUTE* FOR INNOVATIVE CANCER RESEARCH

PROF. **K. J. RAY LIU** WAS FEATURED IN *THE INSTITUTE*, THE MONTHLY NEWSPAPER OF THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE), FOR HIS INNOVATIVE CANCER RESEARCH. THE FEATURE ARTICLE, WHICH SERVES AS THE COVER STORY OF THE PRINT EDITION OF THE IEEE INSTITUTE, DESCRIBES PROF. LIU'S USE OF DIGITAL SIGNAL PROCESSING TECHNIQUES TO EXTRACT DATA FROM DNA TO PREDICT AND DIAGNOSE CANCER DEVELOPMENT.

SMOLYANINOV RESEARCH FEATURED IN *MIT TECHNOLOGY REVIEW*

VISITING RESEARCH SCIENTIST **IGOR SMOLYANINOV** WAS FEATURED IN *MIT TECHNOLOGY REVIEW* FOR HIS USE OF METAMATERIALS TO MODEL THE BIRTH OF THE UNIVERSE.

SPECIAL FEATURE

Traveling Engineer: Riding the Shangahai Maglev Train

by Professor Emeritus Len Taylor

Are you out of your mind?' hissed my wife. "You are actually going to spend one hundred dollars more for a tour just because it will include a ten-minute train ride?"

"Well, yes!" I grinned.

I had learned that during our one-day layover in Shanghai, it would be possible to take a city tour that included a round-trip ride on the Shanghai Maglev train. I usually mention magnetic levitation and the maglev train in discussing applications of magnetic fields in my ENEE380 (Electromagnetic Theory) class, and this tour would allow me to enliven my lectures with some personal observations and photos.

Besides, although maglev train systems have been installed in several countries, they have generally been found to be cost-ineffective, unable to pay off the capital investment. There are no active plans to build other maglev lines and some have already been scrapped. When would I have another chance to ride a maglev? I missed out on the SST. (Who could afford it on my salary?) This might well be my last chance for the maglev.

The Shanghai Maglev runs 19 miles on a single elevated line from the outskirts of Shanghai to Pudong International Airport, and normally achieves a maximum speed of 268 mph (431 km/hr). A round-trip ticket costs only 80 yuan ($11.63), but ridership is only about 20% of capacity. The train, constructed in cooperation with Siemens and ThyssenKrupp, uses the German "Transrapid System."

Earnshaw's Theorem eliminates the possibility of stable levitation using static magnetic fields. In the Transrapid System, however, the magnetic fields are varied using electronic control of the magnets in the vehicle undercarriage to maintain the cars three-eighths of an inch above the roadway. Levitation is achieved using the attraction of the rails to magnets attached to the carriage, but located below the rails, using C-shaped supports. Other magnets mounted on the carriage provide lateral control. Forward propulsion (and braking) is provided by a long-stator linear motor; the linear stator windings are in the roadway alongside the carriage, and the exciting magnets are in the vehicle undercarriage. A traveling magnetic field drives the carriage forward.

AN ATTENDANT STANDS BY THE SHANGHAI MAGLEV TRAIN

Boarding, our twenty-odd group was led forward to the second of five cars. The first car was "elite class" and had wide leather seats. (The irony of "elite" seating in a "classless society" did not escape us.) The elite car was empty, and except for us, there were only a couple of dozen other passengers back in the last car. Our car, which seemed to be superior to theirs, was quite modern, clean, and comfortable. Surprisingly, the seats, which mostly faced forward, did not rotate, so that most of us had to sit going backwards on the return trip.

The train levitated imperceptibly and moved forward smoothly. We all watched as the large digital speedometer on the forward wall of the car. There was no shaking until the car reached 150 mph. Above that speed there was quite a bit of rattling, about as much as one experiences on AMTRAC at 80 mph. "Misaligned coils!" sniffed another tour group member, an unkempt professor of electrical engineering at NYU-Poly. A cheer went up as the speedometer reached 431 km/hr. The countryside, houses, and the highway and cars alongside flew by, creating the impression that one was in an aircraft about to land. The train eased to a stop at the airport terminus, and then, after a brief wait, returned us, exhilarated, to Shanghai.

The next day, our hotel's limo took us to the airport. The elevated express highway was alongside the maglev track, and en route we encountered the maglev train returning to Shanghai. I estimate that our closing speed was about 500 ft/sec. (For comparison, the speed of a .38 Special bullet is 630 ft/sec.) The maglev went by in a mere blink.

