



FALL 2014

# CONNECTIONS

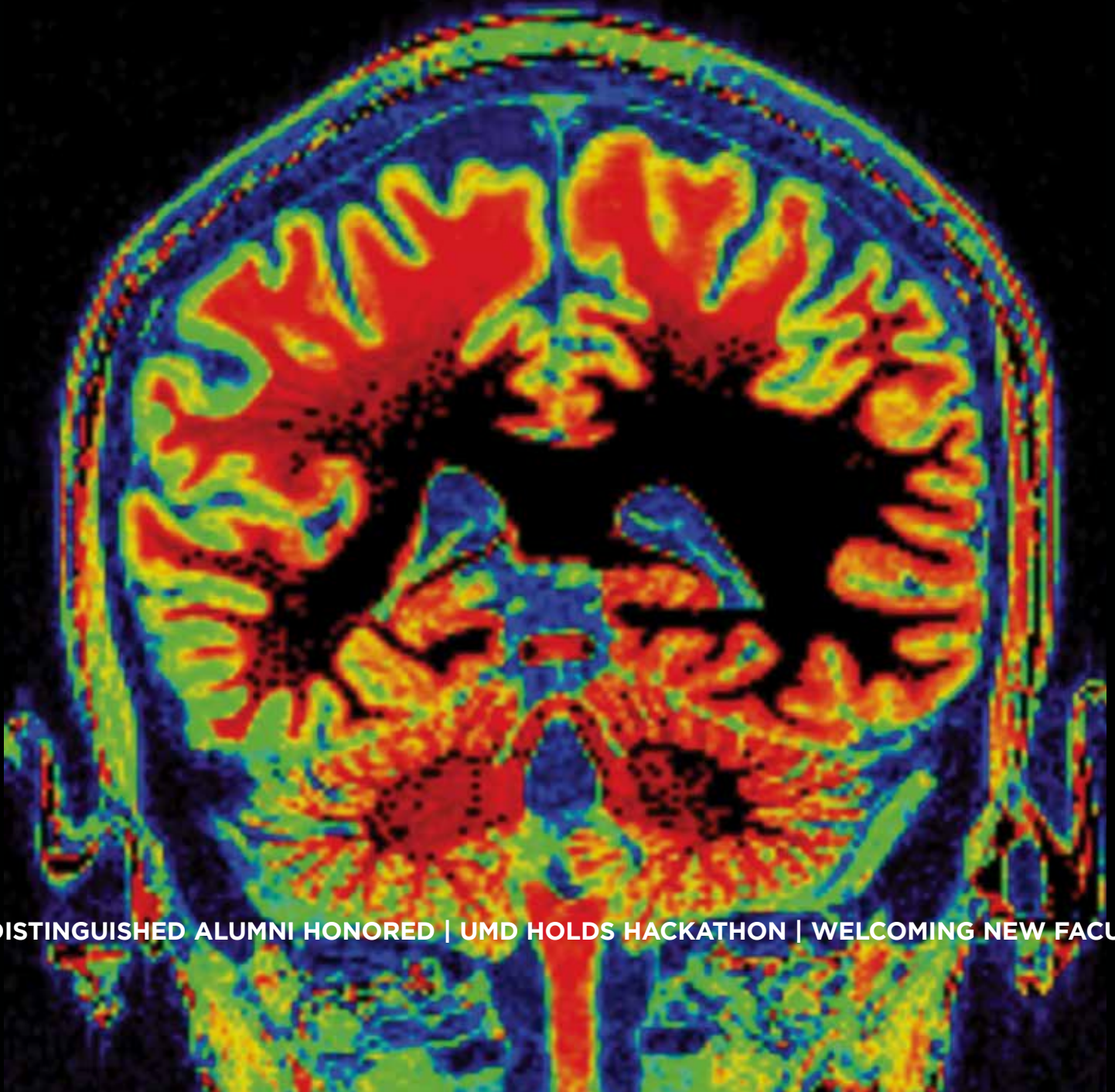
DEPARTMENT of ELECTRICAL & COMPUTER ENGINEERING

A. JAMES CLARK SCHOOL of ENGINEERING

[www.ece.umd.edu](http://www.ece.umd.edu)

## “Think Like An Engineer”

Four ECE alumni find success in non-traditional careers.



DISTINGUISHED ALUMNI HONORED | UMD HOLDS HACKATHON | WELCOMING NEW FACULTY

# message from the chair



RAMA CHELLAPPA

As you receive this message, the university is an official member of Big Ten. We are also part of the Committee on Institutional Cooperation, which affords us collaborative research opportunities with other prestigious ECE departments. We are excited by the tremendous opportunities this union affords to leverage resources, share expertise, and watch exciting sports, yet we are most proud to be among the most recognized leaders in research and education.

Today, we are preparing our students for a future in which most modern technological advances will have elements of electrical and computer engineering. Their ideas will power the world. We teach them to think like engineers and to seek solutions using acquired knowledge and innovative application of concepts. For a percentage of our alumni, this training has translated into very successful, yet unexpected, careers. ECE graduates are doctors, lawyers, investors, and musicians. Rather than be limited professionally by their educational pursuits, they have used their technical knowledge and analytical skills as the foundation of their new careers, helping them to understand complex business matters, patents, or technology in modern medicine.

This issue of *Connections* features alumni who have built upon the foundation of their electrical and computer engineering degrees to successfully take on the challenges of medical and dental school, law school, investing and entrepreneurship positions.

As the chair, I am inspired by our students, faculty, staff and alumni to raise the department to new heights. While traditional electrical and computer engineering will always be at the core of our mission, our faculty members, alumni, and students look upon the field with a new perspective, thus driving innovation in our classrooms and research. Our department is growing; this past spring, two assistant professors (Drs. Behtash Babadi and Piya Pal) joined us in the area of signal processing and one assistant professor (Dr. Mohammad Hafezi) in the emerging area of quantum computing. The diversity of research topics the new assistant professors are involved in and the new courses they will be offering to our students will move the department in new directions.

To welcome our new undergraduate students, we celebrated their arrival at a “back to school” event in Fall 2013 and sent off our graduating seniors at an event in May 2014. With the addition of new faculty members mentioned above we are able to add new sections to core undergraduate classes, thereby reducing the class size. We have also invested significant funds for upgrading most of our undergraduate laboratories. Beginning in Fall 2015, we will expand our presence in southern Maryland by accommodating transfer students from that region. Finally, we are working to introduce a gadget-driven freshmen course on “what is cool about ECE.”

For continuing to improve the department, I need your help. It is my sincerest hope that you will take this opportunity to support ECE in a way that is meaningful to you—whether that means supporting current research, lab improvements, education, or extracurricular activities. Our alumni are instrumental in helping us improve our program through their time, expertise, and financial support whether personal or through industry sponsorship.

In the spring of 2015, we will hold an ECE Research Day to showcase the timely and compelling research currently taking place in the department. We hope that you’ll join us to see the benefits of our research and the fruits of your generosity. To stay informed of events, visit [www.ece.umd.edu/events/index.php](http://www.ece.umd.edu/events/index.php).

I look forward to leading our continued advance. To discuss any of the priorities outlined or the plan for your personal giving, please contact our Director of External Relations, Amanda Stein, at [steina@umd.edu](mailto:steina@umd.edu). Thank you for supporting our department.

