

Expanding Global Learning Opportunities for ECE Students

During a 2004 sabbatical trip to China, Yuan Zheng saw an opportunity to help students at The Ohio State University gain the international experience needed to stay competitive in today's global marketplace.

Since then Zheng, a professor of electrical and computer engineering, has led the department's efforts to establish a cooperative degree and student exchange program with the School of Electronic, Information and Electrical Engineering at Shanghai Jiao Tong University (SJTU).

"I wanted to make use of the relationships that I established with the SJTU administrators and faculty to benefit the university and Ohio State students," said Zheng.

Launched in 2011, the program enables exceptional undergraduate students at both SJTU and Ohio State to gain a global educational and professional experience by studying at the partner university. In 2012, Ohio State hosted 20 SJTU senior students during the fall semester. The program also enables interested Chinese students to return to Ohio after graduation to obtain a master's degree. Twelve of the original 14 participants from 2011 are currently pursuing a master's, while one student has enrolled in the ECE PhD program.



ECE students, left to right, Kevin Stewart, Zach Imm and Shivani Patel, along with Imm's father, Chuck, take a break from their studies in China to visit the Great Wall.

"As the number three university in China, Shanghai Jiao Tong University produces top quality undergraduates," said Zheng. "The SJTU students who study here become an excellent pool of candidates for graduate studies at Ohio State."

The student exchange program also allows Ohio State electrical and computer engineering undergraduates to study at SJTU for one semester, an opportunity that three ECE students took advantage of this year.

"To my knowledge, this is the first group of ECE students to ever study abroad for an extended period of time," said Robert Lee, chair and professor of electrical and computer engineering. "We believe this program will be a role model for future international collaborations."

SJTU teaches a variety of courses in English each term, removing language as a barrier for engineering students who wish to study abroad in China.

"I have always been interested in studying abroad and was really excited to find out that this program actually allows students to take engineering courses abroad and receive credit for them at Ohio State," said Shivani Patel, a third year electrical and computer engineering major who studied at SJTU in spring 2013. "I highly recommend the program to other engineers because of how much you can gain from this once in a life-time experience."

In addition to coursework, Ohio State students are pursuing research projects with SJTU faculty and internships with companies in Shanghai.

"I am working for Chrysler in Shanghai to assess networks and write code to automate tests on production vehicles," said Kevin Stewart, a second-year electrical and computer engineering major. "The Chinese work environment is a little different from that of the United States and I feel that I will be a better professional by learning from them."

Next, Zheng aims to expand the SJTU partnership to include cooperative research opportunities to allow faculty and students from both countries to work on fundamental research on problems of common interest to both the U.S. and Chinese governments, such as global warming, energy issues, traffic issues, etc. •

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From the Chair



Lee

The first year under semesters has come and gone, and overall the transition has been successful. There were some unexpected hiccups as enrollment in certain classes was much higher than expected. Faculty members were very willing to be flexible in the course assignments and we were able to open new sections to accommodate the higher student enrollments.

Our foray into new learning techniques for our sophomore year was also successful. Many students appeared to be uncertain about the flipped classroom, where students watch the lectures on video as homework and then meet in small classes of approximately 25 students to do problems and have their questions answered by the instructor.

Based on enrollment choices for the upcoming year, however, it is clear the students prefer the flipped classroom over the traditional approach to teaching.

One of our major ongoing goals is to increase the number of women faculty and students within the department. Nationally, the percentage of women faculty and students in electrical and computer engineering programs is among the lowest of any of the science and engineering departments, with numbers in the single digits at most institutions. In fact, many of you may remember that Dreese Laboratories was originally built with no women's restrooms.

This year we achieved a milestone for both women faculty and students. With the hiring of Professors Lori Dalton and Yujie Chi, the percentage of women faculty has now reached double digits for the first time in the history of the ECE department. Two new women faculty will be joining us for the 2013-2014 academic year, bringing the total number of female faculty to seven and placing us among the highest percentage of female electrical and computer engineering faculty members in the nation.

The percentage of women enrollment in the undergraduate program has also grown in the past five years from 7.4 percent in 2007 to 10.8 percent in 2012. Underrepresented minority enrollment (African American, Hispanic, and Native Americans) has also continued to increase, from 5.9 percent in 2007 to 8.1 percent in 2012.

The department graduate program ranking in US News & World Report has continued to climb over the past seven years. We improved one position this year, to 18th out of 173 programs. This ranking is the highest we have achieved in the past 20 years. I feel our ranking is impressive since most of the public universities of comparable rank have much larger faculty sizes.

In closing, I wanted to share that I plan to step down as chair in August 2014. Professor Joel Johnson, a 17-year veteran faculty member in the department, has been selected as the chair designate and will take over at that time. I am spending this next year to help him transition into the role. I am confident that Professor Johnson is the right choice and will be an excellent leader for the future of our great Department of Electrical and Computer Engineering. Go Bucks! •

ECE Staff

A team of 21 staff supports the Department of Electrical and Computer Engineering, including:

front row, from left, Bill Thalgott, Soyung Carpenter, Don Gibb, Jeri McMichael, Heather Miller, Stephanie Muldrow, Mark Brenner, Jill Mobley, Edwin Lim, back row, from left, Patricia Toothman, Beth Bucher, Susan Noble, Wendy Flores, Rachael Habash, Carol Duhigg, Ray Feast, Bobby Srivastava, and Vincent Juodvalkis. Not pictured: Aaron Aufderheide, Alissa Kasmer and Lindsey Margaroli.