I gasped, "Wow!"

The limo driver laughed.

Len Taylor has been a faculty member at the University of Maryland since 1967 and has been a pioneer in the field of medical technology. He is now a Professor Emeritus but is still actively teaching in the department. He is the author of over 150 journal articles and conference papers, has had 48 funded research grants, contracts and projects, and holds six U.S. and 16 foreign patents. He is a life fellow of the IEEE and of the American Society for Laser Surgery and Medicine and has been a Distinguished Lecturer of the IEEE Engineering in Medicine and Biology Society.

ACCOMPLISHMENTS AND AWARDS FOR ECE ALUMNI

JEONG KIM INDUCTED INTO UMD ALUMNI HALL OF FAME

Clark School alumnus, benefactor and ECE professor of the practice **Jeong H. Kim** (Ph.D. '91, reliability engineering) was inducted into the University of Maryland Alumni Association's Hall of Fame. Kim was honored for his business acumen, innovations and entrepreneurship. Kim has been widely recognized for his achievements. In 2005, shortly after being appointed president of Lucent's Bell Labs unit, he was named one of the Top 10 Most Influential Asian Americans in Business. He has been inducted into the National Academy of Engineering and sits on a number of corporate, university and non-profit boards.

PATI INDUCTED INTO INNOVATION HALL OF FAME

Alumnus **Buno Pati** (B.S. '86, M.S. '88, Ph.D. '92, electrical engineering) was inducted into the Clark School's Innovation Hall of Fame for his innovations in phase-shift lithography, which have driven the development of smaller and smaller electronic devices with ever expanding applications. Pati's work has improved the capabilities of everything from computers to cell phones to GPS devices to MP3 players. Pati is a member of the Clark School Board of Visitors and the University of Maryland Board of Trustees.

BUNO PATI

ECE ALUMNUS SANIIE ELECTED IEEE FELLOW

The Institute of Electrical and Electronic Engineers (IEEE) recently elected ECE alumnus **Jafar Saniie** (B.S. '74), an electrical and computer engineering faculty member at Illinois Institute of Technology (IIT), to its class of 2010 Fellows for his contributions to ultrasonic signal processing for detection, estimation, and imaging. IEEE Fellowship is attained through nomination by peers and approval by the IEEE Board of Directors for distinction in the profession. Approximately 0.1% of the voting members of IEEE are elected by the Board of Directors every year to receive this honor, the highest membership grade in IEEE. IEEE is the world's leading professional association for the advancement of technology.

ALUMNUS ZHANG RECEIVES NSF CAREER AWARD, ONR YOUNG INVESTIGATOR GRANT

Alumnus **Fumin Zhang** (Ph.D., 2004) won a National Science Foundation CAREER Award for his research, "Feasibility of Control Tasks---Towards Control-Computing-Power Co-Design." The five-year, $400K grant will establish a theoretical foundation for battery-supported cyber-physical systems. He was also awarded a Young Investigator Program grant from the Office of Naval Research, one of only 17 awarded nationwide. an assistant professor of systems and controls in the School of Electrical and Computer Engineering at the Georgia Institute of Technology. He was advised by Professor **P.S. Krishnaprasad**.

ALUMNUS ZHU HAN RECEIVES NSF CAREER AWARD

ECE alumnus **Zhu Han** (Ph.D., '03), assistant professor of Electrical and Computer Engineering at the University of Houston, has won a National Science Foundation CAREER Award for his research, titled "Mutual Benefit in Cognitive Radio Networks: A Coalitional Game Framework." He was advised by Professor **K.J. Ray Liu**.

ALUMNA RAMIREZ RECEIVES LUMINARY AWARD AT HENAAC

ANA-LUISA RAMIREZ

Ana-Luisa Ramirez (B.S., '05, electrical engineering), was recently awarded the Luminary Award at the Hispanic Engineer National Achievement Awards Conference (HENAAC). HENAAC Luminary awardees are recognized them for their leadership, collaboration and initiative in programs and research within their respective organizations. Ramirez currently works with Northrop Grumman, a Clark School Corporate Partner and ECE Corporate Affiliate company, and serves as the the lead systems engineer for the Imagery Intelligence group for Northrop Grumman's Electronic Systems sector in Baltimore.

