

CONNECTIONS

WINTER 2015



FOUNDING A UNIVERSITY

ECpE alum Edward Walsh looks back on his tenure at Iowa State, and the founding of the University of Limerick.



Greetings from Iowa State. When this issue reaches you, the winter weather will be in full swing and semester break will be upon us.

In this issue of *Connections*, we highlight a number of our faculty achievements. Department faculty continue to distinguish themselves among their peers, and have garnered a number of national and international awards in the last year. Three faculty members, **Degang Chen**, **Diane Rover**, and **Zhengdao Wang** were elected IEEE Fellows for 2016 (Opposite page). Their election gives the department a total of 18 IEEE Fellows out of 60 total faculty.

The department's faculty numbers continue to grow as ECpE enrollment remains at record highs. ECpE hired four new faculty in the fall, including assistant professors **Neil Gong**, **Chinmay Hegde**, and **Zhaoyu Wang**, and lecturer **Swamy Ponpandi** (Page 2). More faculty hires are planned to keep pace with the department's rapid expansion.

It's not just faculty making news. **Erik Lee**, a junior with the Transcranial Magnetic Stimulation group, won a best poster award from the American Physical Society (APS) (Page 6). Our students are some of the best engineering students in the world and awards like Erik's make us proud of our continued dedication to engineering education.

Finally, our cover story on ECpE alum **Edward Walsh** (Page 10), who earned a master's degree and a P. hD. in electrical engineering at Iowa State and became the founding president of Limerick University in Ireland, is a testament to the department's legacy as an educator of successful men and women.

I hope you enjoy this issue of *Connections* and I wish you a very happy holiday season.

Warmest wishes,

David Jiles

David C. Jiles

Anson Marston Distinguished Professor, and
Palmer Endowed Department Chair
Department of Electrical and Computer Engineering

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IEEE
DEPARTMENT
FELLOWS

Eighteen ECpE faculty have
been elected IEEE Fellows:

Venkataramana Ajjarapu
Degang Chen
Chris Chu
Vikram Dalal
Ian Dobson
Randall Geiger
Manimaran Govindarasu
Doug Jacobson
David C. Jiles
Ahmed Kamal
Ratnesh Kumar
James McCalley
Sarah Rajala
Diane Rover
Arun K. Somani
Jiming Song
Zhengdao Wang
David Weiss

Established in 1912, the IEEE Fellow distinction is an honor reserved for select IEEE members whose extraordinary accomplishments in any one of the IEEE fields of interest are deemed fitting of this grade elevation. The IEEE Grade of Fellow is conferred by the IEEE Board of Directors, and the total number of recipients in any one year cannot exceed one-tenth of one percent of the total voting membership. IEEE Fellow is the highest grade of membership and is recognized by the technical community as a prestigious honor.

THREE FROM ECPE NAMED IEEE FELLOWS

Degang Chen, Diane Rover, Zhengdao Wang honored.

BY BROCK ASCHER

Three faculty members from the Department of Electrical and Computer Engineering at Iowa State University were elected fellows of the Institute of Electrical and Electronics Engineers (IEEE) for 2016. **Degang Chen**, Jerry R. Junkins Chair; **Diane Rover**, University Professor; and **Zhengdao Wang**, professor, were honored.

"It is an honor to be elected an IEEE Fellow and an important milestone in my professional career," Wang said. It is both a recognition of my past work and an encouragement for making future contributions to the professional societies."

Chen was elected for contributions to high speed VLSI testing. His testing methods are now standard at Texas Instruments. Rover was elected for her contributions to active learning methods in engineering education. Much of her work helps advance teaching practices and expand the reach of STEM education. Wang was elected for his contributions to the field of wireless communication. His work centers on wireless security, communication and networking for the Internet of Things (IoT), and big data signal processing.

The election of Chen, Rover, and Wang gives the ECpE department 18 IEEE fellows out of 60 total faculty.

"It's a personally and professionally fulfilling

moment when you receive the news," Rover said. "Iowa State has provided an environment and opportunities for me to be successful in my career."

