



# CONNECTIONS

ELECTRICAL AND COMPUTER ENGINEERING

A newsletter of the  
Department of Electrical  
and Computer Engineering

## INSIDE

- 2 Kim Building dedication
- 2 Nano program earns top ranking, national attention
- 4 Feature interview with new chair Patrick O'Shea
- 5 ECE faculty win Invention of the Year
- 6 Alumni honors: Jeong Kim & Phil Wisner
- 6 Alumni news
- 8 Faculty news
- 10 Student news
- 12 Profile: graduate student Kevin Galloway

## Professor and Alumnus Patrick O'Shea Named New Chair of ECE Department

Professor **Patrick O'Shea** was named the new Chair of the Electrical & Computer Engineering (ECE) department at the University of Maryland.

"I am particularly pleased with this appointment," said **Nariman Farvardin**, professor and dean of Maryland's A. James Clark School of Engineering. "[Dr. O'Shea] brings to this position a wealth of administrative experience, a high level of energy and the necessary aspiration to move the department to a higher level of excellence and national distinction."

An alumnus of the University of Maryland, O'Shea served for four years as Director of the Institute for Research in Electronics and Applied Physics (IREAP) at Maryland. O'Shea has been a faculty member of Maryland's ECE department for six years. He is a Fellow of the American Physical Society, and a Fellow of the Institute of Electrical and Electronic Engineers.

O'Shea was born in Cork, Ireland, where he received his secondary education at Coláiste Chríost Rí, and his B.Sc. degree in physics from University College Cork. After gaining his M.S. ('82) and Ph.D. ('86) in physics from the University of Maryland, he conducted his early research at the University of California, Los Alamos National Laboratory, where he worked on the Beam Experiment Aboard Rocket Project and the APEX Free-Electron Laser Project. Later, he continued his research at Duke University.

O'Shea's current research is in the area



ECE Chair Patrick O'Shea

of charged particle beam technology. During his tenure as Director of IREAP, he played a major role in the establishment of the Maryland Center for Integrated Nano Science and Engineering.

O'Shea received the unanimous

endorsement of the search committee and the overwhelming support of the faculty, staff and students. He succeeds Professor **Steve Marcus**, who served as ECE Chair for the last five years.

"I congratulate Pat on his appointment and am confident that he will be very successful and productive in this position," said Marcus. "He knows the Department well and has shown leadership as a faculty member."

During Dr. Marcus' tenure as chair, the department increased faculty research funding and expenditures, raised the quality of its undergraduate and graduate student populations, hired a significant number of outstanding new faculty, and earned increasing recognition for its academic excellence through faculty awards and national publications. Dr. O'Shea hopes to continue that momentum as department chair. ☐

See inside, p. 4: Interview with Dr. O'Shea



## Welcome to the Future: Kim Building Dedication Draws Industry, Government Officials

On September 19, 2005, the Clark School dedicated the new cross-disciplinary Jeong H. Kim Engineering Building. Dedication activities included the induction of two new members into the Innovation Hall of Fame at its new location in the north wing of the Kim Building, and the Charles and Helen White Symposium on engineering innovation, which took place in the Kim Building lecture hall.

Government and University officials were on hand to participate in the dedication ceremony, including Maryland Governor **Robert Ehrlich**; **Michael Busch**, speaker of the Maryland House of Delegates; **William “Brit” Kirwan**, chancellor of the University System of Maryland; **C.D. Mote, Jr.**, president of the University of Maryland; Clark School Dean **Nariman Farvardin**; and **Jeong H. Kim**, Clark School alumnus, ECE professor of practice and benefactor, and head of Bell Labs.



Jeong H. Kim (left) & Dean Nariman Farvardin

The Kim Building marks a new milestone in the quality of research and education facilities available to students and faculty. The building’s state-of-the-art labs are shared across departments to encourage cross-disciplinary work. The building’s facilities and layout encourage both major conferences and small, impromptu discussions where new ideas are exchanged, and the spacious design and communications systems foster a spirit of openness. The Kim Building’s transparent construction components serve as a working laboratory.

To learn more about the new Jeong H. Kim Building and see more photos, visit the ECE website: [www.ece.umd.edu](http://www.ece.umd.edu).

## Maryland’s Nanotechnology Program Earns #1 Ranking, National Attention

Since the new Maryland Center for Integrated Nano Science and Engineering (M-CINSE) opened its doors in the Kim Engineering Building, Maryland’s nanotechnology program has gained increasing national attention. In its May/June 2005 issue, *Small Times* magazine ranked the University of Maryland’s nanotechnology research and education initiatives first in the nation.

Universities were evaluated based on research, educational opportunities, resources, commercialization, industry outreach, and peer assessments. In the quantitative analysis, *Small Times* cited the new Jeong H. Kim Building, M-CINSE, nearly 100 faculty, 120 published papers in 2004, and more than 400 grants for the nano research ranking, and five undergraduate and six graduate level nanotechnology courses for the nano education ranking.

Maryland’s nanotechnology program was also highlighted in a July 7, 2005 article in the *Washington Post*.

## Honors & Awards for ECE Faculty

### Gligor Receives National Information Systems Security Award

Professor **Virgil Gligor**, one of the country’s pioneering figures in computer security, is the winner of the 2006 National Information Systems Security Award. The award, generally considered to be the most prestigious in the field of information security, will be presented by the National Security Agency (NSA) and National Institute of Standards and Technology (NIST) in a ceremony at the 26th Annual Computer Security Applications Conference in Tucson, Arizona on December 6, 2005.