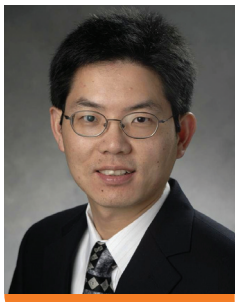
ALUMNUS HAMID JAFARKHANI NAMED 'CHANCELLOR'S PROFESSOR' AT UC IRVINE

Alumnus **Hamid Jafarkhani** (Ph.D., '97) was recently honored with the title "Chancellor's Professor" by the University of California, Irvine. The title is reserved for faculty members who have demonstrated unusual academic merit and whose continued promise for scholarly achievement is unusually high. At any given time, Chancellor's Professors compose a maximum of 3 percent of the faculty of the university. Jafarkhani has been on the faculty of UC Irvine's Department of Electrical Engineering and Computer Science since 2001. He is the deputy director of the Center for Pervasive Communications and Computing. At the University of Maryland, he was advised by University of Maryland Provost **Nariman Farvardin**.

NEW POSITIONS IN ACADEMIA, PROMOTIONS AND TENURE

ALUMNUS XIAOBO TAN EARNS TENURE, RECEIVES MSU TEACHER-SCHOLAR AWARD

Xiaobo Tan, a 2002 ECE Ph.D. graduate, was recently promoted to Associate Professor with tenure at Michigan State University (MSU). He has served at MSU as a faculty member in the Department of Electrical and Computer Engineering since 2004. During his time at the University of Maryland, Dr. Tan was advised by Prof. **John Baras** and Prof. **P.S. Krishnaprasad**. He also recently received the Teacher-Scholar Award at MSU. The university-wide award is given to faculty who have earned the respect of students and colleagues early in their careers for their devotion to teaching and scholarly promise. Tan was one of only six faculty at MSU to receive the award this year.



XIAOBO TAN

POOVENDRAN PROMOTED TO FULL PROFESSOR AT UNIV. OF WASHINGTON

Alumnus **Radha Poovendran** (Ph.D. '99, electrical engineering) was promoted to full professor by the University of Washington's Electrical Engineering Department. Prof. Poovendran research interests focus on communications, network security, and cryptography. Professor Poovendran is the Founding Director of the Network Security Lab (NSL). He is also a founding member and the Associate Director for Research at the University of Washington Center for Information Assurance and Cybersecurity. Prof. Poovendran has won several awards and honors, including a Presidential Early Career Award for Scientists and Engineers (PECASE) in 2005. During his time at the University of Maryland, Poovendran's Ph.D. advisor was Professor **John Baras**.

ALUMNUS NAMED VICE DEAN AT CAIRO UNIVERSITY

ECE alumnus **Amr A. Adly** (Ph.D., '92) has been appointed as Faculty of Engineering Vice Dean for Undergraduate Studies at Cairo University, Egypt. Dr. Adly has served at Cairo University as Professor in the Electrical Power & Machines Department, as well as Director for the Center for Advancement of Post Graduate Studies and Research in Engineering Sciences. He was advised by Professor **Isaak Mayergoyz** during his time at the University of Maryland.

ALUMNUS DU EARNS TENURE AT TEMPLE

Xiao-Jiang (James) Du, a 2003 ECE Ph.D. graduate, was recently promoted to Associate Professor with tenure at Temple University. He has served at Temple as a faculty member in the Department of Computer and Information Sciences since 2009. Prior to that, he served as Assistant Professor in the Department of Computer Science at North Dakota State University between July 2004 and August 2009, where he received the Excellence in Research Award from the College of Science and Math in May 2009. During his time at the University of Maryland, Dr. Du was advised by Prof. Mark Shayman. Prof. Du's research interests include network security, mobile and secure computing, and cloud computing. He has been awarded more than $1M in research grants from the National Science Foundation and Army Research Office.

ALUMNUS PENG QIU JOINS UNIVERSITY OF TEXAS FACULTY

ECE alumnus **Peng Qiu** has joined the Department of Bioinformatics and Computational Biology as Assistant Professor at the University of Texas M. D. Anderson Cancer Center in Houston, Texas. Dr. Qiu received his Ph. D. degree at the University of Maryland in 2007 and was advised by Prof. **K. J. Ray Liu**.