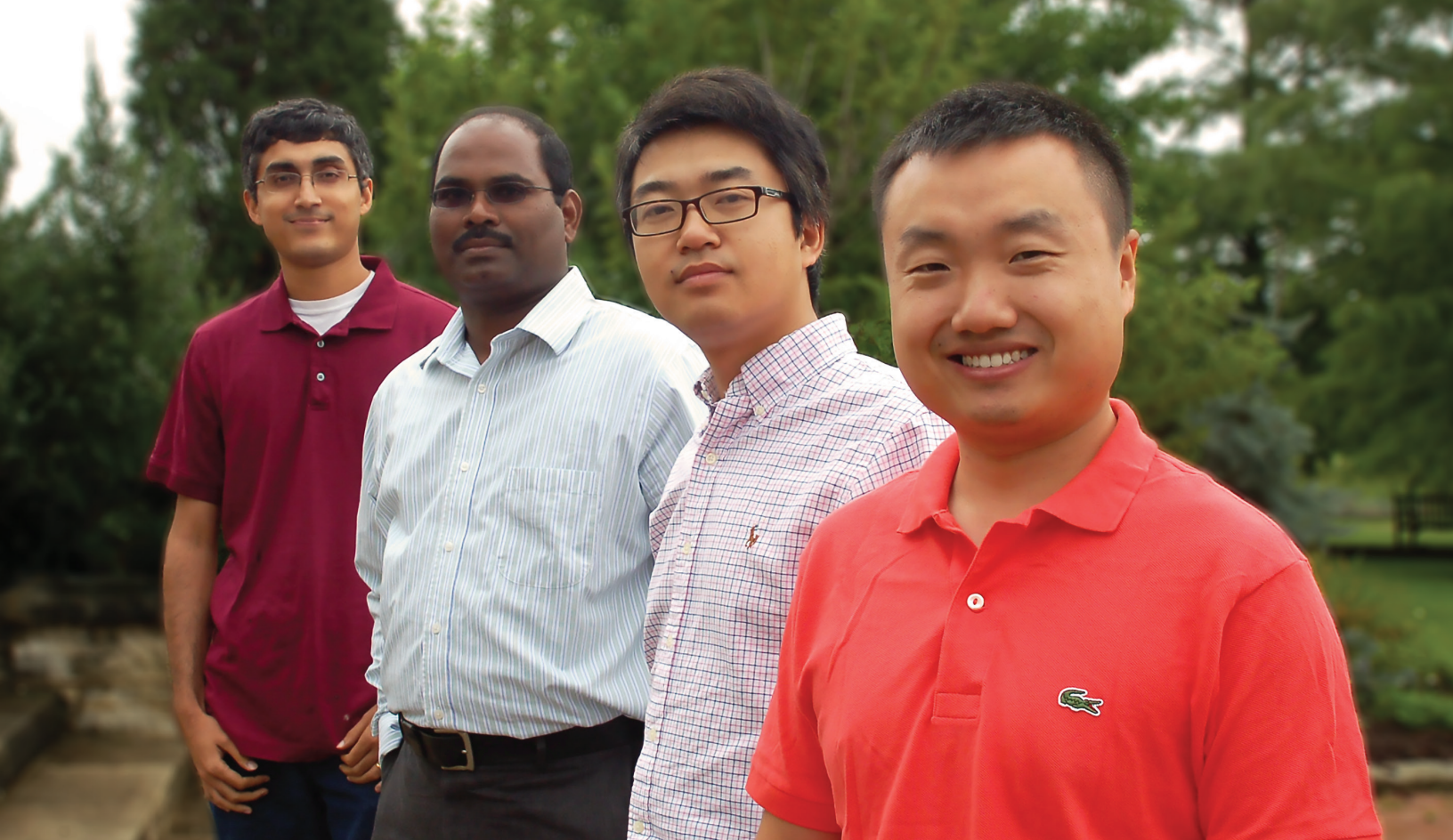
"Iowa State is where I got my first real job," Wang said. "It continues to provide a great working environment for me to build my career."

"Iowa State has given me the opportunity to advance my research," Chen said. "It is a wonderful place to work, teach, and learn."

The IEEE Grade of Fellow is conferred by the IEEE Board of Directors upon a person with an outstanding record of accomplishments in any of the IEEE fields of interest. The total number selected in any one year cannot exceed one-tenth of one percent of the total voting membership. IEEE Fellow is the highest grade of membership and is recognized by the technical community as a prestigious honor and an important career achievement.