The National Information Systems Security Award recognizes individuals for scientific or technological breakthroughs, outstanding leadership, highly distinguished authorship, or significant long-term research related to computer security solutions. Gligor will receive the award for his outstanding contributions to advance computer security technology.

Gligor, who has been with the University of Maryland since 1976, has been a leader in computer security research and education for 30 years in a broad range of areas, including access control mechanisms, penetration analysis, denial-of-service protection, cryptographic protocols, and applied cryptography.

### Milchberg Wins the APS Excellence in Plasma Physics Award

Professor **Howard Milchberg** received the American Physical Society’s (APS) 2005 Excellence in Plasma Physics Award. Milchberg received the award “for the conception and first realization of hydrodynamic shock-formed plasma channels, and for the development of diagnostics for

their characterization.” The Excellence in Plasma Physics Award was established by the APS in 1981 and is presented each year at the organization’s annual meeting.

### Armand Makowski Named IEEE Fellow

ECE Professor **Armand Makowski** has been named a Fellow of the Institute of Electrical and Electronics Engineers, Inc. (IEEE). In electing



Armand Makowski

him to this highest level of IEEE membership, the IEEE Board of Directors cited Makowski for his contributions to traffic modeling and performance evaluation in communication and computer networks. Election to IEEE Fellow honors engineering professionals with extraordinary records of accomplishment. Each year, following a rigorous evaluation procedure, the IEEE Fellow Committee recommends a select group of recipients for election to IEEE Fellow.

### Liu Honored with Clark School’s Poole and Kent Senior Faculty Teaching Award

Professor **K.J. Ray Liu** received the Clark School’s 2005 Poole and Kent Senior Faculty Teaching Award. Liu won the award for the impact he has made on the College’s education and curriculum. The award was presented to Liu at the 2005 Commencement ceremony on May 22.

### Min Wu Wins ONR Young Investigator Award, Selected to Join Young Engineers for NAE Frontiers Symposium

Assistant Professor **Min Wu** was selected as an Office of Naval Research (ONR) Young Investigator. The three-year, \$300,000 award will support her research in “Digital Fingerprinting for Multimedia Security and Forensics.” Wu was one of

only 28 investigators selected nationwide, and one of only two from its Mathematical Computer and Information Sciences Division. Competition for the award is fierce; ONR estimates that only 10 percent of the proposals submitted result in an award.

Wu was also among 88 of the nation’s brightest young engineers chosen by the National Academy of Engineering (NAE) to participate in the 11th annual Frontiers of Engineering symposium on Sept. 22–24, 2005, at the GE Global Research Center in Niskayuna, N.Y. Participants were nominated by fellow engineers or organizations, and chosen from 220 applicants.

### Ott Wins Clark School Outstanding Faculty Research Award

ECE Professor **Edward Ott** was awarded the Clark School Outstanding Faculty Research Award in recognition of his advancements in estimating the current state of the atmosphere and for his many contributions in developing the broad area of chaos and nonlinear dynamics.



Edward Ott

The award includes a cash award of \$2,000, and a research augmentation award worth \$5,000 per year for three years. Last year’s Outstanding Faculty Research Award winner was Professor Thomas Antonsen, who was Ott’s Ph.D. student when they were both at Cornell University.

### Bhattacharyya Selected for Fulbright Grant

Associate Professor **Shuvra Bhattacharyya** was selected for a Fulbright Senior Specialists Grant in Information Technology at the University of Erlangen-Nuremberg, Germany. The grant will provide support for Bhattacharyya to teach a

course on hardware and software design methodology for digital signal processing systems at the University of Erlangen-Nuremberg this December.

### Espy-Wilson Named Fellow of the Acoustical Society of America

Associate Professor **Carol Espy-Wilson** has been named a Fellow of the Acoustical Society of America “for contributions to speech communication and mentoring.” She will receive her fellowship certificate in June 2006 at the 151st ASA Meeting in Providence, R.I.



Carol Espy-Wilson

### Chellappa Appointed as Minta Martin Professor of Engineering

Professor **Rama Chellappa** was appointed Minta Martin Professor of the A. James Clark School of Engineering by Dean **Nariman Farvardin**. This is a five-year appointment in recognition of Dr. Chellappa’s distinguished contributions to the Clark School. In addition to the title, faculty appointees receive discretionary funds in support of their research and education endeavors.

### Murphy Receives Corcoran Award at ECE Department Awards Ceremony

Assistant Professor **Thomas Murphy** received the Department’s George Corcoran Memorial Award, presented annually to a young faculty member who has shown exemplary contributions to teaching & educational leadership.

At the same ceremony, **Vivian Lu** was given the ECE Staff Award for her outstanding service to the Department, and Graduate Teaching Assistants **Quoc Lai** and **Alfred Haas** were presented with the Corcoran Award for Students in recognition of their excellence in teaching. 🏆

# Connecting the Department's Past with its Future: An Interview with New ECE Chair Dr. Patrick O'Shea

*Q: You are not only a professor and Chair here at Maryland, but also an alumnus. How does your status as an alumnus affect the way you approach your job as Chair?*

Well, it gives me an interesting historical perspective. First of all, having come from a foreign country [Ireland] gives me a bit of an outsider's view. Also, having been here as a student for five years, then leaving for over a decade, and coming back later has allowed me to have a broad perspective that would be quite different if I'd grown up here or been here all the time.

There's been a huge transformation in the University over the past twenty years. There is much more care and attention to how things are done. The quality of everything has changed enormously. We've created a better learning and research environment.