ALUMNA YAN SUN EARNS TENURE AT RHODE ISLAND

Yan Lindsay Sun, a 2004 ECE Ph.D. graduate, was recently promoted to Associate Professor with tenure at the University of Rhode Island. She has served there as Assistant Professor of Electrical, Computer, and Biomedical Engineering since 2006. During her time at the University of Maryland, Prof. Sun was advised by Prof. **K.J. Ray Liu**.

ALUMNUS ANDREI EARNS TENURE AT FSU/FAMU

ECE alumnus **Petru Andrei** (Ph.D., '04) was recently promoted with tenure to the position of Associate Professor of Electrical and Computer Engineering at Florida State University and Florida A&M University. Andrei was advised by Prof. **Isaak Mayergoyz**. He joined the FAMU & FSU College of Engineering in Fall 2004.

ALUMNUS EL SHERIF JOINS FACULTY AT ALEXANDRIA UNIVERSITY

ECE alumnus **Amr El Sherif** (Ph.D., '09) joined Alexandria University, Egypt, as an Assistant Professor. During his time at the University of Maryland, he was advised by Professor **K. J. Ray Liu**. His research interests include cooperative communications and networking, cognitive radios and dynamic spectrum sharing, and queuing theory.

AMR EL SHERIF

ALUMNUS APPOINTED AS ASSOCIATE DEAN FOR RESEARCH AND GRADUATE STUDIES AT GWU

ECE alumnus **Can Korman** has been appointed as Associate Dean for Research and Graduate Studies at George Washington University's School of Engineering and Applied Science. Dr. Korman, who joined the faculty at GWU in 1991, has previously served as Chairman of GWU's Electrical and Computer Engineering Department. Korman was advised by ECE Professor **Isaak Mayergoyz**, and earned all three of his advanced degrees at the University of Maryland — a B.S. in 1985, M.S. in 1987, and Ph.D. in 1990. Korman's research interests are in the areas of microelectronics, VLSI, magnetics, numerical modeling, and digital signal processing.

ALUMNUS IBRAHIM JOINS CAIRO UNIVERSITY FACULTY

ECE alumnus **Ahmed Ibrahim** has joined Cairo University, Egypt, as an Assistant Professor. Dr. Ibrahim, who was advised by Prof. **K.J. Ray Liu** earned his Ph.D. degree in Electrical Engineering from the University of Maryland in 2009. His research interests include cooperative communications and networking, cross-layer design of wireless networks, and MIMO-OFDM systems.

ALUMNA NAOMI LEONARD FEATURED IN *MECHANICAL ENGINEERING* MAGAZINE

Naomi Leonard (Ph.D.. '94), the Edwin Wilsey Professor of Mechanical and Aerospace Engineering at Princeton University, was recently featured in *Mechanical Engineering* magazine for her research on how to apply the rules underlying cooperative animal group behavior to control theory.. Leonard is looking for key principles in animal group behavior that can be used to design cooperative robots. Leonard gave a talk as part of the Booz Allen Hamilton Colloquium series at UMD on October 22, 2010.

ECE ALUMNI ADVANCE IN INDUSTRY

ALUMNUS ANTKOWIAK NAMED VP AT NORTHROP GRUMMAN

ECE Alumnus **Patrick M. Antkowiak** has been named vice president and general manager of the Advanced Concepts & Technologies Division for Northrop Grumman's Electronic Systems sector. In his new position, Antkowiak will have executive responsibility for all division programs and operations. He will be located at the company's Electronic Systems sector headquarters complex in Linthicum.

ALUMNI RETURN TO CAMPUS TO PARTICIPATE IN ECEGSA INDUSTRY PANEL

Four alumni participated in the Electrical and Computer Engineering Graduate Student Association (ECEGSA) Industry Roundtable discussion on Friday, April 16. The alumni guests shared viewpoints and perspectives, drawing from their experience in industry. The panelists included **Vikram Manikonda** (Ph.D., '97), President, Intelligent Automation; **Yun Zou** (Ph.D. '00), GE Research; **Yves Gnu** (Ph.D. '08), IBM Research; and **Shabnam Shafiee** (Ph.D. '08), Biomedical Engineer, Perinatronics Medical Systems.