The IEEE is the world's leading professional association for advancing technology for humanity. Through its 400,000 members in 160 countries, the IEEE is a leading authority on a wide variety of areas ranging from aerospace systems, computers and telecommunications to biomedical engineering, electric power and consumer electronics.

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↑ Above

From left: Chinmay Hegde,
Swamy Ponpandi, Neil
Gong, Zhaoyu Wang

ECpE WELCOMES FOUR NEW FACULTY

Gong, Hegde, and Wang hired as assistant professors. Ponpandi brought on as lecturer.

BY BROCK ASCHER

The ECpE Department recently announced the hiring of four new faculty members. **Neil Gong**, **Chinmay Hegde**, and **Zhaoyu Wang** were hired as assistant professors, while **Swamy Ponpandi** was hired as a lecturer.

“The department is expanding through enrollment and through its research portfolio,” said **David C. Jiles**, Palmer Endowed Department Chair of ECpE and Anson Marston Distinguished Professor. “Expanding department faculty numbers is another part of ECpE’s unprecedented period of growth.”

ECpE’s four new faculty members are profiled below:

Neil Gong - Assistant Professor (Center right)
Gong received a Ph.D. from the University of California, Berkeley and focuses his research on the intersection of security and privacy with data science. In particular, Gong focuses on security and privacy issues in social media and mobile computing.

Chinmay Hegde - Assistant Professor (Left)
Hegde earned a Ph.D. from Rice University and spent two years as a postdoctoral research assistant at the Massachusetts Institute of Technology. His research interests include signal and image processing, algorithm design, and machine learning.

Swamy Ponpandi - Lecturer (Center left)
Ponpandi holds a Ph.D. in computer engineering from Iowa State University. He is interested in programming for mobile computing platforms, embedded system design, and network-on-chip communication models for multi-core mobile architecture.

Zhaoyu Wang - Assistant Professor (Right)
Wang earned a Ph.D. from the Georgia Institute of Technology. His research interests include microgrids, self-healing resilient power distribution grids, voltage/VAR control, and demand response and energy conservation.

Department

Students

Alumni

KUMAR AWARDED PATENT

Ratnesh Kumar, professor of Electrical and Computer Engineering at Iowa State University, recently was awarded the patent for “Semantic Translation of Stateflow Diagrams into Input/Output Extended Finite Automata and Automated Test Generation for Simulink/Stateflow Diagrams.”

MathWorks developed Simulink/Stateflow to assist in designing software for applications such as controls, signal processing, communication, and much more. Kumar's patent provides a means to automatically generate test cases for testing such software, thereby enabling early detection of software errors.

“This patent will help protect our invention and allow us to explore its marketability in future applications,” said Ratnesh.

According to Kumar, these software errors are the number one cause for field calls. That is what motivated him to create and work on this technology, which will provide a model-based solution for software error detection and error localization.

“We have invented a method to automatically test software written in Simulink/Stateflow, which is the most widely used tool of its kind,” said Kumar. “Our technique uses a model-based design to provide for early detection of software errors that can result in huge savings for designers as well as spot any potential accidents resulting from erroneous code.”

The work was completed in collaboration with **Meng Li**, a former Ph.D. student from Kumar's research group, currently employed at the General Electric Corporate Research Headquarters in Schenectady, NY.



Ratnesh Kumar
Professor



UP MULTIMEDIA WALL UPDATE

Phase two of the Union Pacific Multimedia Wall project has been completed and was implemented over the summer. The wall features a new interface, new videos and apps, and new student-created content.

Students built and launched a number of new apps as part of the department's senior design program. A full-screen map that tracks CyRide busses, a map of star constellations, and three different music applications are included. An Android-powered video game and a faculty/staff directory created by phase one students were updated to run on the new interface.

The wall's attract loop has been updated to feature high definition science and nature videos that more fully utilize the screen's features, including the 5.1 digital surround sound system. Videos are played at full definition and fill the screen with images of forests, deserts, oceans, space, and more.

Future plans for the UP Multimedia Wall include phase three students beginning work during the Spring 2016 semester. Considered projects include a mirror application, a weather application, and numerous technical updates to improve speed and performance. ■

DEPARTMENT HEADLINES

DOLUCA ELECTED SIA VICE CHAIR

The Semiconductor Industry Association (SIA), representing U.S. leadership in semiconductor manufacturing, design, and research, announced the SIA Board of Directors has elected **Tunç Doluca**, President and CEO of Maxim Integrated and ECpE alum, as its 2016 Vice Chair.