*Rama Chellappa*

MINTA MARTIN PROFESSOR OF ENGINEERING

## FAST FACTS & FIGURES ON OUR 2014 - 2015 STUDENTS

### *Fall 2014 Freshmen*

Total students: 147

Average SAT score: 1409

Average GPA: 4.334

Scholarships: 91 students received either a University and/or Clark School Scholarship  
8 students are Banneker/Key Scholars

### *Fall 2014 All Undergraduates*

Total undergraduate students: 899

Electrical Engineering majors: 518

Computer Engineering majors: 381


- This is the largest number of Computer Engineering students in the program since 2004
- Our total number of students is the largest enrollment in the department since 2004 as well

### *Fall 2014 Graduate Students*

Ph.D. Students: 232

M.S. Students: 94

Average quantitative GRE score of new students: 165/170

- Students join ECE from: Bangladesh, China, Cameroon, Egypt, India, Iran, Pakistan, Turkey, Taiwan, USA
- Areas of Research:
  - Applied Electromagnetics
  - Bioelectronics and Systems
  - Circuits and Systems
  - Computer Engineering
  - Communications & Networking
  - Control, Robotics, and Dynamical Systems
  - Electronic Materials and Devices
  - Optics and Photonics
  - Signal Processing 

*The cover photo was provided by Professor Ellen Lau, who is a colleague of Professor Jonathan Simon in the MEG lab. Her research is aimed at linking what we know about language to what we know about the brain, with the goal of developing better models of language processing and the neural mechanisms underlying it.*



## 2014 ECE Graduate Heads to Law School at UC Berkeley

*A young woman realizes the potential her electrical engineering degree affords: an opportunity to tackle any career she desires.*

Lida Ramsey graduated with her degree in electrical engineering this past May. She also has a degree in English and will attend the University of California, Berkeley this fall to study law. Upon completion, she plans to work in patent law.

**Q: Did you initially plan to double major in English and electrical engineering?**

A: Initially, I only planned to pursue a degree in electrical engineering. I added English as a double major near the end of my sophomore year and finished the requirements for that degree first.

**Q: Why did you choose to study in both tracks?**

A: I did not plan to pursue both tracks concurrently. I wanted to study EE because I love the study of physics and wanted a degree that made this interest more applicable to my career goals. After my first year in electrical engineering, I realized that I wasn't feeling completely intellectually fulfilled and I craved the intellectual study of humanities—specifically English literature, a subject I have always passionately enjoyed.

**Q: What sparked your interest in engineering? Why was electrical engineering compelling to you?**

A: In high school physics, circuits were my favorite topic. It was the way the mind was forced to think, in terms of solving a puzzle, which felt compatible with the way I think. At matriculation, I wanted to challenge myself and was eager to choose a rigorous path. I became interested in engineering in general during the RISE program I participated in with Dr. Paige Smith the summer before my freshman year. There, not only did I find a best friend that I am currently traveling with, I also

was introduced to the potential of what an engineering degree would bring, especially as a woman. An engineering degree is like a stamp signifying that



LIDA RAMSEY

an individual has trained his or her mind into a resourceful problem solver. With that comes a degree of power and capability that can be transferred to any career path. I think it's important for women to fearlessly pursue this skill if it is something they want to do.

**Q: How does it feel to be a new alumnus and very recent graduate?**

A: I feel very accomplished. It has been a long road and I'm proud of myself for following through.

**Q: At what point in your undergraduate career did you decide to pursue law school? Why?**

A: I thought about attending law school during my first spring semester after returning to ECE UMD (2012). I made the final decision to apply in the summer of 2013. I met a girl attending American University Law School who told me about the demand for patent attorneys with an ECE background. In theory, I knew that my dual background was a perfect fit for this path but I wanted to make sure it would feel right in practice. I spent the year networking with current attorneys and law students to get the best feel for what this path would be like.

**Q: How do you think your experiences in ECE will shape your experiences in law school? Have your studies uniquely prepared you for law school?**

A: I think my experience in ECE has taught me that I am capable of achieving much more than I can realistically imagine. It has taught me how to ignore self-doubt and take things day by day. I have also learned that the key to my success lies in cutting ties with the notion of perfection and simply doing the best I can given the time and resources available. Specifically, my ECE studies have made me a much more durable candidate for law school.

**Q: How do you think your interests in engineering will continue to manifest in your life?**

A: I have learned that engineering is mainly a mindset. It can be applied in so many ways. This realization was the catalyst for my return to ECE after graduating with my BA in English.

**Q: What advice would you give to a student beginning their ECE career right now? To rising seniors seeking career direction?**

A: I would say that if there is a subject in ECE that interests and excites you, march on. Do not be afraid of pursuing something that is hard. It only makes the end so much sweeter. And perhaps most importantly, do not be afraid to be unique. It is something that will set you apart and work in your favor in life. Look for what makes you unique and exploit that. To the prospective graduates, I would emphasize my earlier answer and I would also say not to rush. Get the most experience you can because it will never hurt and can only help you find the best career fit for you. ☺

# Engineering New Directions

*Four engineers with various ECE degrees find success as a neurosurgeon, venture capitalist, sound engineer, and lawyer because they applied their abilities to “think like engineers”.*

## The Neurosurgeon

Upon graduation, Mark V. Smith (BSEE, '80) had no idea that his future would take an unexpected turn toward a science more aptly described as an art.

Smith, who was raised in Columbia, Maryland, chose to pursue his college education at the University of Maryland because he saw great value in the excellent engineering program at a state school “just down the road.” Engineering was not the first career to which Smith had aspired—he wanted to be a medical doctor, but feared he did not have the grades to get into medical school.

“I was an average student in high school, except I was a whiz at math and physics, so I chose to pursue a related subject in college,” he said. “My father was a mechanical engineer, and after deciding against a pre-med track, I chose engineering.”

Smith truly enjoyed his time at Maryland. He made many friends in the Hartford dorm and was involved in the Newman Center and the campus's Catholic community. His favorite class was advanced calculus because he learned how to understand mathematical theories and apply his knowledge to any problem. Doing so fanned his desire to learn material and understand scientific concepts beyond rote memorization, and he developed an interest in the emerging field of biomedical engineering. Smith eventually chose electrical engineering upon the advice of an advisor, since it was the most closely-related field at that time.

Smith dove into the challenges of electrical engineering, especially the elements of math and physics in the

science. After a class with Prof. Robert Newcomb, Smith spent time at his office hours, becoming acquainted with Newcomb's pursuits as a researcher, too. Beyond the classroom, Newcomb,



Smith, and alumnus Dr. Nikitas Dimopoulos collaborated on research studying the electrical circuitry of the cerebellum. The results of their research comprised Smith's first paper, “Some Observations on Oscillations in Neural-Type Networks,” which he co-authored with Newcomb and Dimopoulos and published as part of the 33rd Annual Conference on Engineering in Medicine and Biology.

Smith graduated magna cum laude. Intent on pursuing a career in biomedical engineering, he found a mentor in Prof. Nicholas DeClaris, former chair of ECE and prominent figure in the University of Maryland Medical School. Smith was hired as the chief of biomedical engineering at the University of Maryland's Shock Trauma Unit by its founder, Dr. R. Adams Cowley.

Working in this role reinforced his desire to be a medical doctor, and after starting his new position, he began taking the prerequisite courses for medical school in the evenings.

“As I worked in this position at

Shock Trauma and with the FDA one summer, I realized that biomedical engineering was simply engineering for biomedical purposes,” Smith said. “I had a passion to work with patients, which drove me to embark on my dream of medical school.”

Smith graduated from the University of Maryland Medical School in 1986 and began a residency in neurological surgery at SUNY Health Science Center in 1988. He received fellowship training in pituitary surgery at George Washington University and in epilepsy surgery at the University of Washington.

“Epilepsy surgery was where my education in electrical engineering and my work as a surgeon converged,” Smith said. “As a neurosurgeon specializing in epilepsy surgery, electrical impulses in the brain are what guide the surgical procedure rather than a visible abnormality.”

According to Smith, many doctors rely on a significant amount of technology, but because of his background in engineering, he knew when to rely on data provided by technological tools and when to question its validity.

Smith retired from his private neurosurgery practice in December 2013 to enjoy life at a slower pace. He is now able to pursue other interests, and in another about face, he has turned back toward engineering and is working on some of the many invention ideas that came to him during his years of practice. He also was recently asked to join the board of directors for Kelyniam Global, Inc., a medical device manufacturing company that

specializes in the production of custom neurological prosthetics utilizing computer-aided design and computer-aided manufacturing of advanced medical grade polymers.

Smith will also pursue an opportunity to teach neurosurgery techniques to Mongolian neurosurgeons in the fall.

“This opportunity will fulfill one of my heart’s desires,” he said. “I’ve always felt called to help those less fortunate through my medical career, and in Mongolia I will be teaching and sharing my knowledge—something I truly love and enjoy.”