IN MEMORIAM

Thomas M. Yeager (B.S., EE, '63) died April 3, 2010 at Anne Arundel Medical Center in Annapolis after suffering a stroke. He was 73 and lived in Fulton, Md. He earned a bachelor's degree in electrical engineering in 1963 from the University of Maryland, College Park, and a master's degree in 1969 in business administration from American University in Washington. He began his career working at Hewlett-Packard Co., and later served in public office, a veteran conservative Democrat who was a member of the Howard County Council for eight years, and later served three terms in the Maryland Senate. In 1982, he announced his candidacy for District 13, then a newly created legislative district, which encompassed Elkridge and parts of southern Howard and Prince George's counties. Mr. Yeager became the first state senator to represent the district, winning by a margin of 23 votes over Kay G. Bienen of Laurel, a two-term member of the House of Delegates. During his years in Annapolis, issues that concerned Mr. Yeager included criminal justice reform, victim's rights, child abuse, growth and taxes. He was a staunch fan of University of Maryland football and women's and men's lacrosse, and was a founding member of the Howard County University of Maryland Alumni Club. He is survived by his wife Olivia, daughter Laura, and two grandsons.

Robert V. Wertz (B.S., EE, '50) of Islip, NY, died suddenly on June 21, 2010. He was 84. He is survived by his wife, June Wertz and children Dave Wertz, Rick Wertz and Linda Hillman, as well as seven grandchildren.

Irving Etkind (B.S., EE, '39) was born on May 29, 1916 and passed away on January 5, 2010. He lived in Waltham, Massachusetts. He is survived by wife Lillian and children Alan and Stephen.

Galloway, Ropp Awarded L-3 Graduate Research Fellowships

ECE graduate students **Kevin Galloway** and **Chad Ropp** have been awarded L-3 Graduate Research Fellowships for the 2010-2011 academic year. Kevin and Chad are two of five Ph.D. students in the A. James Clark School of Engineering to receive the L-3 Graduate Fellowships this year. The other fellowship recipients were **Gregory Gremillion, Keith Gregorczyk,** and **Jessica Sheehan**.

KEVIN GALLOWAY (LEFT) AND CHAD ROPP

Kevin Galloway is advised by Prof. **P. S. Krishnaprasad**, while Chad Ropp, a 2007 B.S. graduate in electrical engineering at Maryland advised by Assistant Professor **Edo Waks**.

In July 2010, L-3 Communications gave a gift of $1 million over three years to the Clark School to benefit students through scholarships, fellowships and student program support. L-3 Graduate Research Fellowships annually support five Clark School Ph.D. candidates in the last three years of a Ph.D. program who conduct research in cybersecurity, robotics, energy, systems engineering, or reliability engineering.

George Zaki Selected as Texas Instruments Scholar

ECE Ph.D. student **George Zaki** has been selected as a Texas Instruments (TI) Scholar. He is an advisee of Professor **Shuvra Bhattacharyya**.

The TI Scholars program was made possible by a gift from Texas Instruments through the ECE Corporate Affiliates and Clark School Corporate Partners program. Each year, Texas Instruments supports talented graduate students in electrical and computer engineering with a tuition grant, stipend, and benefits through the TI Scholars program.

George will conduct research in Acoustics, Signal Processing, and Computer Engineering. His previous research focus has been on the efficient implementation of digital signal processing (DSP) systems, using dataflow models to analyze and implement DSP systems.

GEORGE ZAKI

Before coming to the University of Maryland, he was ranked at the top 1% of his class and was awarded a teaching assistantship at the American University in Cairo.

Hundreds Attend First Maryland Robotics Day

Over 400 visitors came to College Park to attend the first Maryland Robotics Day on Friday, September 10. Attendees included high school students, science teachers, and parents, as well as representatives from national laboratories and industry.

A total of 16 research laboratories on campus showcased their robotic projects. Graduate students and faculty advisors demonstrated their robotics work, and undergraduate students from the Science, Technology and Society honors program acted as guides throughout the event. The keynote speaker was Dr. **Martin Buehler**, Director of Research at iRobot.

The open house drew reporters from television, radio and print media, including Voice of America (VOA), WUSA-TV CBS Channel 9, Fox Channel 5, Science News, International Flight Magazine, Capitol News Service, and the Prince George's Sentinel, among others.

Electrical and Computer Engineering (ECE) Associate Chair for External Relations and Professor **Gil Blankenship**, ECE alumnus **John Karvounis**, and Engineer **Jay Renner** were featured prominently in the Channel 9 TV news coverage, which included footage of Prof. Blankenship's autonomous robots in action.