“I'm excited to take on a leadership role for SIA in support of the U.S. semiconductor industry,” Doluca told SIA. “We face tremendous opportunities and unprecedented challenges in the coming year, and I look forward to getting to work to help move our industry forward.”

RAJALA RECEIVES RIGAS AWARD

Sarah Rajala, dean of the Iowa State University College of Engineering, is the 2015 recipient of the Harriett B. Rigas Award from the Institute of Electrical and Electronics Engineers Education Society.

Rajala received the national award that recognizes outstanding female faculty for exceptional contributions to electrical and computer engineering education and the global engineering community through student and faculty development, transformational and inclusive institutional and professional leadership, and engineering accreditation service.

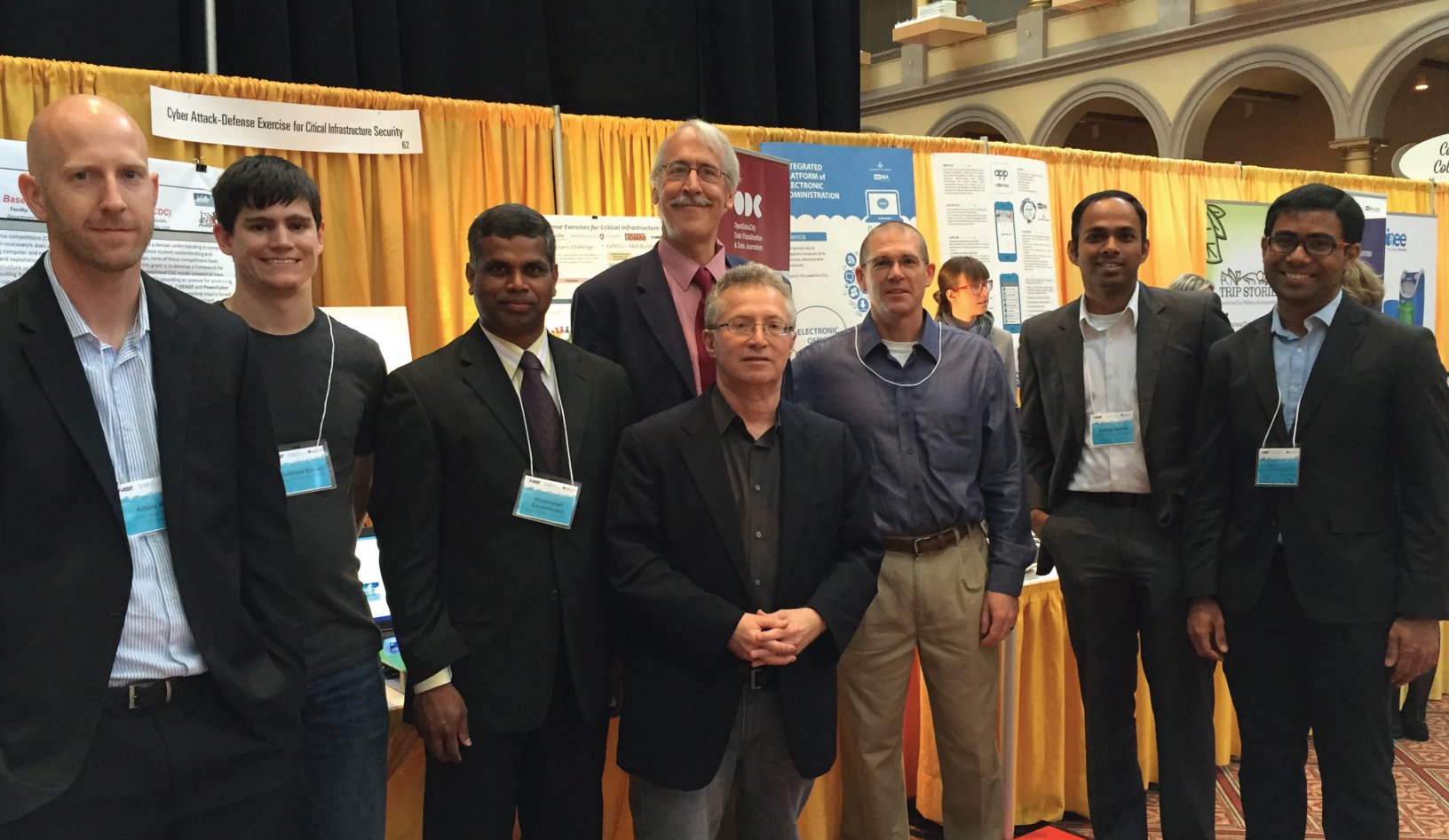
DIGITAL LUMENS NAMES STEVE RONNEBERG VICE PRESIDENT OF WORLDWIDE SALES

Digital Lumens announced the appointment of ECpE alum **Steve Ronneberg** as its vice president of sales in October. Ronneberg earned a bachelor's degree in electrical engineering from Iowa State and previously was Vice President of North American Sales at Belden. Additionally, Ronneberg spent 19 years at Rockwell Automation.



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 **Above**
The ISU Global Cities
Team Challenge team.

IOWA STATE AWARDED NSF GLOBAL CITY TEAMS CHALLENGE PROJECT

Part of a \$2.5 Million NIST initiative designed to showcase smart technology with the potential transform cities.

BY BROCK ASCHER

A team of researchers from the Department of Electrical and Computer Engineering at Iowa State University was awarded one of 12 Global City Teams Challenge (GCTC) research projects by the National Science Foundation. The GCTC, a \$2.5 million initiative issued by the National Institute of Standards and Technology (NIST), is designed to showcase smart technologies with the potential to transform cities and communities around the world. The projects were announced at a White House event that kicked off the first-ever Smart Cities Week.

The ISU team has developed an integrated testbed platform that provides cyber/physical attack-defense training for critical infrastructure stakeholders. CyDECS: Cyber Defense Exercise for Critical Infrastructure Security, was first showcased at the GCTC Expo held in the National Building Museum in Washington D.C., June 1. **Manimaran Govindarasu**, Mehl Professor of engineering and

Associate Chair of ECpE, is leading the team developing the project.