Smith added that life is full of surprises and does not always follow a set path.

“I just continue to pursue my God-given talents and desires the best I can,” he said. “My life has been very hard, fun, and exciting all at the same time. As I look back, I’m not sure I could have planned it better if I had tried.”

### **The Audio Engineer**

Stuart Martin (BSEE, ‘00) first visited a radio station at age ten. He was doing a report on sound effects, and the sound engineer gave him some rudimentary equipment to make effects of his own. He got an A and continued to be inspired by what he had learned. It is a natural connection to his love of music; Martin plays guitar and other stringed instruments.

He was also intrigued by tinkering with electronics—especially things with speakers.

“I grew up in a Virginia farming community—you take things apart to make them work again. I started experimenting as a kid with electrical equipment from the ‘30s, ‘40s, and ‘50s. It had very unique character; I was fascinated by these works of art.”

After high school, these interests converged; Martin played the local music circuit and worked as an audio engineer in various studios during the ‘80s and ‘90s. In this role,

he manipulated sound to produce desired effects before recording, mixing, and mastering music for other musicians. “I really wanted to know more about electronics and vacuum tube amplifiers—I wanted to be knowledgeable rather than just experimenting until something worked,” Martin said.

While working at Pacifica Network News and NPR, Martin decided to go back to school to learn how the electronics he used every day worked. In 1996, Martin joined the electrical engineering program at the University of Maryland.

“It excited me to meet other students who, even though they were younger, understood that we had to focus on the work to be done to do well. The ECE Department engendered that mindset very well,” said Martin.

Martin enjoyed many of his experiences in ECE, including the systems and logic of his CMOS course, the exciting challenge of higher math, his physics courses, and, most of all, learning from Professor Isaak Mayergoyz. “I took basic circuits from him. He is great at helping you figure out how to derive answers for yourself.”

While at ECE, Martin cared for his children and worked part time; he persevered because he enjoyed the stimulation of challenging himself. “I found it rewarding to have a fundamental understanding of what I did every day rather than just a technical understanding or operator’s knowledge,” he said, likening the moment that his technical skills and his newfound fundamental knowledge converged to “fireworks going off.”

After completing his degree, Martin worked at the National Institute of Standards and Technology (NIST) as an engineer

trainee, then for a defense contracting company as an RF engineer. While pursuing his studies and working, Martin opened Stonebridge Music, his own full-service studio with in-house and remote recording, mixing, and mastering for music and voice overs. Highlights of Martin’s work include recording, mixing, and co-producing the Stray Birds’ debut album, which NPR awarded “Top Ten of 2012” and the Steel Wheels’ “Lay Down Lay Low,” which won the Independent Music Awards for Best Americana Album of 2012. He has also recorded Frank Vignola, Mike Auldridge, Bill Emerson, Orrin Starr, and Jonathan Edwards.

Martin’s knowledge of electrical engineering was very helpful as he constructed his studio. Using his knowledge of electrical currents, radio frequency, and electrical systems, he was able to affect the quality of his recording studio. “Electricity moves at the speed of light and circuits impress character upon the signal transferring to it; it’s the same way sound waves transmit through air and obstacles,” Martin said.

He continued his career in audio engineering, music, and recording because it is what he wanted to do. His advice for others is straightforward: “There are many jobs with a need for lateral thinking; where you can relate something to what you have learned. If you feel empowered to do something



STUART MARTIN PREPARES FOR A RECORDING SESSION AT HIS STUDIO, STONEBRIDGE MUSIC.



(continued) other than engineering—that’s great!”

## The Lawyer

Gregory Lyons (BSEE, '86; MSEE, '88), a lifelong resident of Montgomery County, entered the University of Maryland in the fall of 1981. He chose to attend the University of Maryland for two primary reasons—he received a



GREGORY LYONS

scholarship covering his tuition for four years and had long respected then-Vice Chancellor Brit Kirwan, whom he knew quite well. As an engineering major, Lyons was able to take a course in each discipline. He tried aerospace engineering, mechanical engineering, and civil engineering before committing to studying electrical engineering. “I took EE 204 and felt that the concepts and skills I would gain in electrical engineering would give me the most flexibility to pursue anything I wanted,” he said.

Lyons was also accepted into the general honors program, which required him to take courses in other academic areas, including the humanities. His academic achievements resulted in his election to various honors societies including ODK, Mortar Board, Eta Kappa Nu, and Tau Beta Pi. As a senior, Lyons won the Harry C. Byrd award. Lyons also volunteered as a peer tutor under Dr. Marilyn Berman, who was the associate dean of engineering.

Lyons explained, regarding his electrical engineering studies, “I had a number of adjunct professors, some from local companies, who were excellent teachers. I enjoyed my undergraduate studies and thrived in classes I took with Dr. Striffler and Dr. Granatstein.” As his senior year came to a close, Lyons had job offers from BellCorp and various consulting firms.

Lyons’ shift away from an engineering career germinated during a presentation he attended his junior or senior year. During that presentation, current graduate students in electrical engineering presented “Going to Grad School at Maryland.” Likewise, the consulting firms with which Lyons had interviewed, including Booz Allen Hamilton and SAIC, suggested that their engineers either had Master of Science degrees or were working toward them. Lyons graduated summa cum laude before continuing on to earn his master’s degree.

During his graduate studies, Lyons realized his interests were much broader than simply solving technical problems as an engineer. His exposure to the humanities also provided a viewpoint and skills that led him to consider other career opportunities. Having ultimately decided to pursue a legal career, Lyons realized that a combination of degrees in engineering and law would afford him a very unique skill set and a more personally rewarding career. “Being successful in business did not require a specific degree, but being a successful lawyer did,” he said.

Lyons chose to attend Harvard Law School, where he graduated cum laude. Today, he is a partner at Wiley Rein in Washington, D.C., practicing in the areas of intellectual property, litigation, and food and drug law. Lyons represents a wide variety of corporations in matters relating to enforcement and defense of patent and intellectual property rights. He also assists clients in connection with patent due diligence matters and intellectual property portfolio valuation.

Lyons values his experiences at Maryland, explaining, “My education in ECE prepared me for law school and the practice of law because I gained the ability to think analytically and apply critical thinking skills in unique ways. I also appreciated the willingness of the ECE faculty to answer questions in office hours and outside of class—their efforts

to help you were significant if you made an effort to learn. Today, a number of my clients are scientists or engineers; my engineering background is often critical in representing them fully.”

He fondly recalls his time spent at ECE, and said that two of his closest friends are ECE alumni. “My ECE education is the foundation for my career. Engineering will not preclude you from doing something else—that is the beauty of an electrical engineering degree—it provides foundational knowledge. Use that knowledge and merge it with your other interests to strive toward a career you will truly enjoy.”

## The Venture Capitalist

Pascal Luck (MSEE, '86) is a venture capitalist. After completing his master’s thesis requirements in the fall of 1985, he went to work for AT&T/Bell Labs.

While studying in the Department of Electrical and Computer Engineering, Luck said that he found a mentor in his thesis advisor.

“I spent significant time reviewing my work with Professor Panos Ligomenides; even meeting at his favorite Greek



PASCAL LUCK

restaurant in Washington, DC. I also took classes that reminded me that, no matter how much you think you know, you will finally reach the limits of your mastery,” Luck said. For me, that class was EE621, a course in probabilistic methods for communications. In retrospect, it was a splendid life lesson—more force [studying] does not always lead to a more positive result.”

While at AT&T, Luck was joined by ECE classmates with whom he remains close. “When I joined AT&T/Bell Labs, the key threat to their dominance in the switching products business was

Nortel, the first company to develop and market an all-digital switch. While considering clear engineering challenges, the competitive pressures and market dynamics associated with trying to ‘catch up’ with this ‘creative innovator’ created significant business issues that drew me in.” Required to provide technical support to a number of externally directed strategic initiatives at AT&T, Luck found himself more deeply entrenched in the business world—the impetus for him to apply to the full-time MBA program at Wharton School of Business and accelerating his move out of a purely engineering-focused career. After graduation, he had interest in pursuing venture capital, but could not find an opportunity in the field.