Robotics@Maryland Places 3rd in International AUVSI Underwater Vehicle Competition in San Diego

Robotics@Maryland placed third at the Association for Unmanned Vehicle Systems International (AUVSI) and Office of Naval Research (ONR) 13th Annual International Autonomous Underwater Vehicle Competition in San Diego, Calif., taking home $2,250 in prize money.

The Maryland student team competed against 21 other teams from across the globe, including Virginia Tech, University of Southern California, University of Florida, McGill University, North Carolina State University, U.S. Naval Academy, and Cornell University, whose team placed first in the competition.

The goal of this competition is to advance the development of autonomous underwater vehicles (AUVs) by challenging a new generation of engineers to perform realistic missions in an underwater environment. This event also serves to foster ties between young engineers and the organizations developing AUV technologies. Each team was asked to design and build an autonomous underwater vehicle capable of navigating realistic underwater missions. In 2008, the Robotics@Maryland team won the AUVSI competition in only its second year of participation.

THE ROBOTICS@MARYLAND TEAM PLACED 3RD AMONG 21 TEAMS

The Robotics@Maryland team comprised of students from various disciplines across campus, including Electrical and Computer Engineering, Mechanical Engineering, Physics, Mathematics, and Aerospace Engineering. The team was assisted by Prof. **Dave Akin** in the Space Systems Lab and Prof. **Nuno Martins**, who serves as faculty advisor, and traveled to San Diego to join the team at the competition. The team is sponsored by the National Science Foundation, the Departments of Electrical and Computer Engineering, Aerospace Engineering, and Computer Science, the Institute for Systems Research, the Clark School of Engineering, the Space Systems Lab, the Student Government Association, and the UM Office of the Vice President for Research, and also receives corporate support from Clark School Corporate Partners BAE Systems, Lockheed Martin, and Northrop Grumman, as well as SAIC, Apple, Hokuyo, The J. Craig Venter Institute, and MEMSense.

University of Maryland Hosts the Third Annual Autonomous Robot Speedway Competition

The University of Maryland hosted the third annual Autonomous Robot Speedway Competition (ARSC) on Saturday, Oct. 16 in the Jeong H. Kim Engineering Building Rotunda on the College Park campus. The event was sponsored by the Institute of Electrical and Electronic Engineers Robotics and Automation Society, the Institute of Electrical and Electronic Engineers Computational Intelligence Society, and the Institute of Electrical and Electronic Engineers Sensory Council and University of Maryland's Department of Electrical and Computer Engineering.

AUTONOMOUS ROBOT SPEEDWAY

This year's competition attracted 11 competing student teams, including teams from Johns Hopkins University, Prof. **Gil Blankenship**'s ENEE 408I Autonomous Robotics Capstone Design Course and the Robotics@Maryland student organization. UMD Team #5, consisting of undergraduate students **Usman A. Chaudhry, Nuttiiya Seekhao**, and **Nicole Yvette Word**, won first place and received a prize of $250. UMD Team #4 — **Abhishek Kumar, Denis Isael Morales**, and **Nicholas Sovich** — won second place and received a prize of $150, and UMD Team #1 won third place and received a prize of $100. The members of this team were **Yi Wei Lee, Xi Yang**, and **Mohammed Al Yaman**.

For more information about the event, please visit the Autonomous Robot Speedway website at: http://www.ece.umd.edu/arsc/.

RYU AND YOON AWARDED GRADUATE STUDENT SUMMER RESEARCH FELLOWSHIPS

Two ECE Ph.D. students, **Geunmin Ryu** and **Sung Jun Yoon**, were awarded Graduate Student Summer Research Fellowships for Summer 2010. The Summer Research Fellowships program, a companion program to the Flagship Fellowships and the Wylie Dissertation Fellowships that is now in its third year, enable doctoral students to devote a summer of focused work to prepare for or complete a benchmark in their program's requirements. The Fellowships carry a stipend of $5,000. Geunmin Ryu works in the Laboratory of Green Nanophotonics, Optoelectronics, and Nanosensing under the direction of Prof. **Mario Dagenais**. Sung Jun Yoon conducts research in the University of Maryland's Intense Laser Matter Interactions Group under the direction of Prof. **Howard Milchberg**.