KEVIN FITZSIMONS

Bringing Robots Up to Speed for Disaster Relief

When responding to a natural or man-made disaster means putting human lives at grave risk—as during the Fukushima Daiichi nuclear disaster—wouldn't it be ideal to send in the first-responder robots instead?

The Ohio State University is part of a 10-school collaboration, led by Drexel University, working to advance robotics technology for disaster relief as part of the U.S. Defense Advanced Research Projects Agency Robotics Challenge. Teams from academia, industry and the private sector will attempt to design and deploy a robot capable of disaster response in radioactive or bio-contaminated areas. The robot must drive vehicles, navigate human-centered environments, use tools and manipulate equipment.

Yuan Zheng, professor of electrical and computer engineering, leads Ohio State's efforts in the challenge.

Researchers from each of the 10 partner schools are working to tackle specific aspects of the challenge, which is broken into eight events related to disaster mitigation. Robots must mount, drive and dismount a vehicle; travel across rubble; remove debris; open a door, climb a ladder; use a tool to break through a concrete wall, locate and shut off a leaky valve; and remove and replace a pump.

According to Zheng, having a robot capable of accomplishing even one of these tasks would be a giant leap forward from the current state-of-the-art in robotics technology.

"A robot can't do any of these tasks today. Just getting a robot to climb into a vehicle is very difficult, almost impossible, to perform," he said.

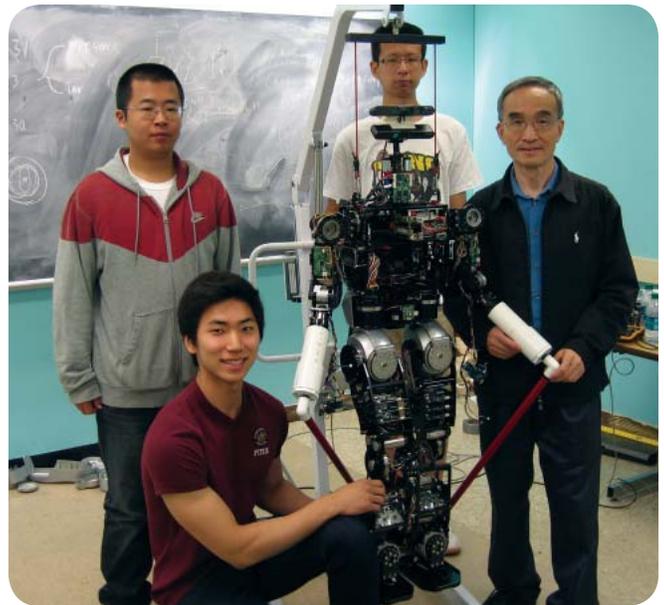
The Ohio State team is responsible for equipping the robot to travel across rubble, which might be anything from rocks to large piles of debris. The group developed what they consider to be an innovative gait, inspired by the poles skiers use to aid in balance.

"We developed an innovative update, called a "ski type" gait, which adds two canes to the robot to increase its support area and stability," Zheng said. "Using this approach, if the surface becomes sloped or uneven the robot still has some margin to maintain stability. It's much better than a two-legged robot."

The removable canes increase the robot's stability without making permanent changes to its structure, which could affect its performance in other challenge events.

The Drexel-led group, dubbed the DRC-HUBO team, is one of seven selected for Track A funding by DARPA and must develop their own robot and operation software. The team derives its name from the HUBO humanoid robots they will employ for the challenge. The robots were developed by another challenge partner, Korea Advanced Institute for Science and Technology, and funded by an earlier collaboration of universities, which is also led by Drexel University and includes Ohio State. That collaboration resulted in a \$6 million National Science Foundation grant to develop a common platform (HUBO+) for humanoid robotics research. The team is also using HUBO+ in the challenge.

The team passed the first critical design review in June, a virtual competition that tested the teams' concepts via simulation. In December 2013, the conceptual design and simulation phase will culminate with a live competition to test the robots' ability to complete the eight events. DARPA will then select teams to continue into Phase 2 for another head-to-head competition 12-months later.



Yuan Zheng (right) and students (left to right) Hongfei Wang, Taegoo Kim and Shimeng Li show their innovative cane design to increase HUBO's stability for crossing rough terrain.

Another prerequisite to engineering robots capable of responding to nuclear disasters is making them able to withstand high levels of radiation. Zheng is working with Lei (Raymond) Cao, assistant professor of nuclear engineering, on a separate \$450,000 Department of Defense Threat Reduction Agency project to study the radiation sensitivity and failure mechanisms of robots working in harsh radiation environments.

"We are focusing on three fundamental components of robots—the battery, the magnet in the motor and the harmonic drive—under radiation," said Zheng. "These studies have never been performed."