Luck joined the consulting division at Touche Ross, where he undertook projects focused on market strategy and finance. In time, Luck took the Chartered Financial Analyst (CFA) exam and became increasingly involved in valuation-related projects.

“After five years of consulting, I dusted off my original contacts in venture capital and expanded my network to include a number of the financial and venture leaders in Washington. An introduction to Stuart Yarbrough, who was starting a boutique merchant/investment banking firm in DC, led to an opportunity marking the start of my career in venture capital. We started an advisory firm focused on mid-market mergers and acquisitions,” Luck said. He saw that firm through a successful merger and was asked to join Core Capital Partners (Core) when they raised their initial fund.

At Core, Luck is currently one of three partners in the fund. They have, over the course of the company’s history, invested in approximately 60 companies. “My role is to both evaluate and recommend new

investment opportunities; then, after investing, to guide and provide oversight at the board of directors level,” said Luck. For Luck, the first investment in a company is often the start of a long relationship, and much of his role at Core focuses on providing ongoing advice and guidance for their portfolio companies.

Luck’s degree in electrical engineering provided a significant set of technical underpinnings that help him evaluate technical opportunities and dig into complicated ideas. Of his education at ECE, he said, “More importantly, it is the analytical rigor I learned in my engineering pursuits which I rely on the most. Whether evaluating a new business model or technical idea, it’s the analytical thought process I learned at Maryland that I fall back on daily.”

Luck feels that the analytical rigor and confidence to tackle technical problems, the touchstones of an ECE education, will serve anyone who pursues a path outside of a pure engineering career. Like a true financier, he has a message for anyone looking to follow a similar path. Luck advises, “Persevere. Different paths are not always easy to navigate; moving from one field to another depends on the person and situation. The only way to navigate this is to talk with as many people about your intended goal as possible and expect that the path will take longer than anticipated. However, the end goal may be well worth the investment.” ☑

## An ECE Grad in Dental School

Michael Powers is a 2013 ECE graduate. He completed his degree in electrical engineering with a focus on power systems. Currently, he is enrolled at the University of Maryland Dental School pursuing his Doctor of Dental Surgery (D.D.S.) He offers his perspective on transitioning from engineering to new career goals.



MICHAEL POWERS

**Q: How did you become interested in engineering?**

A: Cutting-edge technology always fascinated me and I desired to better understand how it worked.

**Q: How does it feel to be a relatively new alumnus and recent graduate of ECE?**

A: I am a proud alumnus of the A. James Clark School of Engineering and ECE. I will always remember my time at UMD fondly.

**Q: Did you have a favorite course, instructor or subject area while in ECE?**

A: I really enjoyed all of my courses in power systems. The subject was taught from a very applicable point of view with respect to daily life.

**Q: At what point in your undergraduate career did you decide to pursue dental school? Why?**

A: During my sophomore year, I decided to pursue dentistry as a career. At that point I had worked in the field of engineering for four years during summers and winters. I enjoyed my job but preferred to have a direct impact on society. Engineers mostly work behind the scenes, whereas medical professionals work directly with the public. Despite my early decision for a different career path, I love math and engineering, and so followed through with my EE degree.

**Q: Do you think your studies in ECE will have uniquely prepared you for the rigors of dental school?**

A: My experience in EE developed my problem solving skills and study habits which have allowed me to handle the rigors of dental school and approach issues pragmatically. The habits I developed in ECE have translated to success in my current studies.

**Q: Are you interested in a particular area of dentistry?**

A: I am interested in the high-tech aspect of dentistry. The whole field is changing and much of that is due to innovations in hardware and software developed by ECE graduates.

**Q: Where do you imagine yourself ten years from now?**

A: I plan to be working in private practice as a dentist and hope to establish a successful practice and provide state-of-the-art care to my patients.

**Q: How do you think your engineering interests will manifest in your life?**

A: In my free time, I will always take strong interest in all things technological. The understanding and appreciation that I developed as an EE will carry through.

**Q: What advice would you give to a student beginning their ECE career right now?**

A: Stay on top of your work, develop good study habits, and have fun. Make the most of your time in undergrad.

**Q: What would you tell rising seniors who are seeking career direction?**

A: Choose a career that makes you happy. ☑

# Awards and Honors for ECE Faculty

## BARAS NAMED SIAM FELLOW

Professor **John Baras** (ECE/ISR) was selected as a fellow of the Society for Industrial and Applied Mathematics (SIAM). Baras was recognized for his “contributions to systems theory, stochastic control and communication networks.” Baras has previously been named a fellow of the Institute of Electrical and Electronics Engineers and the Royal Swedish Academy of Engineering Science.

## CHELLAPPA NAMED ACM FELLOW

Minta Martin Professor of Engineering and Department Chair **Rama Chellappa** (ECE/UMIACS/CfAR) was named a 2013 fellow of the Association for Computing Machinery (ACM). He was recognized for contributions to image processing, computer vision, and pattern recognition. Chellappa’s research areas include signal and image processing, computer vision, pattern recognition, multi-dimension stochastic processes, statistical interference, image analysis, robust and secure biometrics, and artificial intelligence in computer vision.

## DAVIS PUBLISHES TEXT BOOK

Minta Martin Professor of Engineering **Christopher C. Davis** (ECE/ISR) has recently published the second edition of his textbook entitled, “Lasers and Electro-Optics: Fundamentals and Engineering.” The book covers a broad range of topics in modern optical physics and engineering. Deemed “invaluable for students studying laser physics, optoelectronics, photonics, applied optics and optical engineering,” the newly reorganized textbook gives a detailed introduction to the basic physics and engineering of lasers, a wide range of optical systems and electro-optic devices.

## ECE FACULTY EARN PROMOTIONS

ECE professors **Gang Qu**, **Jonathan Simon**, and **Ankur Srivastava** were promoted to Full Professor. These appointments were approved by President **Wallace Loh**, and became effective on July 1, 2014.

## EPHREMIDES WINS 2014 IEEE MILCOM LIFETIME TECHNICAL ACHIEVEMENT AWARD

Cynthia Kim Eminent Professor of Information Technology **Anthony Ephremides** has been awarded the 2014 IEEE MILCOM Lifetime Technical Achievement Award. Ephremides is the 17th recipient of this award; it will be presented at the annual Military Communications Conference this October. This award recognizes long-term important technical contributions to military communications as evidenced by significant, high-quality, and technical publications in the unclassified records of the IEEE Military Communications Conference.



ANTHONY EPHREMIDES

## GHODSSI NAMED UNIVERSITY DISTINGUISHED SCHOLAR-TEACHER

Congratulations to Professor **Reza Ghodssi**, who has been selected as a 2014-2015 Distinguished Scholar-Teacher by the University of Maryland. Ghodssi is the Herbert Rabin Distinguished Chair in Engineering, director of the Institute for Systems Research (ISR) and director of the MEMS Sensors and Actuators Lab (MSAL) in the Department of Electrical and Computer Engineering (ECE) and the Institute for Systems Research (ISR) at the University of Maryland (UMD). Ghodssi joins numerous colleagues in receiving the award, including professors **Min Wu**, **Carol Espy-Wilson**, **Patrick O’Shea**, **K.J. Ray Liu**, **Howard Milchberg**, **Michael Fu**, **Rama Chellappa**, **Steven Marcus**, **Isaak Mayergoz**, **William Destler** and **Christopher Davis**. The Distinguished Scholar-Teacher program recognizes faculty members who have demonstrated outstanding scholarly achievements and

equally outstanding accomplishments as teachers.

## KHALIGH NAMED ASSOCIATE EDITOR OF IEEE TRANSACTIONS

Assistant Professor **Alireza Khaligh** (ECE/ISR) has been named an associate editor of IEEE Transactions on Transportation Electrification (TTE). TTE is published by the IEEE Electric Vehicles Community. (link is external) It focuses on components, sub-systems, systems, standards, and grid interface technologies related to power and energy conversion, propulsion, and actuation for all types of electrified vehicles including on-road, off-road, off-highway, and rail vehicles, airplanes, and ships.