ECE UNDERGRAD WINS SUSTAINABILITY VIDEO CONTEST

The winners of the 2010 Engineering Sustainability Workshop Video Contest were announced at the Clark School Sustainability Workshop on April 22. In the undergraduate category, ECE student **Adi Lang** won first prize of $300 for "Flush Smarter." The video can be seen on the Clark School website.

ECE GRAD STUDENTS HONORED AT DEPARTMENT RECEPTION

ECE graduate students were honored at the Department's annual Welcome Back Reception on September 7, 2010. ECE Chairman Dr. **Patrick O'Shea** was on hand to present awards. The George Corcoran Memorial Award for a graduate student, presented each year to a graduate teaching assistant in recognition of excellence in teaching, was awarded to two students this year: **Eduardo Arvelo** and **Mohammed Eslami**. The ECE Graduate Student Service Award was given to last year's ECE Graduate Student Association (ECEGSA) President **Satinder Pal Singh**, in recognition of exceptional service to the Department.

EDUARDO ARVELO

MITRA AND ZHENG AWARDED WYLIE FELLOWSHIPS

ECE graduate students **Vikramjit Mitra** and **Yufu Zhang** have been awarded 2010-2011 Ann G. Wylie Dissertation Fellowships. Vikramjit and Yufu were the only two Clark School students to receive this prestigious, university-wide fellowship. Vikramjit is advised by Prof. **Carol Espy-Wilson**, while Yufu is advised by Prof. **Ankur Srivastava**. The Wylie Fellowships include a $10,000 stipend and tuition remission for one semester.

RONG WINS BEST STUDENT PAPER AWARD AT WIOPT

Beiyu Rong recently won the Best Student Paper Award at the prestigious 8th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt) in June. The paper, "Stable Throughput, Rate Control, and Delay in Multi-Access Channels," represents an important step in linking information theoretic and networking concepts and points to new possibilities towards a stronger coupling between the two fields. Beiyu co-authored the paper with her Ph.D. advisor Prof. **Tony Ephremides**. Beiyu recently successfully defended her Ph.D. dissertation and is now participating as a postdoctoral fellow in a special joint program between the University of Texas at Austin and Texas A&M University.

KOTHA SELECTED AS ECEGSA PRESIDENT

APARNA KOTHA, A THIRD YEAR ECE PH.D. STUDENT, WAS NAMED THE NEW PRESIDENT OF THE ELECTRICAL AND COMPUTER ENGINEERING GRADUATE STUDENT ASSOCIATION (ECEGSA) FOR THE 2010-2011 ACADEMIC YEAR. APARNA IS ADVISED BY PROF. RAJEEV BARUA IN THE FIELD OF COMPUTER ARCHITECTURE AND HIGH PERFORMANCE COMPUTING. SHE RECEIVED HER UNDERGRADUATE DEGREE AT THE INDIAN INSTITUTE OF TECHNOLOGY, MADRAS IN ELECTRICAL ENGINEERING. SHE SERVED ON THE ECEGSA BOARD AND THE WOMEN IN ECE (WECE) BOARD. SHE HAS ALSO BEEN A DEPARTMENT REPRESENTATIVE FOR ECE IN THE GRADUATE STUDENT GOVERNMENT. SHE WAS A TEACHING ASSISTANT FOR THE ECE DEPARTMENT DURING SPRING AND FALL 2008. APARNA WAS AWARDED THE DISTINGUISHED TEACHING ASSISTANT AWARD BY THE DEPARTMENT FOR 2008-2009 AND LOOKS FORWARD TO MORE TEACHING EXPERIENCE IN THE FUTURE.

MERIT-BIEN POSTER WINS TWO AWARDS AT NSF MEETING

A poster created by students participating in the Maryland Engineering Research Internship Teams (MERIT) Biosystems Internships for Engineers (BIEN) undergraduate summer research program earned two awards at a recent meeting for the National Science Foundation (NSF) Computer, Information Science & Engineering (CISE) Research Experiences for Undergraduates (REU) program. The poster, titled "Robust Speech Recognition," was created by undergraduate researchers **Rob Bailey** and **Wody Edji**, who were mentored by **Carol Espy-Wilson** and her graduate student advisee **Vikram Mitra**. The poster received the awards for most interesting project and most technically challenging project.