*Q: After graduating from Maryland, you conducted research at Los Alamos Laboratory. What did you learn from those early experiences?*

Well, it was great to have the opportunity to leave. I could have stayed here after I graduated from Maryland, but I decided that I needed to get a broad experience and exposure to new things. So going to Los Alamos appealed to me, not only because it was a nice physical environment, but also because it gave me an opportunity to play in the "big leagues" on large, well-funded projects. I like to work in a team environment, and this was an absolutely great opportunity.

I found myself getting propelled pretty quickly into leadership positions at Los Alamos, even though I felt I lacked a lot of the technical experience necessary. The project I worked on initially was to launch a particle accelerator into space, but fortunately, nobody had done that before, so I guess my ignorance wasn't as bad as

it might have appeared. Basically, I had applied a lot of what I learned here as a student in a simple laboratory setting, and then took it into a whole new space environment.

Los Alamos represented a completely different way of doing business than a uni-



Patrick O'Shea in front of the new Kim Building

versity, and much closer to what industry does. It was useful to get a different perspective on organizational structure and the importance of team thinking. Often times, as professors, we tend to act as isolated islands with our research, whereas in industry and national labs, people have to work in very large teams. And so it's useful to understand how that works—it's a completely different dynamic. The University in many respects is moving away from the individual, isolated professor model, toward more team-oriented, large projects, large centers, large institutes that are going after large programs.

My experience at Los Alamos has been useful and translatable into the modernized, third-generation University of

Maryland. Generation one was education, pure and simple. Generation two, beginning after World War II, was research and education. In generation three, we are an engine for economic development. We are still ramping up to this level, where we really have a strong influence on what happens in the state and the greater Washington region, in terms of driving innovation and converting that into business opportunities. That is still something we're relatively young at and we are still learning. Interacting with business is a very complicated thing, and also involves interacting with government on a state and local level.

*Q: Before becoming Chair of the ECE Department, you served for four years as Director of Maryland's Institute for Research in Electronics and Applied Physics (IREAP). How did your time there help prepare you to lead the ECE Department?*

That helped me enormously with understanding the "nitty-gritty" of how a university works. I've seen other departments where faculty members are plucked right out of the faculty and become the department chair. And that's actually a scary prospect, because departments are extremely complicated things, in terms of regulations, finances, students, staff, faculty, everything.

Working at an institute allows you to experience a lot of those things, but in a reasonable sized chunk. You get experience with a lot of how the University works—the finances, and this and that—but don't have to deal with a lot of the other complexities of having a very large faculty and a large number of students. ECE is three times the size of IREAP, and there is a much greater degree of complexity. Having been Director at IREAP means

that I have a very good understanding of how the University works from an administrative point of view. And so I don't have to learn all these things just from scratch.

*Q: There is some very exciting research taking place right now here at Maryland and in our Department. Can you name current projects that might particularly interest alumni with regard to their application to today's global challenges and needs for technological advancement?*

Well, I think many of the interesting projects relate to interactions across disciplinary boundaries. The days of the department just acting in isolation are long gone. Consider nanotechnology, a new initiative that I have played a role in. Nanotechnology has broad implications that are very interesting. It's bringing in ECE, physics, mechanical engineering, chemistry, chemical engineering, and so forth. That's a paradigm for the new frontiers of research, integrating biology, physical science, and engineering to develop new practical products.

If we think about nanotechnology, it's not just simply a smaller version of microtechnology, which has brought us a lot of great things we have today. Nano represents a paradigm for a new way of looking at materials, because it turns out that when you look at these materials on a very small scale, their behavior is quite different.

So we have to rethink how we can make these new properties of materials useful to us, in terms of electronics, bulk properties of materials, surface finishes on materials, and so forth. It impacts all aspects of practical products. There are nano particles in cosmetics, bicycles, and clothing. These are trivial examples, but there will also be advances in computing that are driven by nanoelectronics. If you look at computer engineering at one end and electrical engineering at the other end of the Department, they're going to have to evolve in a whole new direction because the kind of computers we

have today don't scale well to ten years from now, both from the hardware and software point of view. So the new, exciting areas are going to span all across the Department, because we're going to have new materials to work with and physical principles to apply.

*Q: One of your primary interests as Chair has been reconnecting with our Department's past. Do you think that our Department's history is important in addressing our present day*



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**“Our primary mission is to educate students. . . We should not lose sight of the fundamental reason we're here.”**

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*identity, as well as our future?*

Absolutely. I think if you just exist in the present, you don't know where you're going because you don't know where you've been. It's important to understand history and traditions because they give people an anchor and a sense of belonging. If there is no sense of belonging, people will not see any benefit to group action. They will just act as independent actors and be uncooperative.

It's like family, you like to be connected with your family and know where you came from and where your parents came from. It gives you a feeling of belonging in a great sea of confusion. Without this, you would have no anchor. In order to make

progress in the future, you need to have a stable past.

So that's why I have this interest in recovering our connection to the past before we lose it altogether. And that's why if you look around my office, you see that it's decorated with ancient slide rules, a 250-year-old encyclopedia, and things like this, which show the connections with fundamental numbers and calculations and where our knowledge has come from.

*Q: What advancements and improvements do you hope to see in our Department during your time as Chair?*

Our primary mission is to educate students. I think we need to put a great effort into enhancing the quality of our educational program. A lot of focus in the past several decades has been on the enhancement of our research program. We started as an educational institution, we then moved into research, and I mentioned entrepreneurialism, but we should not lose sight of the fundamental reason we're here—the reason we exist is to train students and train the workforce for the state of Maryland. We need to put more resources into the quality of the practical education and the quality of the labs we have here. I think it is fundamentally important, but it will take a lot of money, a lot of resources.