## KISHEK NAMED APS FELLOW

Research Professor **Rami Kishek** has been named a 2013 American Physical Society Fellow. APS fellows are limited to one half of one percent of the total APS membership; in being named a fellow, Kishek is joining an elite group of fellow researchers whose contributions to the theory and applications of physics inform and advance our understanding of the universe, from the smallest to the largest particles. Kishek was nominated for the honor by the Division of Physics of Beams. He is being honored “for ground breaking theory of multipactor discharge, and for contributions to the understanding of physics of space-charge-dominated beams.”

## MILCHBERG PUBLISHES IN PHYSICAL REVIEW X

Professor **Howard Milchberg** recently published work from UMD’s Intense Laser Matter Interactions Group, in Physical Review X, the American Physical Society’s (APS) online, open access peer-reviewed journal. The lab’s research also received mention in articles in APS Viewpoint, Physics Today, Science News, and Nature News. The article, “Demonstration of Long-Lived High-Power Optical Waveguides in Air” details the work of Nihal Jhajj, Eric





Rosenthal, Reuven Birnbaum, Dr. Jared Wahlstrand, and Prof. Milchberg. Their research involves the channeling of a laser beam through gas. Milchberg and his team created a way to use femtosecond filaments to create a virtual fiber-optic, allowing for the laser to travel through the air at a higher power and for a longer range than previously demonstrated.

### MUNDAY RECEIVES SPIE EARLY CAREER ACHIEVEMENT AWARD

Assistant Professor **Jeremy Munday** has been named the recipient of the 2014 SPIE Early Career Achievement Award. SPIE is the international society for optics and photonics. The society advances an interdisciplinary approach to the science and application of light, and this award recognizes “significant and innovative technical contributions to any of the engineering or scientific fields of interest to SPIE.” Munday is being honored for his “innovative experimental and theoretical work on photonic engineering for solar energy devices and Casimir forces.

### PAL WINS WILTS PRIZE

**Piya Pal**, a new faculty member, was recently awarded the 2014 Charles and Ellen Wilts Prize by the California Institute of Technology. The Wilts Prize recognizes a Ph.D. candidate for “independent research in Electrical Engineering leading to a Ph.D. degree.” The creativity of Pal’s work in “New Directions in Sparse Sampling and Estimation for Underdetermined Systems” garnered the prize.

### QU, SRIVASTAVA PART OF MULTI-UNIVERSITY MURI

Researchers at the University of Connecticut, UMD, and Rice University have won a \$7.5 million grant via an Air Force Office of Scientific Research (AFOSR) MURI to address the topic “Security Theory for Nano-Scale Devices.” The collaborative team will analyze and upgrade security protections for nano-scale computer hardware with the goal of developing Universal Security Theory

# Papamanthou, Shi Win Invention of the Year Award

The University of Maryland’s Office of Technology Commercialization (OTC) hosted the Celebration of Innovation and Partnerships (formerly Invention of the Year Awards) in April. Assistant Professor **Charalampos Papamanthou**, (ECE/UMIACS/MC2), Elaine Shi, affiliate professor in ECE, and Emil Stefanov of UC Berkley won in the Information Science Category for their research “Dynamic Proofs of Data Retrievability



PAPAMANTHOU

from Cloud Storage”. The researchers developed a dynamic proof-of-retrievability scheme that requires 300 times less bandwidth than currently available technologies. This innovative technology makes dynamic proof of retrievability of data practical and efficient and thus attractive for the industry implementation. It also gives clients of cloud storage providers assurance that their data has not been modified and that no data loss has occurred.

for the evaluation and design of nano-scale devices. **Srivastava** and **Qu** will contribute to the research by leveraging their past work and expertise in hardware security, digital watermarking and fingerprinting for VLSI design, circuit and design obfuscation, design and implementation of physical unclonable functions, 3-D integrated circuit integration and manufacture-aware design.

### ROTKOWITZ WINS NSF CAREER AWARD

Assistant Professor **Michael Rotkowitz** (ECE/ISR) is the recipient of a 2014 National Science Foundation Faculty Early Career Development (CAREER) Award for “Decentralization and Parsimony for Implementable Control of Massively Interconnected Systems.” The five-year award is worth \$400,000. Rotkowitz’s research will produce a novel synthesis of the theory and methods of parsimonious recovery, which has undergone dramatic recent developments, with both the classical results and modern advances in decentralized control. The NSF CAREER program fosters the career development of outstanding junior faculty, combining the

support of research and education of the highest quality and in the broadest sense.

### SRIVASTAVA NAMED CHAIR OF GRADUATE STUDIES

Professor **Ankur Srivastava** accepted this position for a three year term. He strives to bolster the Ph.D. mentoring program and increasing the visibility of the department’s graduate program through a blogs.

### WU NAMED EDITOR IN CHIEF OF IEEE MAGAZINE



MIN WU

Professor **Min Wu** will begin tenure as the Editor in Chief of the IEEE Signal Processing Magazine in January 2015. The magazine is received bimonthly by all members of the IEEE Signal

Processing Society. It publishes tutorial-style articles with comprehensive surveys of important theories, algorithms, tools, and applications related to signal processing. Its goal is to educate readers in new trends of signal processing and of broad community services.

## Teolis and Trappe Named 2013-14 Distinguished Alumni

In May, ECE honored two alumni for their leadership and meritorious contributions to the field of engineering at the third annual Distinguished Alumni Award presentation.

Fellow alumni, faculty, and staff gathered in the Jeong Kim Engineering Building for a luncheon to honor the awardees. This year's recipients were Doctor Carole Teolis and Professor Wade Trappe.



FROM LEFT TO RIGHT: RAMA CHELLAPPA, WADE TRAPPE, THE 2014 AWARD, JOHN BARAS, CAROLE TEOLIS

### CAROLE TEOLIS

Teolis holds a B.S. degree in mathematics and B.S. ('86), M.S. ('90), and Ph.D. ('94) degrees in electrical engineering from the University of Maryland. Her graduate work focused on controls and communications. She was honored with numerous fellowships throughout her academic career and as an outstanding student in electrical engineering.

Professor **John Baras**, her advisor, presented Teolis with the Distinguished Alumni Award. He said, "Carole is an exceptional person; a woman's role model. She does not take anything for granted [making her a curious and diligent researcher and a strong leader]."

Teolis has more than 15 years of experience in engineering research and technical management in signal processing and control systems design. She is the CTO and a founding member of TRX Systems, a high-technology Maryland company whose primary focus is combining advances in miniature electronic sensors and innovative signal processing techniques to yield low-cost/high-performance personal location-aware devices.

TRX has delivered innovative location technology and developments for the Maryland Fire and Rescue Institute, the Department of Homeland Security, the US Army, DARPA, and TSWG. In the past three years, Teolis's dedication to and contributions in this field have been recognized multiple times. In 2013,

Teolis and TRX received the TEDCO Award for Corporate Excellence, the CRTC Tech Awards Women in Tech Award, and the ACA Luis Villalobos Award for Indoor Location Innovation. In 2012, she received the CRTC Tech

Awards Innovator Award for Indoor Location Technology.

Teolis has co-authored two books and published in IEEE Transactions, Automatica, and the proceedings of various conferences. She holds two patents for applications in gas turbine engine health monitoring and has multiple patents pending for the TRX location technology.

Teolis is committed to service on boards and panels that support technology entrepreneurship, small business, commercialization of technology from universities and women in STEM fields. She serves on the University of Maryland MTECH Maryland Industrial Partnership Board.

### WADE TRAPPE

Wade Trappe earned his Ph.D. in electrical engineering in 2002, and an M.S. in 1999. He was advised by Professor **K.J. Ray Liu**, who nominated him for this award. Today, Trappe is a full professor in the Electrical and Computer Engineering Department at Rutgers University and associate director of the Wireless Information Network Laboratory (WINLAB), where he directs WINLAB's research in wireless security.


Trappe's work is widely acclaimed in the areas of security and wireless networks. Upon receipt of his award, he commented, "You must always innovate and redefine yourself. I learned to take a step beyond what was needed, to

push myself a bit further. I discovered that from the faculty [in ECE at the University of Maryland]."