The renewed interest in humanoid robotics has engaged Zheng—who was one of the first U.S. researchers working in humanoid robotics and developed the first humanoid in 1986—into the real-world application of the research area he embarked on more than 30 years ago.

"Robots are just cool and are always very challenging. Once you solve one problem, there is always another one to solve." •

Buckeyes Claim Top Collegiate Spot in Electric Motorcycle Races



Left: 2013 Buckeye Current Motorcycle Team. Right: Rider Rob Barber prepares for practice laps at Jurby Field on the Isle of Man prior to the TT Zero race.

The Ohio State University College of Engineering's Buckeye Current electric motorcycle team—along with UK native and world-renowned rider Rob “The Bullet” Barber—finished third in their first-ever appearance at the world-famous Isle of Man Tourist Trophy (TT) races. The only U.S. collegiate team to compete in the TT Zero, Buckeye Current steered to a podium finish with an average speed of 90.4 mph, besting both professional and collegiate competitors.

“This is a fantastic accomplishment for a first-time, student-run team and places the Buckeye Current as the number one university team in electric motorcycle races,” said Giorgio Rizzoni, director of Ohio State’s Center for Automotive Research, where the team is based.

First and second places went to MotoCzysz and Mugen, professional teams with multi-million dollar budgets. Ohio State’s student-led team designed and built their electric motorcycle—the “RW-2”—with approximately \$50,000.

“We didn’t imagine how incredible this place was – the atmosphere, the racing, the challenge,” said Aaron Bonnell-Kangas, Buckeye Current team member and an electrical and computer engineering major. “The total development time of our bike was just over nine months, from conception to completion, with a budget at a fraction of the professional teams that bested us.

Yet we became only the second collegiate team to earn a podium finish, and are the only one to break 90 mph on an electric machine around the Mountain Course.”

Getting to the race marked the accomplishment of a three-year team goal to compete in an international or national race and enables the students to apply their education in a real-world setting. In order to prepare for the Isle of Man, electrical engineers, mechanical engineers and other students had to first design and build the motorcycle, named the RW-2. A feature aspect of the second-generation vehicle is an innovative student-created electronic management system governing the rechargeable battery packs that “fuel” the vehicle.

Although the Isle of Man TT Zero was Buckeye Current’s first race, the team previously set an East Coast Timing Association (ECTA) speed record for electric motorcycles on July 8, 2012, with a speed of 144.352 mph. They earned the title of fastest collegiate motorcycle with their first vehicle, RW-1.

Competing in the race was more than an adrenaline rush for engineering students, it provides a unique opportunity to solve real engineering challenges.

“Being enveloped in a professional race atmosphere is a learning experience like no other,” said Julia Cline, Buckeye Current co-team leader and an electrical and computer engineering major.

“The Isle of Man TT was brimming with the highest caliber riders and their staff. The environment forces additional constraints upon us and demands a much higher level of problem solving and increased sense of urgency. None of this is what you’d learn in a typical campus classroom.”

The team is already planning improvements and modifications for their next vehicle in order to increase speed and decrease lap times at next year’s TT Zero. Recruiting the next crop of talented team members is also vital.

“We have a few students graduating, but there are always more developing leaders at the university to train and teach,” adds Cline. “Together, we know we can continue to do even better in the future.”

Buckeye Current’s largest sponsors are the Honda/OSU Partnership, a bilateral collaboration between The Ohio State University and Honda of America Manufacturing that supports initiatives in education, research and public service, and Advanced Electronics Energy. The team also enjoys support from RRW Engineering, Aaron Equipment Company and Commercial Vehicle Group, Inc., among many others.

The team’s next competition is August 18 at the TTXGP in Indianapolis, Ind. •

Follow Buckeye Current at current.osu.edu and on Twitter at twitter.com/BuckeyeCurrent

Creating Theories That Withstand the Test of Time

Prabhakar Pathak, professor emeritus of electrical and computer engineering, came to The Ohio State University as a graduate student to study at the top program in electromagnetics.

After earning his master's in 1970 and a PhD in 1973, both from Ohio State and in electrical engineering, he became a professor in that same top program. Although he was appointed professor emeritus in 2007, Pathak continues to conduct research in electromagnetic theory and antennas at the world-renowned ElectroScience Laboratory.

It's a career path that might have surprised his younger self, given that he originally wanted to become a nuclear physicist.

"In high school I got interested in nuclear physics. That doesn't mean that I knew much about it, but I read a lot of popular books on atomic physics and so on," said Pathak. "So in college I studied physics with a math minor."

A winding road led him from a fascination with nuclear reactors for producing power, to nuclear engineering, to electrical engineering.

"I was ready to enroll in a nuclear engineering bachelor's program, but I was also fascinated by transistors that had gained popularity at the same time, in the early 60s. It seemed to me that electrical/electronic engineering was not far from physics, so I decided at the last minute to change to electrical engineering," he said.

Pathak enrolled in the undergraduate electrical engineering degree program at Louisiana State University where one of his professors, noted electromagnetics (EM) expert Chalmers Butler, inspired him to pursue graduate study in EM.