"The team has built a virtual testbed platform, with hardware-in-the-loop capabilities, that can mimic cyberattacks and defenses on physical systems, like the power grid," Govindarasu said. "We can't practice attacks on real systems without causing actual damage, so a virtual testbed environment is the way to go." He added, "This platform will significantly advance the cyber security training capabilities for critical infrastructure owners and first responders by transitioning the current 'table-top' exercise to a more realistic testbed-based training experience."

The project, designed to replicate physical infrastructure like the power grid in a digital space, is partially funded by the Department of Homeland



Manimaran Govindarasu
Mehl Professor

Department

Students

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Security (DHS). The team is collaborating with researchers at the University of Southern California and Washington State University and has partnered with the Iowa Air National Guard to further the project. The team also is exploring collaborative opportunities with North American Electric Reliability Corporation (NERC) to organize training programs for electric utilities. The team isn't just focused on electric utilities, however.

"It's not just the power grid that we have to take into account," Govindarasu says. "There are so many smart devices out there connected to the internet, and that number will only go up.

He's talking about the Internet of Things (IoT), a network of machines, devices and objects that feature microcontrollers, sensors, actuators, and software that connect them to the internet. For example, soon nearly every appliance, including washing machines and refrigerators, will ship with software that enables an internet connection. With everything connected to a network, the risk posed by hackers will only increase.

"Right now, hackers are mainly focused on identity theft and credit card fraud," said **Doug Jacobson**, University Professor of engineering, director of the Information Assurance Center at Iowa State, and member of the CyDECS team. "In the near future, a hacker could presumably break into your home network and take control of everything. Your washing machine, your thermostat, your lights. They could cause physical damage that way."

Through the GCTC, more than 50 forward-looking cities and communities have partnered with private organizations, universities and not-for-profit organizations to accelerate the deployment of IoT technologies designed to address some of the most pressing challenges facing local communities. ■



HADIMANI WINS OUTREACH AWARD

Ravi Hadimani, associate scientist and adjunct assistant professor in the Department of Electrical and Computer Engineering, recently was honored with an outreach award from the Topical Group on Magnetism and its Applications (GMAG), a sector of the American Physical Society. Hadimani's proposal "Stimulation of Human Brain Using Magnetic Fields" was approved for financial support in the amount of \$4,900.