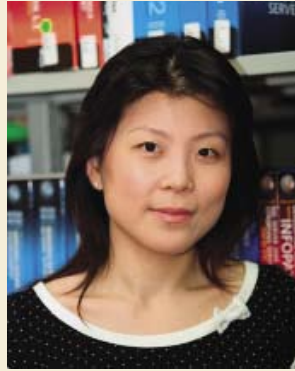
*Q: Do you have anything else you would like to share with alumni and friends of the Department?*

I think we're now a great place, and we're getting even better. When I was a student here, it's as if we were a somewhat disorganized, hungry rabble at the gates of the great castle. In the last 20 years, we've climbed over the ramparts, and gained respect. We have achieved a tremendous amount. Now we're a wonderful place for the children of our alumni and friends to come and study. We need to make sure we do not lose the hunger that spurred us to get where we are today. ☺

## ECE Alumna Haitao Zheng Named to MIT's TR 35, Joins Computer Science Faculty at UC-Santa Barbara

ECE alumnus **Haitao Zheng** has been named one of the top 35 innovators under the age of 35 by the Massachusetts Institute of Technology's *Technology Review* magazine.

The magazine cited Zheng for her "youth and... brilliance," noting her work on cognitive radios, which dynamically detect unused radio frequencies, helping alleviate competition in the radio spectrum. Zheng will continue her research on open spectrum systems this fall in her new position as an assistant professor of computer science at the University of California, Santa Barbara.



Haitao Zheng

Zheng earned a Ph.D. in Electrical and Computer Engineering at the University of Maryland in 1999, and was nominated for the TR 35 by her former advisor, Dr. **K.J. Ray Liu**. As a student at Maryland, she received an Outstanding Grad Student Award from the Institute of Systems Research (ISR), and the Bell Labs President Gold Medal for her work in the Wireless Communications Research Lab. She was later recruited to Microsoft

Research in China.

The TR 35 list includes inventors, discoverers, and entrepreneurs engaged in emerging technology, recognizing individuals in both academia and industry whose "achievements will shape the world we live in for decades to come." *Technology Review* began the TR list six years ago to recognize the world's top innovators under 35 years of age. The list, which formerly cited the top 100 innovators, was reduced to 35 this year. Inclusion among the TR list has become one of the most prestigious awards for young innovators around the world.

For more information, visit: <http://www.technologyreview.com/>.

## Phil Wiser and Jeong H. Kim Win Alumni Honors

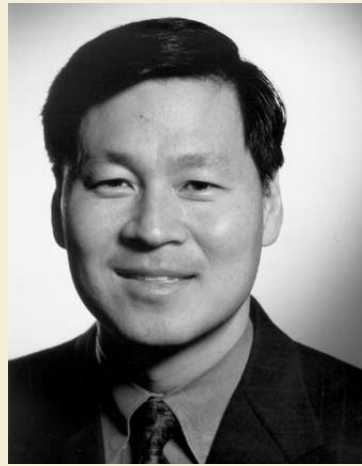
Dr. **Jeong H. Kim**, Clark School alumnus, ECE professor of practice, and the man for whom the Kim Engineering Building is named, received the President's Distinguished Alumnus Award from the UM Alumni Association in December.



Phil Wiser

was presented with the Clark School's Distinguished Alumnus of the Year award at the same ceremony.

The Distinguished Alumnus of the Year award recognizes recipients with pro-



Jeong H. Kim

**Michael Griffin**, '77.

Dr. Kim, Ph.D. '91 in reliability engineering, recently was appointed head of Lucent's Bell Labs. The Jeong H. Kim Engineering Building was completed earlier this year and was dedicated September 19.

Mr. Wiser, B.S.

Each year, the President's Distinguished Alumnus Award goes to an alumna/us who has achieved national recognition for excellence in his/her profession or field. Past Clark School winners of this award include **Gordon England**, '61, and **A. James Clark**, '50.

Another ECE alumnus, **Phil Wiser**,

professional achievements and demonstrated success; contributions to and impact on his/her field of engineering; recognition and honors received; service and contribution to the University; and various personal aspects, such as obstacles overcome, and community involvement.

Past winners of this award include

'90 in electrical engineering, is vice president and CTO of Sony Corporation of America.

The Alumni Association Awards Gala took place December 3, 2005, at the Riggs Alumni Center. For more information about the event, visit the ECE website at: [www.ece.umd.edu](http://www.ece.umd.edu).

# Hinman, '82, Is Ernst & Young Entrepreneur of the Year

ECE alumnus, benefactor, and educational innovator **Brian Hinman**, '82, was named Entrepreneur of the Year in Communications and Networking by Ernst & Young.

The award recognizes outstanding entrepreneurs who are building and leading dynamic and growing businesses—and Hinman's successes as a business builder and leader are legendary. He is most recently co-founder, president and CEO of 2Wire, a provider of broadband service platforms exclusively for the DSL market.

Hinman also was co-founder and CEO of Polycom, Inc., the world's leading teleconferencing company. Prior to

Polycom, he co-founded PictureTel Corporation at the age of 22. For his technological advances at these two companies, he was inducted into the Clark School's Innovation Hall of Fame in 2000.

In receiving the award, Hinman competed against 25 finalists from California. He will be eligible for consideration in the national program, which will announce its winners next month.