"Butler showed me how EM is one area where physics and mathematics can be combined in a beautiful way to solve problems of engineering interest and I really got excited with that," Pathak said.



Pathak

Coming to Ohio State would also lead Pathak to his main research area.

"I came at the time when Professors Bob Kouyoumjian, Leon Peters, Roger Rudduck and others were working on Keller's Geometrical Theory of Diffraction and realized that we had to fix it for engineering applications. We needed to patch it up, because it had some singularities," said Pathak. "I came at the right time to the right place to work with the right person, Bob Kouyoumjian."

From that work, Pathak went on to become the co-developer with Kouyoumjian of the highly-successful uniform geometrical theory of diffraction (UTD), which is widely used to solve electrically large antenna radiation and radar scattering problems.

Developed in the 1970s and 1980s, this technique allowed for an accurate analysis of antennas and radar systems when mounted on large airborne and ground vehicles. The method not only added a unique understanding of the phenomena associated with these problems, but more importantly, it provided analysis and design tools that were sufficiently reliable to avoid repeated measurements.

The success of the method allowed many other Ohio State faculty and researchers to participate in some of these developments and, in particular, transitioning it to commercial software tools. The UTD impacted several 20th century technologies, including stealth aircraft, wireless propagation and connectivity, antenna design, and indoor measurement techniques.

"While researchers at other institutions were working in the same area, Ohio State's ray theories have withstood the test of time," said Pathak. "They've been the most practical and have had the most use. Our UTD solutions covered a much wider class of diffraction phenomena."

Pathak received the 2013 IEEE Antennas and Propagation Society Distinguished Achievement Award, their highest honor, in recognition of his work in "introducing and establishing the Uniform Theory of Diffraction (UTD) as a computational tool in Electromagnetics (EM) and for innovative solutions to EM antenna/scattering problems."

Four other Ohio State alumni or former faculty are also recipients of the IEEE APS Distinguished Achievement Award, including John Kraus (1985, 2003); Roger F. Harrington (1989), Robert G. Kouyoumjian (1999) and Constantine Balanis (2012).

Pathak also received the IEEE Third Millennium Medal from the Antennas and Propagation Society in 2000.

The very thing that brought Pathak to Ohio State—the opportunity to be part of a leading electromagnetics program—is part of what compels him to remain active and engaged in conducting research at the ElectroScience Laboratory.

"Being on the forefront of things and working at a place that's known for being on the forefront of a lot of areas in electromagnetics is quite exciting," he said. "It's kind of contagious, working with the great people here." •

ECE Welcomes New Faculty



Lisa Fiorentini, *Assistant Professor of Practice*

Doctoral Institution: The Ohio State University

Lisa Fiorentini has been conducting research at The Ohio State University Center for Automotive Research since 2010, mostly recently as a senior research associate. Her research spans the field of control and system theory with emphasis on nonlinear systems, robust and adaptive control, and applications in aerospace and automotive engineering. Fiorentini earned a PhD in electrical and computer engineering from The Ohio State University in 2010.



Liang Guo, *Assistant Professor*

Doctoral Institution: Georgia Institute of Technology

Liang Guo joins Ohio State with a joint role in electrical and computer engineering, and neuroscience. He conducts research in neural interfaces, neural prosthetics, biomedical microdevices and biological circuits engineering. Guo earned a PhD in bioengineering from the Georgia Institute of Technology in May 2011. He was formerly a postdoctoral associate at the Massachusetts Institute of Technology.



Wladimiro Villarroel, *Assistant Professor of Practice*

Doctoral Institution: The Ohio State University

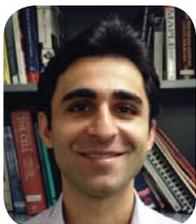
Wladimiro Villarroel joins the ECE department as an assistant professor of practice. He has more than 15 years of industry experience including ten years at AGC Automotive Americas where he was division manager for fundamental technologies. There Villarroel managed research and development programs and innovation activities in the U.S. for the world's largest automotive glass supplier related to antenna, glass-forming simulation, acoustics, and solar technologies. He holds a PhD in electrical engineering from The Ohio State University, a JD from the Thomas M. Cooley Law School in Ann Arbor, MI, and an MBA from Cleveland State University.



Jiankang Wang, *Assistant Professor*

Doctoral Institution: Massachusetts Institute of Technology

Jiankang Wang joins Ohio State with a joint role in electrical and computer engineering, and integrated systems engineering. She conducts research in power system operation and planning, electricity markets, reconfiguration, demand side management, distributed generation, and renewable energy. Wang received a PhD in electrical engineering and computer science from MIT in 2013.



Mohammadmahdi Rezaei Yousefi, *Research Assistant Professor*

Doctoral Institution: Texas A&M University

Mohammadmahdi Rezaei Yousefi joins Ohio State as a research assistant professor. Yousefi received a PhD in electrical engineering from Texas A&M University in 2013. He conducts research in genomic signal processing, optimal control of gene regulatory networks, cancer therapy, systems biology, pattern recognition and small-sample classification.