This drive to innovate enabled Trappe to lead several federally funded projects in the areas of cybersecurity and communication systems. These projects involved security and privacy for sensor networks, physical layer security

for wireless systems, a security framework for cognitive radios, the development of wireless testbed resources (the ORBIT testbed), and new RFID technologies. Trappe led a DARPA initiative into validating and prototyping physical layer security mechanisms and an Army Research Office project on the theory of physical layer security. He currently leads an Army CERDEC project on cognitive radio networks and MIMO communications.

Trappe has developed several cross-layer security mechanisms for wireless networks, jamming detection, and jamming defense mechanisms for wireless networks; he has also investigated privacy-enhancing routing methods. He has published over 100 papers, including five best paper awards (two in media security, one in Internet design, one in cognitive radio systems and one in mobile computing). His papers have appeared in numerous IEEE/ACM journals and premier conferences, spanning the areas of signal processing and security.

His experience in network security and wireless spans more than 15 years and he has co-authored a popular textbook in security, *Introduction to Cryptography with Coding Theory*, as well as several notable monographs on wireless security, including "Securing Wireless Communications at the Physical Layer and Security in Emerging Wireless Systems: Lower-layer Approaches." 

# ACCOMPLISHMENTS, AWARDS & HONORS FOR ALUMNI

## ADLY APPOINTED BY PRIME MINISTER OF EGYPT

Amr Adly (Ph.D., '92) was recently appointed to the position of Executive Director of the Science and Technology Development Fund (STDF) which is the Egyptian equivalent of the NSF. He is also a fellow of the IEEE and an former advisee of Professor **Issak Mayergoysz**.

## BADER NAMED CHAIR AT GEORGIA TECH

David Bader (Ph.D., '96) was recently named Chair of Georgia Tech's School of Computational Science and Engineering (CSE). He assumed his role in July. During his time at UMD, Bader was advised by Professor **Joseph JaJa** (ECE/UMIACS) and founded and served as president of the Electrical and Computer Engineering Graduate Student Association. Since his graduation, Bader was named fellow of both IEEE and AAAS, and received a National Science Foundation (NSF) CAREER Award. Bader also received the ECE Distinguished Alumni Award in 2012. "I am amazed at the speed with which David has achieved national prominence in high performance computing and and big data analytics, and in leadership roles for major national and international professional organizations," said Joseph JaJa. "I am confident that David will lead the Georgia Tech School of Computational Science and Engineering to higher levels of national prominence."



DAVID BADER

## BLUZER HONORED BY NORTHROP GRUMMAN FOR LIFETIME ACHIEVEMENT

Alumnus Nathan Bluzer has received the Lifetime Achievement Award for Excellence in Imaging Systems from Northrop Grumman. Bluzer is a Senior Consulting Scientist at Northrop Grumman, where he works with a broad range of imaging systems, specifically in space applications.

Previously, while working for Westinghouse, he formulated innovative practical device structures to extend the performance of electronic systems. His accomplishments throughout his career include the publication of over 40 scientific papers, over 120 invention disclosures, and 31 U.S. patents. Bluzer received a doctorate in Solid State Physics and a B.S.E.E, from the University of Maryland. He was inducted to the Clark School's Innovation Hall of Fame in 1995 for pioneering work in the development of advanced microelectronic devices, including infrared, visible, and multispectral sensors. He is a fellow of the Institute for Electrical and Electronics Engineers and a lifetime member of the American Physical Society.

## BRISKMAN ELECTED TO NATIONAL ACADEMY OF ENGINEERING; WINS NABA AWARD

Alumnus and co-founder of Sirius XM Radio, Robert D. Briskman (M.S.E.E. '61) was elected to the National Academy of Engineering (NAE). Election to the NAE is among the highest professional distinctions accorded to an engineer. Briskman is honored for his achievements in satellite communications, which culminated in Sirius XM Radio. Briskman was also awarded the North American Broadcasters Association (NABA) 2014 International Achievement Award for his outstanding leadership in the broadcasting industry. The International Achievement Award is presented annually and recognizes individuals who have demonstrated extraordinary leadership in broadcasting and commitment to the organization's goals and principles.

## HAN, LIU, TRAPPE ELEVATED TO IEEE FELLOWS

ECE alumni Zhu Han, Mingyan Liu, and Wade Trappe (Ph.D. '02, MSEE, '99) were elevated to Fellow of the Institute of Electrical and Electronics Engineers. Trappe was recognized for contributions to information and communication security. Zhu Han received this honor for contributions to resource allocation and security in wireless communications. Trappe and Han were advised by Professor **K. J. Ray Liu**. Han is an Associate Professor

of Electrical and Computer Engineering at the University of Houston and Trappe is a Professor of Electrical and Computer Engineering at Rutgers University. Mingyan Liu was honored for contributions to modeling of wireless ad-hoc and sensor networks. Liu was advised by Professor **John Baras**. She is now a professor in the Electrical Engineering and Computer Science Department at the University of Michigan.

## KWASINSKI EARNS TENURE AT RIT

Alumnus Andres Kwasinski (ECE Ph.D. 2004) received tenure at the Rochester Institute of Technology and has been promoted to associate professor in the Department of Computer Engineering. Kwasinski's research interests are in digital signal processing and wireless communications and networking. His work focuses on problems and topics that are at the intersection of these two areas, particularly multimedia wireless communications, user cooperative communications, cognitive radio, multiple access to wireless networks, cross layer designs, digital signal processing algorithms and architectures, and speech and video processing for wireless communications. At Maryland, he was advised by **Nariman Farvardin** (ECE/ISR), and was a postdoctoral researcher with **Professor K.J. Ray Liu** (ECE).

## MANIKONDA NAMED PRESIDENT AND CEO OF IAI

Alumnus Vikram Manikonda (ECE Ph.D. '97) has been appointed president and chief executive officer of Intelligent Automation, Inc. (IAI), Rockville, Md. He is a former advisee of Professor **P.S. Krishnaprasad** (ECE/ISR). Manikonda joined IAI in 1999. He was named director of IAI's Distributed Intelligent Systems Group in 2001, its vice president in 2004, and president in 2008. As president, Manikonda demonstrated a track record of delivering revenue growth, leading and managing IAI's innovative research and development, and transitioning IAI's research into products in a wide range of applications of interest to government and industry. At UMD, Manikonda helped develop MDLe, a motion control language for robotics, and was manager of the Intelligent Servosystems Laboratory (ISL).



## Babadi, Hafezi, and Pal Join ECE Faculty

ECE welcomes three new assistant professors to our faculty: Behtash Babadi, Piya Pal, and Mohammad Hafezi. Babadi and Pal join the communications and signal processing faculty, and Hafezi holds a joint appointment in ECE and the Institute for Research in Electronics and Applied Physics.

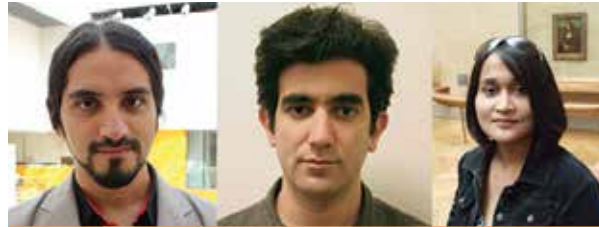
Babadi has found ECE a very welcoming and supportive community. In the spring he taught “Advanced Topics in Signal Processing: Neural Signal Processing,” a high-enrollment elective graduate course that included students from ECE, biology, and the Neuroscience and Cognitive Science Program. “The course outcomes were really impressive, and have resulted in two peer-reviewed conference submissions,” Babadi said. He supervises a graduate student, co-advises two others, and is planning a Capstone Design course for undergraduates.

Babadi’s research interests include statistical and adaptive signal processing, biological signal processing, compressed sensing, and systems neuroscience, but have evolved since his arrival. He is collaborating with ECE professors Shihab Shamma and Jonathan Simon, Luiz Pessoa from Psychology, and Cynthia Moss from Johns Hopkins University. “These collaboration opportunities are unique to UMD and the D.C. metropolitan area; I look forward to a productive and enjoyable research and teaching career in this unique environment,” he said.