"It's nice that APS has recognized our work on brain stimulation as a topic the public needs to be aware of, especially school children," said Hadimani.

Each year, Hadimani and his research group have organized and facilitated field trips for Boone Middle School students. These visits include a tour of the group's labs on the ISU campus and lectures on the advances in magnetic stimulation given by the researchers. With increased funding, Hadimani hopes to make these experiences even more beneficial to the students in attendance.

"We have been chosen for this award because our work on brain stimulation is exciting," said Hadimani. "Our group has a great track record of outreach programs."

In addition to his outreach work, Hadimani has research interests in biomagnetics and magnetic devices and materials. He is working on various projects in the Magnetics Research Group headed by Palmer Endowed Department Chair of ECpE, and Anson Marston Distinguished Professor **David C. Jiles**.

"I have been actively involved in the magnetic brain stimulation project at the department and part of the ISU BRAIN Initiative Team," Hadimani said. "We are dedicated to developing new safe, non-invasive brain stimulation techniques to treat various brain disorders.

Each year the GMAG Executive Committee receives numerous outreach proposals from all over the country. The committee reviews these proposals extensively and narrows the large number of submissions down to two.



Ravi Hadimani
Associate Scientist,
Adjunct Assistant
Professor

ECpE CALENDAR

DECEMBER 21 - JANUARY 1
Semester Break
ECpE Offices Closed

JANUARY 11
First day of Spring Classes

JANUARY 18
University Holiday
Offices Closed

MARCH 14-18
Spring Break

APRIL 7
External Advisory Board
Meeting
3043 ECpE Addition; All Day



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 **Above**

Erik Lee receiving his Best Poster Award at the March meeting of the American Physical Society

LEE WINS APS BEST POSTER AWARD

Poster on Transcranial Magnetic Stimulation (TMS) research recognized.

BY MICHAEL STILL

Erik Lee, a junior in electrical engineering at Iowa State University, recently received a Best Undergraduate Poster Presentation award from the American Physical Society (APS) for his research on Transcranial Magnetic Stimulation.

“It was really exciting to receive this award,” said Lee. “I wasn’t expecting to win anything, but it was a great honor to be recognized for my work.”

Transcranial Magnetic Stimulation, commonly referred to as TMS, is a tool that uses magnetic pulses to stimulate brain activity. TMS currently is used as a therapeutic treatment for chronic depression and migraines, but researchers have tested the tool on just about every brain-related disease. Lee created a measure of focality to quantify the electric field induced in the brain from TMS.

“This measurement relates the total surface area of the brain being stimulated to the total volume of the brain being stimulated. With this, I then compared four common coil designs used in TMS to show which ones stimulate the brain in the most focal way. The resulting measure could almost be described as a weighted depth to the electric field,” explained Lee.

Lee pitched his idea to **Ravi Hadimani**,

associate scientist and adjunct assistant professor in the department of electrical and computer engineering. Hadimani encouraged him to submit an abstract to the American Physical Society’s March meeting. Upon returning from winter break, Lee learned that his abstract was accepted.

“From there, I started working through what information I should include on my poster that would best prove the point I was trying to make,” said Lee. “I read many papers to see what work others had done in this area, and Dr. Hadimani was also a great resource throughout the entire process. He gave me pointers on everything from proving the accuracy of my findings to how I should format my poster.”

According to Lee, time posed the greatest threat to his work, as each simulation he ran ended up taking at least two hours to complete. Additionally, he had to compete with other students to use the simulation software, so Lee often found himself running his computer simulations late at night or on the weekend to secure the results needed for his poster.

The hard work and unusual hours paid off, however, when it came time to present at the APS

Continued on Page 8...

Department

Students

Alumni

Keep in touch

We want to hear about your career moves and personal news for future issues of *ECpE Connections*! Please fill out the form below or online at www.ece.iastate.edu/alumni (click Alumni News Form) to share your news.

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State: _____	Zip code: _____
Country: _____	E-mail address: _____
Home phone: _____	Business phone: _____
News I'd like to share: _____	

Support the Department

The ECpE department relies heavily on the support of our alumni and friends to ensure that students have access to scholarships and the latest lab facilities and classroom spaces, that faculty can continue to support graduate students and conduct state-of-the-art research, that department facilities remain updated for staff to do their jobs efficiently, and that student organizations and department events can continue to thrive.