Margaroli Leads ECE Advancement

Lindsey Margaroli, senior director of development, has joined ECE to lead the department's advancement efforts. She has 11 years of experience at The Ohio State University, including seven and one half years with the College of Engineering. Most recently, Margaroli served as interim director of advancement before helping recruit Matt McNair, the current chief advancement officer for the College of Engineering, from the University of Nebraska. Although she grew up in New York and graduated with a bachelor's degree from Middlebury College, in Vermont, Margaroli said she's now "100% pure Buckeye." She is the proud parent of two current Ohio State students. •



from left: Lindsey Margaroli displays Buckeye pride with Matt McNair, Jessica Schmitt and Dean David Williams at the Engineering Development Forum

Getting to Know the Faculty: Lee Potter

Lee Potter is a professor of electrical and computer engineering

Tell us about your current research.

I am currently applying signal processing techniques to sensing problems in radar, cardiac magnetic resonance imaging, and electron paramagnetic resonance imaging. The work is in collaboration with Wright-Patterson Air Force Base and the Ohio State Davis Heart and Lung Research Institute. Perhaps surprisingly, we find great similarities and synergy in the technical challenges present among these applications. Our group's approach combines elements of Bayesian statistical inference, modeling of the sensor physics, inverse problems, image processing and numerical optimization.



Potter

While we do sometimes develop sensing instrumentation, our impact is more typically one of making better use of data provided by existing systems. For example, a new biomedical device being prototyped at Ohio State for neonatal care is able to measure tissue health in 40 seconds instead of the 40 minutes required by existing techniques. This is due to efficient use of the measured data, as guided by a first-principles approach to the processing.

What made you decide to become an engineer/professor?

My first job out of high school was at a municipal landfill. I decided I should stay in school, which I subsequently did – for not one, but three degrees.

I find an elegant magic in the use of mathematics to describe physical behavior. Engineering gives us the opportunity to not only model behaviors, but also design and implement them.

While an undergraduate student at Vanderbilt University I was invited to lead a calculus recitation. I very much enjoyed the teaching experience, and it led to my choice to stay in academia.

What do you like best about teaching and/or working with students?

I enjoy sharing in moments of revelation and insight. The variety of learning styles we face is fun as well, as it demands the presentation of multiple interpretations of the concepts we teach. I also enjoy the process of synthesizing many, and potentially complex, ideas into a simple and compelling narrative. •

In Memoriam

Wendell H. Cornet Jr., PhD EE '58, professor emeritus of electrical engineering, passed away on November 18, 2012. He was 89.



Cornet was an active member of the ECE faculty for 34 years. After retiring from teaching, he helped found and was president of Softcad Electronics Company. He received the Ralph L. Boyer Award for meritorious achievement in academic endeavors and was a Schmitt scholar to the National Engineering Consortium.

Cornet was coauthor of several technical papers and text books and a contributing writer to several professional journals

He was also a veteran of WWII. •

Krishnamurthy Retires After 26 Years

As Shok Krishnamurthy has retired after 26 years of service to The Ohio State University.

In addition to his role as a professor, Krishnamurthy was senior director of research at the Ohio Supercomputer Center and served as interim co-executive director of the center from 2009-2012.

Krishnamurthy conducts research in signal/image processing, high performance computing, parallel high-level language applications and computational models of hearing. He was one of six Ohio State faculty working to scale up the capabilities of fully autonomous vehicles so that they are capable of operating in mixed-traffic urban environments, with



Krishnamurthy

funding from a \$1.5 million grant from the National Science Foundation's Cyber-Physical Systems program. He created a learning, probabilistic framework that analyzes vehicle data in order to deduce what the driver is going to do.

On an entrepreneurial leave of absence from Ohio State, Krishnamurthy started a design center in Dublin, Ohio, for Ecrio Inc., a Silicon Valley startup. He led a team of engineers at the design center developing wireless and handheld communication applications.

Krishnamurthy resides with his family in North Carolina where he is deputy director of Renaissance Computing Institute (RENCI) at the University of North Carolina, Chapel Hill. •

Helping Others Matters Most

Nothing inspires Veronica Wyrwas, '69 MS EE, more than helping people achieve their goals

The secret to Veronica Wyrwas' success is understanding what she calls her chapter one, or what inspires her to get out of bed and go each morning.

"It took a while to figure that out, but what my chapter one is, what I like to do more than anything in the world, is help other people succeed. To know that you have actually helped someone achieve dreams and goals is very intoxicating," said Wyrwas. "Helping clients get what they really need is also a great motivator. I feel that if everyone figures out what it is they love to do, and finds a job that allows them to do it, they don't need to do anything else."

Not only did finding her chapter one help Wyrwas succeed, it has also helped many of her students and the individuals she's mentored.

"I taught for a long time at Utica College, in the master's for economic crime program, and many of my students were NYPD officers," she said. "That was pretty thrilling. Many times, the chapter one story is what got them what they needed."



Wyrwas

Originally, Wyrwas wanted to be a mathematician, but she decided engineering had better career prospects. Plus, the engineering jobs turned out to be more exciting.