Babadi received his Ph.D. and M.S. degrees in Engineering Sciences from Harvard University, advised by Prof. Vahid Tarokh, in 2011 and 2008. Babadi was a post-doctoral fellow at the Department of Brain and Cognitive Sciences at Massachusetts Institute of Technology as well as the Department of Anesthesia, Critical Care and Pain Medicine at Massachusetts General Hospital, mentored by Professor Emery N. Brown.

Hafezi’s research interests are

in quantum simulation, optical communication and computation, quantum hybrid systems, and optomechanics. Recent research interests



BEHTASH BABADI, MOHAMMAD HAFEZI, PIYA PAL

include the quantum mechanical effects of topological phenomenon (how parts of a system connect). In a Quick Study for Physics Today, Hafezi discusses a circular linked necklace which “can be deformed into an oval or a rectangle without changing the topology, since the links remain connected in the same way. But the necklace can only be made into the topologically distinct straight line if it is cut or its clasp is opened.” The quantum Hall effect is similar. A free particle in the bulk of a 2D material (away from the edges) can complete its orbit, staying essentially in place and not contributing to conduction. But particles closer to the edge cannot complete their orbits and skip along the edge, creating a charge. He discovered this also holds true for photons. The real-world applications of this include development of robust optical devices on-chip and increasing the density of information that can be carried along optical fibers.

Hafezi will join the Joint Quantum Institute (JQI) as a fellow. He received his Ph.D. in Physics from Harvard University in 2009, and has since been working at JQI as a postdoctoral researcher. This fall, Hafezi will teach Electromagnetic Theory and meet with students interested in joining his research team.

Here since the spring, Pal credits her colleagues and helpful ECE staff with helping her settle in. “The department and school help young assistant professors and provide resources for research and teaching to kick start our

careers. My department mentors have given valuable feedback during the graduate admission cycle, and directed me to resources for female faculty.

Dr. Chellappa always helps address questions and a thriving community of young assistant professors in the department is a good support system,” she said.

In the spring, Pal enjoyed teaching an undergraduate elective course, Digital Signal Processing, and will teach a graduate core course in the fall. She is also building her research team—she brought one student on in the spring and is accepting a Ph.D. student for the fall.

Pal received her Ph.D. in Electrical Engineering from California Institute of Technology (Caltech). While there, she was advised by Professor P. P. Vaidyanathan. She focused on developing structured sampling techniques by exploiting the statistical properties of signals. She invented two new sparse sampling techniques, viz. nested and coprime sampling for efficient sub-Nyquist sampling of wide-sense stationary (WSS) signals. She won the Wilts Prize for Outstanding Ph.D. Thesis in Electrical Engineering at Caltech.

As a student, Pal’s research focused on statistical signal processing techniques for array processing. Today she also is interested in High Dimensional Signal Processing and Statistical Learning and aims to develop sampling, reconstruction and compression limits of high dimensional objects with a low dimensional structure. This new research is closely related to Big Data Processing. She hopes to collaborate with UMIACS, as well as the vision, learning and data mining groups that regularly work with large dimensional data. UMD’s proximity to defense labs also will provide opportunities to support her work on sensor array processing for smart wireless and tracking devices. ☺

**ZHU SELECTED AS 2013-14 IEEE PES SCHOLARSHIP PLUS SCHOLAR**

Junior **Emmeline Zhu** received a \$2,000 IEEE scholarship as part of the IEEE Power and Energy Society (PES) Scholarship Plus Initiative. Department Chair Rama Chellappa presented the award. Zhu was one of a select group of students from 117 U.S. and Canadian universities who received an IEEE PES Scholarship.



CHELLAPPA AND ZHU

The award recognizes undergraduate students in electrical and computer engineering with high GPAs and who are active in extracurricular activities and are committed to exploring the power and energy field.

**OZEL TAKES SECOND ON DEAN'S RESEARCH AWARDS**

**Omur Ozel's** Doctoral research, "Coding and Scheduling in Energy Harvesting Communication Systems," was awarded second place in the Clark School of Engineering 2014 Dean's Doctoral and Master's Student Research Awards. The competition recognizes distinguished Clark School student researchers with the purpose of propelling their careers and demonstrating the value of high quality engineering research. His research focuses on determining information theoretic capacity limits of communications systems with energy harvesting transmitters. It determines ultimate channel capacities as well as explicit coding and transmission schemes for such systems. Judges were impressed by Ozel's novel contributions to information theory. His work has the potential to significantly impact future sensor networks. He is advised by Professor **Sennur Ulukus**.

**CHOI WINS GOLD AT SAMSUNG HUMANTECH PAPER AWARDS**

**Jongyun Choi**, a Ph.D. candidate, won Gold Prize in Signal Processing at the 20th Annual Samsung

Humantech Paper Awards. Choi's research focused on a classification generalization technique used for object and image recognition problems in computer vision. He is associated with UMIACS and the Center for Automation Research and is advised by Professor **Larry Davis** (ECE/CS). This annual paper competition held by Samsung Electronics Co., Ltd. accepts submissions in ten fields. More than 200 papers are submitted per field; yet there are few prizes: 1 gold, 2 silver, 3 bronze, and 2 honor prizes.

**TWO ECE STUDENTS WIN KULKARNI FELLOWSHIPS**

**Anup Menon** and **Krishna Puvvada**, Ph.D. students, were awarded the 2014 Kulkarni Foundation Summer Research Fellowship, which supports UMD doctoral students who are graduates of the Indian Institute of Technology (IIT). Menon feels receiving the Kulkarni fellowship is a great morale boost, and is very grateful for recognition of his work. Menon (MS Systems and Control Engineering, '08, IIT Bombay) will graduate from UMD in 2014. He is a Ph.D. candidate under Professor **John Baras**. Menon's research explores maximizing power production of wind farms. Due to aerodynamic interactions between wind turbines, each maximizing its individual power production does

not lead to farm-level optimal power capture and there are no accurate models for aerodynamic interactions. Menon has been developing provably correct model-free distributed algorithms that help solve such problems. These algorithms help maximize total power production by having the turbines iterate over their individual set-points on-line. "The Kulkarni fellowship will help me test these algorithms on higher-fidelity models of wind farms, including building such simulation models," Menon said. Puvvada (IIT, Kharagpur) entered the Ph.D. program in 2010 and will soon advance to candidacy under the direction of Professor **Jonathan Simon**. His research seeks to solve the problems of auditory scene analysis. He is interested in how the brain represents and processes complex auditory signals. Practically, it may lead to the design of better hearing technologies. These funds will allow Puvvada to study abnormalities in steady state responses using auditory stimuli in Schizophrenia patients. Since auditory hallucinations are hallmarks of this disease, biomarkers (which may point to erroneous information processing/segregation in the auditory system) could be used as a diagnostic tool. Ashok V. Kulkarni (Ph.D., CS '76) and the Kulkarni Foundation established the fellowship in January 2013, and award it to students to help them complete their degree. ☺

**Subramanian Wins All-S.T.A.R. Fellowship**

**Sowmya Subramanian**

is one of 16 winners of the university-wide Graduate All-S.T.A.R. Fellowships, awarded by the University of Maryland Graduate School (S.T.A.R. stands for scholarship, teaching, administration and research). This competitive fellowship honors graduate students who are both outstanding scholars and graduate assistants.



SOWMYA SUBRAMANIAN

Subramanian is a research assistant and a R.W. Deutsch fellow advised by Professor **Reza Ghodssi** in the MEMS Sensors and Actuators Lab (MSAL) where she focuses on bacterial biofilm characterization, detection, and treatment. She is also a Future Faculty Fellow (FFF)

and desires a career in academia. Subramanian won the Best Student Poster Award at the 2014 Mid-Atlantic Micro/Nano Alliance Symposium and is an active member of the Graduate Student Government (GSG) and the Women in Electrical Engineering (WECE).