If you would like to help the department continue to be one of the best in the country, you can support the department through several funds. Additional opportunities are available to support endowments and building space. Please check the appropriate box below if you want to offer your support today, or visit www.foundation.iastate.edu. For more information about the funds, contact the ISU Foundation's Adam Laug at 515 294-4883 or alaug@iastate.edu.

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ECpE Coover Hall Building Project

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...Continued from Page 6

March Meeting in San Antonio, Texas. Lee says his favorite part of this process has been presenting.

“This was my first time attending a conference and I really enjoyed the whole experience and atmosphere,” said Lee. “Most people don’t have much

background knowledge about TMS, but everyone who stopped by to talk about my work was really interested about the field. They were able to give me some pointers on different aspects of my research that I could expand on.”

Lee has been working with the

Magnetics Research Group for more than a year and this summer he will be traveling to the University of Cardiff in Wales to continue his research. He hopes to expand on his current work to show how focality may change in different brain regions or within different patients. 



IOWA STATE UNIVERSITY

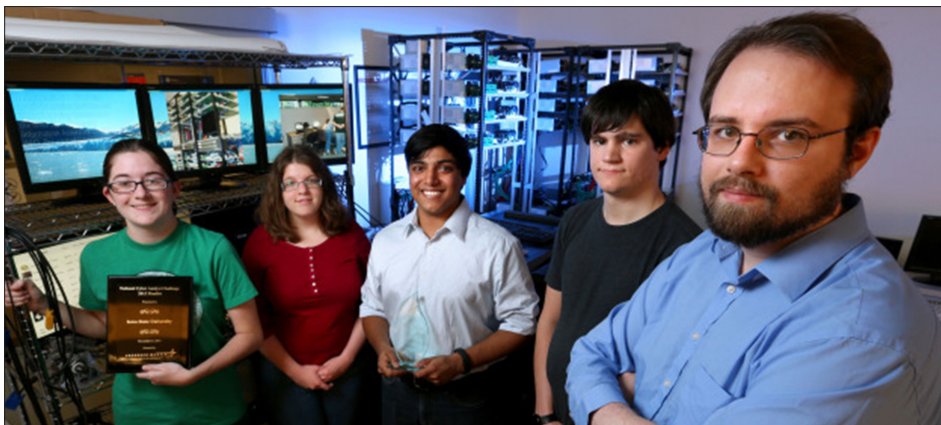
Dept. of Electrical and Computer Engineering

Attn: Communications Specialist

2215 Coover Hall

Ames, IA 50011-3060





STUDENT CYBER ANALYSTS WIN NATIONAL COMPETITION

BY ANGIE HUNT

A security breach is detected at a small business. Teams of cyber analysts are briefed about the situation and given five hours to answer three questions: Are the cyber-attacks connected? Whose account was used to access the server? And did anyone open the malicious email?

This was the final task given to a team of Iowa State University students – and teams from eight other universities – competing in the National Cyber Analyst Challenge. And while it's just a competition, it's a scenario that businesses, large and small, must contend with on a regular basis. Identifying the threat and correctly answering the questions earned the ISU team a \$25,000 prize for winning the challenge.

This is the first year for the competition, sponsored by Lockheed Martin and Temple University's Institute for Business and Information Technology. It was developed to help students build their skills and generate interest to meet the growing demand for cyber security analysts. Members of the ISU team say it was a great opportunity to compete and work with professionals tackling cyber issues.

"The experience, the training and the assistance that Lockheed gives you during the competition is so valuable that it would have been more than worthwhile even if we hadn't won the competition," said **Jason Johnson**, team member and a graduate student in information

assurance and political science.

To compete in the final phase of the challenge on Nov. 6, in Washington, D.C., students had to complete an initial cyber analysis back in September. Instead of five hours, they had three weeks to comb through the massive amounts of data – approximately 75 gigabytes – and determine how an employee's computer was compromised. It was truly like looking for a needle in a haystack.

Although students didn't know it at the time, the evidence collected during that first phase would come into play during the final challenge. During the final briefing, they were given more data files, including hundreds of employee emails, to analyze. The pressure of a five-hour deadline meant students had to work quickly and efficiently.