In addition to achieving his own suc-



Brian Hinman

cesses in entrepreneurship, Hinman has made it more likely that others will follow his lead. The Hinman Campus Entrepreneurship Opportunities (CEOs) program was established here in 1999 thanks to a \$2.5 million donation from Hinman. The Hinman CEOs is a unique living-learning program offered to undergraduate students interested in entrepreneurial ventures and is jointly run by the Clark School of Engineering and the R. H. Smith School of Business. ☐

## ECE Alumni Achievements & Recognition

ECE alumnus **Koushik Kar** has been awarded a Faculty Early Career Development Award (CAREER) from the National Science Foundation (NSF).

The NSF CAREER Award recognizes talented young faculty at the beginning of their careers, and is one of NSF's most competitive and prestigious awards.

Kar currently serves as assistant professor of electrical, computer, and systems engineering at Rensselaer Polytechnic Institute. The five-year, \$409,939 grant will allow Kar to continue his research aimed at improving the flow of information through large-scale wireless sensor networks.

Kar earned both an M.S. in electrical engineering in 1999 and Ph.D. in electrical and computer engineering in 2002 at the University of Maryland. He went on to join the Rensselaer faculty in 2002.



Koushik Kar

**David Bader**, a 1996 Ph.D. graduate advised by ECE professor **Joseph Jaja**, joined the faculty of Georgia Tech's School of Electrical and Computer Engineering this fall.

**Sean Andersson**, a 2004 Ph.D. graduate and former student of **P. S. Krishnaprasad**, has accepted a position as Assistant Professor in the Department of Aerospace and Mechanical Engineering at Boston University, beginning with the Spring 2006 semester.

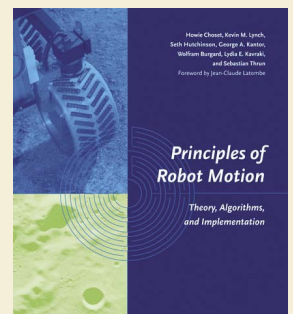
**Namrata Vaswani**, a 2004 Ph.D. graduate advised by **Rama Chellappa**, has accepted a position as assistant professor in the Electrical and Computer Engineering department at Iowa State University.

ECE undergraduate alumnus **Allen Todd** was named vice president for BPL (Broadband Over Powerlines) Operations for Communication Technologies, Inc. (COMTek), the nation's leader in commercial deployment of BPL technology.

**Hesham El-Gamal**, Ph.D. '99, an associate professor at Ohio State University's Electrical and Computer Engineering department, returned to College Park October 28 to take part in "Careers in Academia," a Clark School information session designed to coach students interested in becoming faculty after graduating. El-Gamal was one of two alumni to participate in the session.

**George Kantor**, a 1999 Ph.D.

graduate advised by **P. S. Krishnaprasad**, is co-author of a new book, *Principles of Robot Motion: Theory, Algorithms and Implementation*, published by MIT Press, 2005. Kantor is a project scientist in the Field Robotics Center at Carnegie Mellon University's Robotics Institute. ☐



George Kantor's book, Principles of Robot Motion


## ECE Faculty Win Invention of the Year Awards in Two Categories

ECE faculty won in two categories and two other ECE-related inventions were runner-up finalists at the University of Maryland's 18th annual Invention of the Year awards, sponsored by the Office of Technology Commercialization.

In the Information Science category, Professor **K.J. Ray Liu**, along with Dr. **Weifeng Su** and Dr. **Zoltan Safar**, won for their invention, "Coding Techniques for Maximum Achievable Diversity in Space, Time and Frequency for Broadband Wireless Communications." Dr. Liu's team developed a systematic code design method that can guarantee reliable data transmissions at high data rates in broadband wireless communications using multiple transmit antennas.

In the same category, Assistant Professor **Rajeev Barua** & ECE graduate student **Sumesh Udayakumaran** were finalists for "A Dynamic Memory Allocator for Embedded Systems with Scratch-Pad Memory."

In the Physical Science category, Assistant Professor **Pamela Abshire**, Dr. **Benjamin Shapiro**, and Associate Professor **Elisabeth Smela** won for their invention, "Cell Sensor Based Pathogen Detection." The invention, which sought to create a "cell canary" pathogen detection system that monitors the response of many live cells to the external environment, also earned a National Science Foundation award.

In the same category, Associate Professor **Reza Ghodssi** and ECE grad student **Brian Morgan** were finalists for their work related to "On-Chip Active Optical Fiber Alignment System using Gray-Scale Technology." 

### Team Led by Joseph Jaja Receives Grant from NSF & Library of Congress for Digital Preservation Research

A research team led by Dr. **Joseph Jaja** has received a grant from the National Science Foundation and Library of Congress to fund digital preservation research. The group's new management architecture will create a secure archive that provides producers, site administrators, and preservation managers key functionalities for the long-term access and preservation of digital assets. Dr. Jaja's research team was one of eleven university teams researching digital preservation to receive an award. Jaja's team was awarded \$490,157, one of the largest grants awarded to any of the university groups.

### Liu Delivers Keynote at IEEE International Workshop on Multimedia Signal Processing

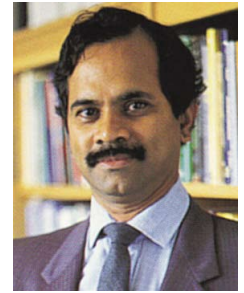
Professor **K.J. Ray Liu** delivered a keynote address on multimedia forensics at the IEEE International Workshop on Multimedia Signal Processing (MMSP) on November 2, 2005, in Shanghai, China. Liu's talk, titled "Multimedia Forensics for Traitors Tracing," offered a broad overview of the recent advances in multimedia fingerprinting for traitor tracing. Liu discussed optimal strategies to resist attempts to remove digital fingerprints called "collusion attacks," identify the colluders, and corroborate their guilt.