Her doctoral dissertation will focus on developing an integrated system for biofilm detection and treatment using Lab-on-a-Chip technology. She is also working to understand the effects of using small communication-hindering molecules, or analogs, in combination with electric fields as a potential treatment for biofilms. This multi-disciplinary project includes components from electrical engineering, MEMS, biology, biotechnology and chemistry.



Andrew Berkovich, a fourth year ECE PhD student, was named the new president of the Electrical and Computer Engineering Graduate Student Association (ECEGSA) for the 2014-2015 academic year. Andrew is advised by Prof. Pamela Abshire in the field of microelectronics and his research focuses on developing biologically-inspired low-light



vision systems. He received his Bachelor of Science with Honors in Electrical Engineering from the University of Maryland, College Park in 2011. He previously served on the ECEGSA board during the 2013-2014 academic year and is currently serving on the ECE Department Council. Andrew is an A. James Clark Future Faculty Fellow and was named a Distinguished Teaching Assistant by the

Center for Teaching Excellence in 2013. He also received the Litton Industries Graduate Fellowship in Engineering Education and the Graduate Student Summer Research Fellowship in 2014. ☐

## ECE STUDENTS PLAY MAJOR ROLE IN FIRST UMD HACKATHON

The University of Maryland hosted Bitcamp, the university's first Major League Hackathon, on April 4-6, in Cole Field House. Over 500 college students from across the country attended the 36-hour summit, working in teams to create new apps, games, and programs.

A hackathon is an event, typically lasting 24 to 36 hours, where students work in teams to produce inventive hardware and applications for computers, mobile devices or the Web—otherwise known as “hacks.” Teams then showcase their creation to a team of judges and other participants. Bitcamp is one of 37 official Major League Hacking events taking place this year.

However, Bitcamp isn't your typical hackathon. Organized completely by undergraduate students, Bitcamp focused less on competition and more on collaboration. For this reason, its organizers created a fun environment where students could meet each other, make contacts, and discuss problems and solutions. Teams roasted marshmallows, constructed towering structures with building blocks, and tried out gadgets like Google Glass and Oculus Rift while developing their projects. They also had the opportunity to network with representatives from major companies, including former Clark School student Brendan Iribe, CEO of Oculus VR, a company developing wearable immersive virtual reality technology that was recently sold to Facebook for \$2B.

Submissions were featured online and included a myriad innovative, interdisciplinary hacks. These included an application that generates mood-based playlists based on the sentiment of your tweets, a virtual business card wallet, and a website that aggregates news articles and posts them onto a world map. Teams were judged and awarded prizes by Bitcamp sponsors, such as Booz Allen Hamilton, Clarabridge, and Microsoft.

Though not every team completed a project or won a prize, they all walked away with useful skills, positive experiences, and new friends, making the goal of Bitcamp a major success. ☐

## LOOKING BACK ON 2013 - 2014 EVENTS



Some graduating seniors gather with ECE faculty and their families the evening before commencement.

Undergraduate families join us for a “Back to ECE” night featuring lab tours and ice cream from the Dairy. The event coincided with Parents' Weekend.



ECE undergraduates celebrate at the May 2014 Commencement Reception held by the Clark School for graduates and their families.





*Your education in*  
**ELECTRICAL & COMPUTER ENGINEERING**  
*led to success.*  
*Be a foundation for future engineers.*

Jim Cantor is a graduate of the University of Maryland, first as an undergraduate seeking a Bachelor's of Science in Mathematics ('81), then as a graduate student studying to complete his Master of Science in Electrical Engineering ('84). Today, Cantor is the National Security Sector Chief Engineering for Leidos, a spin-off of SAIC.

Regarding his time as a student in the Department of Electrical and Computer Engineering (ECE), Cantor says, "My experience as a student in ECE was truly transformational. I am deeply grateful for the opportunity to learn from many exceptional professors and colleagues. Through my courses, I developed a sound engineering and mathematical foundation that has enabled me to be successful in two highly technical organizations, SAIC and Leidos. More importantly though, I was challenged, stretched and pushed out of my comfort-zone which gave me the confidence to challenge myself."

*Cantor remains closely involved with the department. "I have the honor of being on the ECE Advisory Board which enables me to participate in addressing ECE's most important issues and challenges," says Cantor. He is also Leidos' University Liaison to UMD. In that role, he is able to work directly with ECE to establish joint research opportunities and support key initiatives of the department.*

*"Today, ECE is stronger than ever. When I attended, the department began a virtuous cycle-through expanding areas of research that, in turn, enabled it to attract funding and a number of outstanding young professors. The department began to rapidly grow in capability and stature and has continued with that trajectory; today it is recognized as one of the great research departments in the country."*

*Cantor chooses to personally contribute to the Chair's Discretionary Fund. "I am fortunate to be able to personally contribute financially to support young engineers. I give so that they can take advantage of the same opportunities I had," he says. Cantor recognizes the importance of 'giving back', but gives because "it is a matter of national security that the country maintains a strong high-tech research and manufacturing capability. I believe this can only be accomplished through providing world-class education and training young engineers through our university system. ECE is doing that and it's critical to ensure it is sustainable," Cantor said.*



To learn how you can make a charitable contribution today and have a measurable impact on the future of the Electrical & Computer Engineering Department, or to explore other options, contact Amanda Stein, director of external relations.

steina@umd.edu | 301.405.8189



JIM CANTOR AT AN ECE STUDENT EVENT (FIRST ROW, 3rd FROM LEFT)



# A. JAMES CLARK

SCHOOL OF ENGINEERING

Department of Electrical and Computer Engineering  
2455 A.V. Williams Building  
University of Maryland  
College Park, MD 20742

Nonprofit Org.  
U.S. Postage  
PAID  
Permit No. 9  
College Park, MD

## ECE EXPRESSES SINCERE THANKS FOR THE FOLLOWING CORPORATE AFFILIATES WHO WILL SUPPORT OUR STUDENTS AND RESEARCH IN 2014-2015:



Booz | Allen | Hamilton



## CORPORATE AFFILIATES SPOTLIGHT: TEXAS INSTRUMENTS

Texas Instruments (TI) has the distinction of being the first ECE Corporate Affiliate. Their support of the Electrical and Computer Engineering department began in 2007, although their relationship is long-standing. In 2014-15, Texas Instruments will support a graduate fellowship for James Edward, a Ph.D. student working with Professor Uzi Vishkin, for the second year. Texas Instruments will also sponsor three Undergraduate Research Fellows for the upcoming academic year. These students will work on projects such as Parallel Computing, Digitally Controlled Systems, and 5-10MHz Phase Locked Loop. ECE also appreciates the support of Texas Instruments in their sponsorship of our second "back to school" event for ECE students and their families, held as part of the University's Family Weekend.

Equipment provided by Texas Instruments is also the cornerstone of our Digital Signal Processing lab. The TMS320C digital signal processing card is the key piece of equipment

used in this upper level undergraduate course. We continually benefit from the generosity of our corporate affiliate, as they are always willing to provide updated technology when needed.

ECE graduates and alumni are frequently hired by Texas Instruments. The company ranked second in number of graduates hired from the department in the 2013-14 academic year. To recognize the value of this relationship and the opportunities provided to our alumni, Rama Chellappa, department chair, and Mel Gomez, associate chair of undergraduate studies, recently visited TI headquarters in Dallas. There they met with a number of former ECE students and a significant alumnus, Ray Upton (BSEE, '95), vice president, Sales and Applications, Americas. Chellappa, Gomez, and some TI folks enjoyed pizza cooked in Upton's backyard, especially the dessert pizzas with peanut butter and chocolate sauce; and brown sugar and bananas!

It is our sincere hope that this fruitful partnership continues for many years to come. Learn more at [ti.com/students](http://ti.com/students).

**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: Carrie Hilmer, ECE Department, 2455 A.V. Williams Building, College Park, MD, 20742 or [chilmer@umd.edu](mailto:chilmer@umd.edu). Visit our web site at: [www.ece.umd.edu](http://www.ece.umd.edu)

Department Chair: Dr. Rama Chellappa

Editor: Carrie Hilmer

Photography: J. Consoli, C. Hilmer, J. Molina, A. Santos, Rafterman Photography, Ellen Lau