Wyrwas came to The Ohio State University to pursue a master's in electrical engineering and to study with the professors at the ElectroScience Laboratory, which

has consistently maintained a national and international preeminence in electromagnetics since 1942.

"My job required deep skills in electromagnetism, signal propagation and antennas. Ohio State had the ElectroScience Laboratory, the best in the nation," she explained. "Having the opportunity to work with professors who actually wrote the books and worked contracts with clients in these technical areas is a pretty heady experience."

After leaving the university, she embarked on a career that started with analyzing, designing and installing specialized antennas. It provided the opportunity to travel the world, experience many cultures and face

varied challenges in field engineering.

Today, Wyrwas works as vice president at Science Applications International Corporation, in an organization that keeps computer hackers out of a client's network. She supports commercial and government cybersecurity operations. Previously, she held positions at Global Integrity Corporation, a subsidiary of SAIC; Atlantic Research Corporation; and the Department of Defense.

"Knowing that clients who seek our help will actually get help that matters," is what she finds most rewarding about her job.

Ultimately, it all leads back to her chapter one—helping people—and it's something she does in many ways and through various roles.

"I used to teach at night at the University of Maryland. I was given a class of women who worked at the Department of Agriculture and who were listed to be terminated if they did not re-tool their skills," she said. "Algebra was a mandatory class that they had to pass. Of course they all hated math. We all worked hard; we all had great, great fun; they all passed; and one student went on to teach math herself. Those courageous women were fabulous." •

Alumni Updates

1940s

Roderic Lowman, BS EE '43, of Greenlawn, N.Y., received a Lifetime Achievement Award from the IEEE Long Island Section, the highest award bestowed by the organization, in recognition of his 70 years of service to IEEE. Lowman retired from Airborne Instruments Lab in 1985. At AIL, he led a group that developed signal recognition and location techniques and helped develop the surveillance system for Lockheed's SR-71 Mach 3, a strategic reconnaissance aircraft.

1960s

Constantine Balanis, PhD EE '69, received a 2012 Distinguished Alumnus Award from The Ohio State University College of Engineering. He is the Regents' Professor of electrical engineering at Arizona State University.

1970s

Burn J. Lin, MS '65, PhD '70, EE, was awarded the 2013 IEEE Jun-ichi Nishizawa Medal for outstanding contributions to material and device science and technology.

Lin, who is vice president of research and development and Fellow at Taiwan Semiconductor Manufacturing Company, was recognized "for contributions to lithographic manufacturing, including immersion lithography."

1980s

Robert S. Chau, BS '84, MS '86, PhD '89, EE, was elected to the National Academy of Engineering in 2013 for contributions to CMOS transistor technologies for advanced logic products. *continued next page*

Creating a Climate-Friendly Campus, One Lab at a Time

Matt Gudorf, '00 ECE, was named Energy Engineer of the Year by the Southern California Chapter of AEE

Universities around the globe are striving to operate in a sustainable manner, while continuing to grow and thrive as research institutions. The University of California, Irvine has had great success in becoming more climate-friendly, thanks to the efforts of the campus energy team and Ohio State alumnus Matt Gudorf.

"I have three main job duties as campus energy manager. I handle energy procurement for the campus and act as the liaison between the utilities and the university," said Gudorf. "I also oversee the team that works on efficiency and energy reduction programs on campus. The third area is renewable energy. I work with outside contractors and vendors to try to set up power purchase agreements and procure renewable energy for the university."

Gudorf was recently named Energy Engineer of the Year by the Southern California Chapter of the Association of Energy Engineers. He earned the kudos for reducing normalized energy consumption at UC Irvine, even as the number of buildings and the square footage grows; successfully incorporating extensive solar renewables into the campus grid; and operating an on-site 13 MW gas turbine and highly flexible waste heat recovery system.

Progress was made while balancing savings against minimum grid imports and volatile energy markets, and with no discernible energy budget increase.

"It's very gratifying to get this type of professional recognition," said Gudorf. "In my mind, this award reflects the collective accomplishments of my co-workers and a commitment to excellence promoted by our management."

The key to the campus' energy reduction success has been addressing the university's laboratories, the biggest load source by far.

"This is a research university. We basically run 24/7, 365 days a year. School or no school, it really doesn't change how much energy is being used at this campus, but by a fraction," said Gudorf.

After identifying the biggest load source, the UC Irvine team developed a program, called Smart Labs, to reduce that load. The program has won multiple awards for being innovative and effective.

"Our team developed a set of retrofits and new design criteria that can reduce energy use in the laboratories by fifty percent or more," said Gudorf.



"Smart Labs and the energy reduction that has taken place on this campus is probably what I take the most pride in."

While he always knew he wanted to be an engineer, defining which engineering discipline was the best fit has always been a challenge.

Gudorf "I don't know that I ever knew really which engineering discipline

I wanted to be in, and I probably still don't to this day, because I bounce back and forth," he said. "I've done things in my career that are civil based. I've done electrical. I've done mechanical. It has always been interdisciplinary."

Taking the interdisciplinary approach has worked for Gudorf, both for solving the many challenges his work as campus energy manager involves, and for his career.