### Ephremides Delivers Keynote on Wireless Sensor Research

Professor **Tony Ephremides** gave the keynote address on "Making Sense out of Sensor Networks" at the IEEE SECON Conference on Sept. 27, 2005, in Santa Clara, Ca. In his talk, Ephremides spoke about sensor networks from a perspective of wireless networking, discussing how sensor networks have become the ultimate catalysts for cross-layer network design.

### Chellappa Delivers Keynote Address on Biometrics at AutoID 2005 Conference

**Rama Chellappa** delivered the keynote address at the fourth annual IEEE Workshop on Automatic Identification Advanced Technologies (AutoID 2005),



Rama Chellappa

IEEE's only international conference on biometrics. The talk, titled "Biometrics for Remote Surveillance: Recent Advances in Face and Gait-Based Person Identification," focused on methods of recognizing individuals from a surveillance camera, an important security application for crowded public environments, such as airports.

### New MIPS Contract Awards Fund ECE Faculty Research Projects

ECE faculty are associated with five new Maryland Industrial Partnerships (MIPS) contract awards, which provide matching funding for university-based research projects that help companies develop new products.

Professor **Mark Shayman** is working with NetImmune, Inc. of Germantown, Md., to develop a high-speed prototype platform in a real network environment to detect and prevent Distributed Denial of Service and intrusion attacks. Professors **Gilmer Blankenship**, **Neil Goldsman**, and **Martin Peckerar** are working with TRX Systems, Inc., Lanham, Md., to develop a fire safe locator system that can centrally monitor the location, vital signs, and other situational data of first responders. Dr. Peckerar is also working with LaserLink Technology, LLC, to develop high performance Field Programmable Analog Arrays (FPAAs) and Field Programmable Mixed-Signal Arrays (FPMAs). Professor **Mario Dagenais** is working with Maxion Technologies, Inc., to develop a semiconductor laser for sens-

ing chemicals. Professor **John S. Baras** and Assistant Research Scientist **Nelson X. Liu** (ISR) are working with CI Technologies of Frederick, Md. to develop an alternative emergency wireless communication service for commercial users and first responders that enables cell phone carriers to switch calls to work over satellite links during emergencies.

### ECE Faculty Receive Patents for Research

A research team consisting of Professor **Christopher Davis**, Associate Research Scientist **Igor Smolyaninov**, and **Anatoly Zayats** of the Queen's University of Belfast has been issued U.S. Patent 6,897,436 for their invention titled "Optical Signal Processing Based on Light Controlled Photon Tunneling."

Professor **P.S. Krishnaprasad**, ISR Research Professor **Mikhail Vorontsov**, ISR Assistant Research Scientist **Eric Justh**, and Dr. **Leonid I. Beresnev** & Dr. **Jennifer Ricklin** of Army Research Laboratory have been awarded U.S. Patent 6,911,637 for "Wavefront phase sensors using optically or electrically controlled phase spatial light modulators."

Professor **Tony Ephremides** and alum **Deepak Ayyagari** (ISR) were awarded U.S. Patent 6,947,407 for "Power Control Based Admission Methods for Maximum Throughput in DS-CSMA Networks with Multi-Media Traffic."

### Maryland ECE Faculty Speak at Workshop on Swarming Behavior

Professor **Eyad Abed**, Professor **John S. Baras**, Professor **P.S. Krishnaprasad**, and Assistant Research Scientist **Eric Justh** (ISR) were featured speakers at the Workshop on Swarming in Natural and Engineered Systems this month.

The workshop brought together experts in artificial intelligence, control theory, robotics, systems engineering and biology to better understand swarming

behaviors in nature and applications of biologically-inspired models of swarm behaviors to large networked groups of autonomous vehicles.

Dr. Abed spoke on Formation Control with Virtual Leaders and Reduced Communications, while Dr. Baras spoke on Swarm Collaborative Intelligence: From Networked Control to Trust in MANET. Dr. Justh and Dr. Krishnaprasad's topic was Spatial Patterns in Cooperation and Conflict.

### Levine Co-Editor of New Book on Control Systems

Professor **William Levine** is co-editor of a new book titled *Handbook of Networked and Embedded Control Systems*. This useful reference is a carefully organized collection of tools, software, and technology related to networked & embedded control systems.

### Wu, Liu Co-Authors of Award-Winning Paper on Multimedia Forensics

A paper co-authored by University of Maryland researchers **Jane Wang**, **Min Wu**, **Wade Trappe**, and **K.J. Ray Liu** was awarded the European Association for Signal, Speech and Image Processing (EURASIP) Journal on Applied Signal Processing Best Paper Award for 2004. The paper was titled "Group-Oriented Fingerprinting for Multimedia Forensics." The research team pioneered an interdisciplinary approach to conducting research on digital fingerprinting for multimedia content protection, proposing a novel framework of group-oriented fingerprinting that exploits the behavior patterns of adversaries and provides superior traitor tracing capability over the prior art.

### Vishkin Named Program Chair for 2006 SPAA Conference

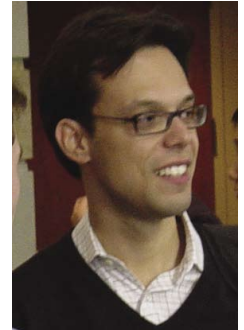
**Uzi Vishkin** has been named Program Chair for ACM's 18th annual Symposium on Parallelism in Algorithms and Architectures (SPAA). ☐

## Nuno Martins Joins ECE faculty

### Research focuses on Control Theory, Estimation, and Information Theory

The ECE department welcomed new Assistant Professor Dr. **Nuno C. Martins** to the University of Maryland in August.

Martins, who will also serve as an affiliate with Maryland's Institute for Systems Research (ISR), earned his Ph.D. in Electrical Engineering and Computer Science, minor



Nuno Martins

in Mathematics, from the Massachusetts Institute of Technology in 2004. He received the "Licenciado" and MSc. degree in Electrical Engineering and Computer Science from the Technical University of Lisbon, Portugal, in 1994 and 1996, respectively. He also completed a Financial Technology Option degree from MIT's Sloan School of Management in 2004. His primary research interests are in Control Theory, Estimation, & Information Theory.

Martins was an author of the European project titled "Leonardo da Vinci" in the area of Signal Processing. He was also one of five founders of the Evolutionary Systems and Biomedical Engineering Laboratory, located in the Institute for Systems & Robotics at Lisbon.

In 1999, while at the Laboratory of Information and Decision Systems at MIT, he played a major role in a DARPA project in the area of distributed resource allocation in adversarial environments. Most recently, Martins worked on a MURI project titled "Cooperative Control of Distributed Autonomous Vehicles in Adversarial Environments." ☐

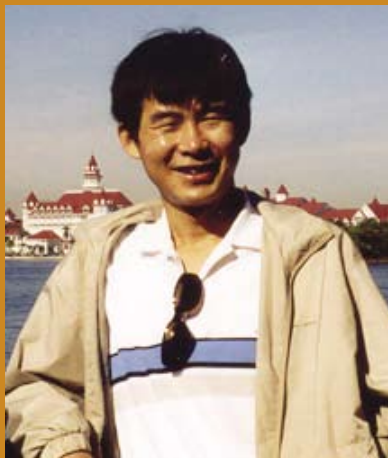
## In Memoriam: Huiping Xiang

On October 21, a tragedy took the life of one of the Department's promising graduate students, Huiping Xiang. Xiang died in a car accident in Beltsville, Md., while he was driving back home in the rainy night.

Huiping Xiang earned a bachelor's degree in engineering and economics and graduated with highest honors from China's Tsinghua University in 1996 before coming to the United States in 2000. He received his master's degree from Polytechnic University in New York in 2002, and was later admitted to the Department of Electrical and Computer Engineering at the University of Maryland. In addition to his engineering studies, Xiang had a broad interest in literature and history and is remembered for bringing laughter to his friends.

"Huiping took three classes with me,"

said Dr. **Rama Chellappa**, Xiang's advisor. "He was very much liked and many sought his friendship. I feel a deep sense



of sorrow that someone so young suddenly passed away. May his soul rest in peace."

"Since Huiping's tragic passing, I have come to know more about the vibrant, meaningful life he led with his wife, Daifeng, and the community he helped foster," said Dr. **Dan Balón**, Director of Graduate Academic & Student Affairs. "He

will be missed, and as the filled funeral chapel indicated, so many of us at Maryland are so saddened by his loss."

Xiang is survived by his wife, **Daifeng Han**, a fellow graduate of Tsinghua University and a doctoral candidate at University of Maryland at College Park, and his parents, who live in the rural Li County, Changde City, Hunan Province in central China.

A memorial fund has been established to help support Huiping's family. Contributions may be sent to:

Chinese Student & Scholar Association  
c/o Mr. Chao Wu  
Huiping Xiang Memorial Fund  
2158 A.V. Williams Bldg.  
University of Maryland  
College Park, MD 20742

Checks should include the memo "Huiping Xiang Memorial Fund." ☐

## 10 Department Honors MERIT Fair Winners

Student summer research project winners were announced at the Maryland Engineering Research Internship Teams (MERIT) Fair on Friday, August 22, 2005. MERIT is an 11-week summer program that offers top undergraduate engineering students from around the country the opportunity to engage in cutting-edge, team-based, cross-disciplinary research projects at the University of Maryland. The MERIT Fair marks the culmination of the students' research efforts, rewarding the best student research projects, and offering students the opportunity to present their work to the wider public. The 25 student participants' efforts were scrutinized by a panel of judges selected from academia, industry, and government laboratories.

In the Power and Energy Electronics Research (PEER) category, the winner



MERIT student participants pose at the annual MERIT Fair on August 22, 2005

was **Victor Huang** from the University of Maryland, who worked with Dr. **Michael Fuhrer** and Dr. **Alma Wickenden** at Army Research Laboratories on "The Role of Metals in Achieving n-Type Carbon Nanotube Field-Effect Transistors." Second place was awarded to **Frederick Housel** from the University of Southern California, who worked with Dr. **Ken Jones**, Dr. R.D. Vispute and Dr. **Shiva Hullavarad** on "High Temperature Capping Layers of AIN & BN for Development of SiC Based Power Devices."

In the Research Internship in Telecommunications (RITE) category, the winner was Maryland's **Amon Ducao** who worked with ECE Professor **Rama Chellappa** on "Recognition Through 3D Face Models." Second place was awarded to **William Eisenhower** from the University of Delaware and **Scott McMichael** from Case Western Reserve University, who worked with ECE faculty members Dr. **Pamela Abshire** and Dr. **Timothy Horiuchi** on "Biometrics & Robot Control." ☐

# ECE Students Win New Venture Challenge Business Plan Competition

Seven ECE students competed as finalists and three students won the undergraduate prize in the fifth annual University of Maryland New Venture Challenge business plan competition on May 6, 2005.