"I followed a career path that started out in engineering, left engineering and then went to construction project management that happened to evolve back into engineering," said Gudorf. "But that's probably been really good for me as well." •

Alumni Updates

continued... **Robert Chau** is a Senior Fellow and director of transistor research and nanotechnology, for Intel's Technology and Manufacturing Group in Hillsboro, Ore.

Eric Evans, BS '83, MS '85, PhD '88, EE, received a 2012 Distinguished Alumnus Award from The Ohio State University College of Engineering. He is the director of MIT's Lincoln Laboratory in Lexington, Mass.

Manu Mehta, BS '80, MS '82, EE, received a 2012 Distinguished Alumnus Award

from The Ohio State University College of Engineering. He is president and CEO of Metabyte Inc., which he founded in 1993.

1990s

Jason D. Eisenberg, BS EE '94, was elected director of Sterne, Kessler, Goldstein & Fox PLLC, an intellectual property law firm based in Washington, D.C.

David Bals, BS EE '93, of Dublin, OH, was appointed national data center practice leader by URS Corporation.

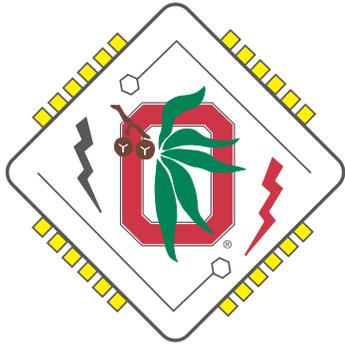
He has been with URS since 1998 and is a licensed professional engineer in 13 states.

2000s

Qussai Marashdeh, MS '03 and PhD '06, EE, was named 2012 Student Innovator of the Year by the Ohio State Office of Research. Marashdeh is a senior research associate in the Department of Chemical and Biomolecular Engineering and is co-founder, president and CEO of Tech4Imaging LLC.

Submit alumni updates via e-mail to ece_alumnicord@ece.osu.edu

EE/ECE Alumni Society



EE/ECE Alumni Society
The Ohio State University
Alumni Association, Inc.

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Get LinkedIn with Your Fellow Alumni

Looking to connect with other Ohio State EE/ECE alumni and faculty? Join the EE/ECE Alumni Society's LinkedIn group!

We hope to make this a forum for alumni to connect with colleagues in other companies, share ECE-related news and network with ECE faculty. It's also a great way to give back by interacting with current students and answering their questions about job applications, interviewing, working in industry, weighing different opportunities, etc.

Find the group by searching LinkedIn for "OSU EE/ECE Alumni Society" or go to the group page at go.osu.edu/linkedinece to join.

This is an optional group to join and does not require donations or fundraising or money. It is intended to be a forum with involvement driven by the alumni.

Please contact ECE_AlumniCoord@ece.osu.edu if you have any questions. •

President's Message

Written by Robert Borel, EE class of 1965

As summer activities move into full swing, Ohio State and your ECE department have completed its first year on a semester schedule. As you plan your summer and fall schedules, remember to note this year's Homecoming-Reunion football game date of Saturday, October 19, 2013, vs Iowa. Again this year, your EE/ECE Alumni Society has secured a block of tickets which are available per the process described on the next page. Take advantage of this fun opportunity to renew your relationships with other ECE alumni.



This year, your society has initiated a growing professional presence via the networking site LinkedIn. We invite you to join our fast growing group of networked Ohio State ECE alumni (*see separate article on this page for complete details*). In addition, the society's Networking and Career Development Committee, under the leadership of Vimal Buck, is considering the development of a mentoring activity for ECE students, as well as a continuing education program for alumni. This committee welcomes additional volunteer assistance in formulating these programs during the next year.

We also need volunteer assistance on the Meetings and Programs Committee. This committee focuses on defining and marketing the society's programs and events, which encourage participation of students and alumni alike to further the goals of the society. If you are interested in serving on one of these committees, please contact me via e-mail at rjbrl@earthlink.net.

We would also welcome some help staffing our registration table prior to the football game at the College of Engineering's tailgate to be held on the patio between Knowlton and Hitchcock Hall. This is where EE/ECE alums will check in to participate in the tailgate and pick up football tickets purchased from the society. I look forward to personally meeting many of you there!

We'd love to hear from you this summer and see you in the fall! •

Robert Borel graduated from The Ohio State University with a BSEE, MS in 1965 and an MBA in finance from the University of Rochester in 1974. He is currently the CEO of BeamAlloy Technologies, LLC and lives in Naples, FL with his wife, Lynn.

Join ECE for Reunion-Homecoming Weekend

Celebrate Reunion-Homecoming Weekend with your friends in the Department of Electrical and Computer Engineering and the EE/ECE Alumni Society on Saturday, October 19, 2013. Join us and other engineering societies for a carnival-like pre-game tailgate complete with cotton candy and popcorn machines, catered by Schmidt's. The tailgate, which will be held on the patio between Knowlton and Hitchcock Hall, starts at 12:30 p.m. and is part of our football game/tailgate ticket package. If you already have football tickets, you may purchase tailgate-only tickets. Registration information is below and online at ece.osu.edu/alumni/society/2013football. Contact Carol Duhigg, 614-292-7392 or duhigg.2@osu.edu with questions.

How to register

Registrations for the EE/ECE Alumni Society Homecoming-Reunion may be made by calling Ohio State Alumni Association's customer service at (614) 292-2281 or (800) 762-5646. While you are on the phone, the agent will check your eligibility to purchase up to two football game/tailgate packages, take your credit card information (Visa, MasterCard, or Discover are accepted) and confirm your registration. This eliminates the need to require checks in advance.

Ticket package registration release dates – mark your calendar!

Tickets are available on a first-come, first-served basis beginning on the following registration release dates:

August 21: Registration opens for Reunion years – 1963, 1988, 2003 & 2008

August 26: Registration opens for remaining EE/ECE alumni

Costs and Eligibility

EE/ECE Alumni Society Activity Fee: \$20 – required to be eligible to purchase up to two game/tailgate packages. The activity fee is for calendar year 2013 and will also



Event Schedule: Saturday, October 19, 2013

12:30 pm Tailgate begins on Knowlton Patio
3:30 pm Game time for Ohio State vs Iowa

count toward your OSUAA sustaining membership requirement for 2014.

Game/Tailgate Package: \$104 per package, plus paid 2013 activity fee (\$20). Each game/tailgate package includes one ticket to the OSU vs Iowa game plus one ticket to the College of Engineering Reunion-Homecoming pre-game tailgate.

Tailgate only: These can be purchased at the tailgate the day of the event or via the College of Engineering online system at engineering.osu.edu. The cost is \$20 per person ages 10 and above, and free for children ages 9 and under.

Sponsor a current ECE student(s) to attend the tailgate: \$20, regardless of activity fee status.

Eligibility for Game/Tailgate

Packages: In addition to the required EE/ECE Alumni Society activity fee listed above, you must be an Active Member (sustaining or life member) of the Ohio State Alumni Association. You are also not eligible if you received OSU vs Iowa game tickets through the OSUAA lottery, or any other source, including season ticket holders (whether in your name or your spouse's name).

Processing Fee: A \$5 processing fee will be added to each transaction.

Ticket package pick-up

You will receive your football tickets when you check in at the EE/ECE Alumni Society registration area at the tailgate. For our protection, and yours, a photo ID will be required. Sorry, tickets cannot be mailed.

Scholarship donations appreciated

Donations to the EE/ECE Alumni Society scholarship funds may be made during Homecoming-Reunion registration or online at www.osu.edu/giving. If you would like to donate to any of our scholarship funds, any amount is appreciated and will count toward your OSUAA sustaining membership requirement for 2014. Ohio undergraduate students, fund #312547; non-Ohio undergraduate students, fund #312548; graduate students who were former OSU ECE undergraduate students, fund #312549. •

THE OHIO STATE
UNIVERSITY

REUNION
HOMECOMING
2013

205 Drees Laboratories
2015 Neil Avenue
Columbus, OH 43210-1272
14450 017000 61801

Chair, Electrical and Computer Engineering
Dr. Robert Lee, lee@ece.osu.edu

Editor & Graphic Designer
Candi Clevenger, clevenger.87@osu.edu



Portrait of a Scholarship Recipient: Mike Herman

Mike Herman is a senior ECE major, focusing on computers and controls.

Why did you choose to attend Ohio State?

I chose Ohio State because of the overwhelming opportunity the university offers.

There's so much to do here and it's really easy to get involved in something you love.

What have been the highlights of your Ohio State experience?

Some of the highlights of my Ohio State experience are: going to football games with 100,000 of my best friends, finding my niche in a new city, participating in awesome events like MLK Day of Service, and discovering influential people and experiences that have shaped who I am and where I want to go.

How have the ECE scholarships you have received affected your college experience?

The scholarships that I have received from ECE and the university have pushed me to

work harder in the classroom and have made me realize the gratification that comes with effort. I'm grateful to have been awarded these scholarships and they've helped alleviate some financial stress.

What would you say to your benefactors if they were here now?

I'd tell my benefactors how appreciative I am of their generosity. I will make sure every penny is well spent, and if one day I am fortunate enough, I will do the same for the next generation of students.

Have your studies made an impact on your life outside the classroom?

My life outside the classroom has probably affected my studies more than the other way around. In January, I was diagnosed with leukemia. However, I was blessed to quickly enter remission with the help of the driven and passionate individuals at the James Cancer Hospital at The Ohio State University Wexner Medical Center.

I'm forever indebted to the nurses and doctors of this great university. Furthermore, this event has instilled in me a desire to give back to healthcare and the medical field. I've decided to add a neuroscience minor, and to pursue courses that are relevant to the medical field. In a way, I guess studying engineering and medicine complete the cycle, also giving back to the community and life outside the classroom.

What are your career aspirations?

My aspirations include a career that combines engineering and healthcare. I want to explore biomedical technologies, specifically I think that medical imaging technologies would be really cool to pursue, as well as prosthetics. •

Visit ece.osu.edu/alumni/support for information on how you can support ECE students.