In the undergraduate category, **Armin Kiany** (B.S. in Electrical Engineering, 2005), **Payam Golriz** (B.S. in Electrical Engineering, 2005), and **Ramtin Kiany** (B.S. in Electrical Engineering, 2005) won the New Venture Challenge prize for the business plan put together by their team, "ARTKIA." The team's plan is to develop a complete PDA-based solution for restaurant management. ARTKIA was awarded \$12,500 to put their venture into motion.

Also a finalist in the undergraduate category was **David Johnson**, a UMCP Computer Engineering major, whose team "Avere" is developing a software system



The ARTKIA team celebrates their New Venture Challenge business plan competition victory

to help consumers live healthier lives by offering them detailed information about their food purchases.

In the graduate category, **Kun Lin** (B.S. in Computer Engineering and Finance, May 2005), **Ogbonia Orji** (B.S. in Electrical Engineering and Management Science/Stats, May 2005), and **Josef Yeager** (B.S. in Computer Engineering,

May 2005) were runners-up for the plan submitted by their team, "SecureGo." SecureGo is developing a Universal Serial Bus (USB)-based device that provides secure online shopping and online banking capabilities. SecureGo was awarded \$5,000 by New Venture Challenge.

The University of Maryland's New Venture Challenge was established to find new venture ideas and build successful businesses, as well as to provide education and networking opportunities for students. Winners receive cash prizes to help establish their businesses. The competition is open campus-wide each year to University of Maryland undergraduate and graduate students, and is sponsored by the Maryland Technology Enterprise Institute (MTECH) and Hinman Campus Entrepreneurship Opportunities (CEOs) Program. ☐

## ECE Student Achievements & Recognition

ECE graduate student **Yinian Mao** and Ph.D. alumnus **Damianos Karakos '03** were among a select group invited to the 2005 IBM Symposium on User Interface and Signal Processing Technologies at IBM's T.J. Watson Research Center in Yorktown Heights, NY, on September 19. Mao is advised by **Min Wu** and Karakos was advised by **Adrian Papamarcou**.

ECE Ph.D. student **Nathan Moody** received the Directed Energy Professional Society's 2005-2006 Graduate Scholarship in recognition of his work towards developing robust, efficient photocathodes, which are used to produce high quality electron beams. The work was sponsored by the Office of Naval Research and the Joint Technology Office. Moody is advised by ECE Chair **Patrick O'Shea**.

ECE Ph.D. student **Heba Yuksel**, who is advised by **Christopher Davis**, recently presented two papers at the International Society of Optical Engineers

(SPIE) Optics and Photonics Meeting in San Diego, July 31 - August 4, 2005. For her efforts, she received a Research Excellence Award, which included a cash award to pay for her expenses in attending the meeting.

**Brian Morgan**, a graduate student advised by **Reza Ghodssi** and based in the MEMS Sensors and Actuators Laboratory, has won a 2005-2006 Achievement Rewards for College Scientists (ARCS) Scholarship. Morgan also won the scholarship in 2004-2005.

ECE undergraduates **Qin Zou** and **Divya Jhalani** received the International Engineering Consortium's William L. Everitt Student Award of Excellence. The award honors outstanding seniors in electrical and computer engineering at affiliate universities across the U.S. who are in the top 10% of their class and have an interest in the communications field. ☐

## Mainak Sen Named President of ECEGSA

**Mainak San** was named president of the Electrical and Computer Engineering Graduate Student Association (ECEGSA).



Mainak Sen

"I have found Mainak to be an excellent advocate for our students and genuinely caring in making sure that we do what is best for them," said ECE Director of Graduate Academic and Student Studies **Dan Balón**.

Sen has been an active participant in the ECEGSA in recent years, holding leadership positions and serving as a student representative to the Graduate Studies and Research Committee. Sen also played an important role in helping the department with recruitment activities last year. ☐

# ECE Student Profile: Kevin Galloway



“I was born and raised in Escondido, CA, and attended the U.S. Naval Academy, where I graduated in 1997 with a B.S. in Systems Engineering. Upon graduation, I was commissioned as an officer in the U.S. Navy. I served seven years of active duty, including a tour as the Strike Officer on a destroyer.

I originally was attracted to Maryland’s ECE department because the program was highly ranked and had a broad spectrum of research activi-

ties. Since I did not yet know what specific area I wanted to focus on, I liked the idea that there were many options to choose from. When I visited, I was impressed by how welcoming the department was and how Professor Krishnaprasad set apart more than an hour of his time to meet with me and then introduce me to current graduate students.

I’m currently doing research in the Intelligent Servosystems Lab. I’m interested in control of groups or swarms of robots, especially the applications to Unmanned Vehicles.

I’m particularly grateful for my opportunity to serve as a Teaching Assistant, and I’ve found that the interaction with students has been very stimulating and fulfilling. I was honored to receive an award from the Center for Teaching Excellence as a Distinguished Teaching Assistant for 2004–2005.

The students here are hard working, friendly, and ambitious. Rather than cutthroat competition, I’ve found

an eagerness to share ideas and encourage one another’s work.

Professors are approachable, dedicated to quality research, and experienced as lecturers.

After I graduate, I would like to pursue a position as a university professor, as I feel like it would be the perfect blend of my love for teaching and my love for engineering. The ECE program is helping me to pursue this goal by challenging me with difficult courses that lay an excellent groundwork of knowledge.”

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Connections is published twice yearly for alumni and friends of the Department of Electrical and Computer Engineering at the University of Maryland.

Alumni news and comments are welcome. Please send them to: Ted Knight, Department of Electrical and Computer Engineering, 2405 A.V. Williams Building, College Park, MD 20742.

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