"There was so much more of the data we could be looking through, but at some point we had to start going off the leads that we had and focus in on the questions," said **Matt Brown**, team member and graduate student in information systems and computer engineering. "There were some rabbit holes that we could have gone down, but we realized we couldn't go too far down a trail or we were not going to finish."

It also helped that the team, a combination of graduate and undergraduate students, had a diverse mix of skills and academic backgrounds. Faculty team advisers say that was by design. Team member **Angela McMahon**

says the chemistry they developed throughout the three-month challenge was a huge asset.

"It worked greatly to our advantage, because each one of us did something different that contributed to the project as a whole. Instead of everyone looking at network logs, some of us could look at memory dumps from a computer. That was helpful because time was our biggest challenge," said McMahon, a graduate student in information systems.

While time was a challenge, students say it's very realistic of the pressure cyber analysts are under when there is a security breach.

"Companies that deal with these cyberattacks need to quickly figure out what happened and how they can at least temporarily fix it, so that they can get back to business as usual," said **Steffanie Bisinger**, team member and a senior in software engineering.

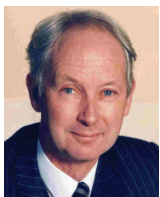
Another realistic element: presenting their findings to the top corporate executives. As the team was analyzing evidence, it was also building a final presentation for the judges. A panel of industry experts scored the teams on technical proficiency, judgement and communication.

"We were to treat this exactly as if it were a real scenario," said **Sambhav Srirama**, team member and a senior in computer science. "The fact that companies, like Lockheed, are sponsoring competitions like this is really a good way for students to apply their skills and get guidance from a company that has to be good at cybersecurity."

Faculty advisers **Jim Davis**, an associate professor of information systems; **Doug Jacobson**, University Professor of electrical and computer engineering; and **John Burnley**, a lecturer of information systems, say the competition will give students a clear advantage with future employers.

"The students were given a very real scenario and an opportunity to practice their craft," Davis said. "This experience will make them stand out from other prospective candidates."

The advisers say winning the competition also shows the strength and breadth of the Iowa State program. The \$25,000 prize will be divided among the students on the team. ■



Edward Walsh

(MSEE '63; PhDEE '64)
Founding President
University of Limerick

Department

Students

Alumni

FOUNDING FATHER

ECpE alum Edward Walsh looks back on his tenure at Iowa State, and the founding of the University of Limerick.

BY MICHAEL STILL

A commitment to sustained hard work and integrity, combined with an ability to communicate one's ideas and ambitions, achieve results and personal satisfaction."

If you were to ask **Edward Walsh** for advice, that's what he would tell you. You'd be smart to listen to him too, because as the founding president of the University of Limerick and an esteemed alumnus of Iowa State University, Walsh is no stranger to success.

Born on December 3, 1939 in Cork, Ireland, Walsh grew up

attending Christian Brothers' College. Its focus on repetition and the importance of rote learning left Walsh with few pleasant memories of his time at school. At least, that is, until he met Dr. **Noel Mulachy**.

"He had just completed his doctorate in physics and he brought science to life," said Walsh. "My friend and I would sit at the front bench vying with each other to pose difficult questions. If it were not for Dr. Mulcahy, the course of my life would most likely have been otherwise."

Outside of the classroom, Walsh led a very active lifestyle. He had a great appreciation for classical music, which led him to take violin lessons and join the orchestra. Walsh also received elocution lessons, as his parents valued the importance of effective speech. He played tennis and golf, but humbly admits he was never superior at either.

He grew up around traditional Irish Catholic beliefs and recalls his very first engineering invention involved automating the rosary. He recorded the Hail

Mary on his vinyl tape recorder, cut the tape, and stuck both ends together to create a continuous loop.

"I presented this piece of new technology to Granny, and she was not sure if she would get the full indulgence or only half using the machine," said Walsh. "She was also troubled by my suggestion that her rosary beads should have a direction arrow fitted so that she always progressed in the same direction."

As he grew older, Walsh dreamed of becoming an architect. Unfortunately, that course of study was not offered

at University College Cork where he was enrolled. He settled with electrical engineering, which, at the time, he considered an exotic choice.

While in school, Walsh dabbled in the arts and humanities, attempting a joint degree. After a while, schedules began to conflict and he didn't find the liberal arts curriculum to be as enthralling as the material he was learning in his other courses. As a matter of fact, there was very little that could pull Walsh away from his engineering studies.

"I found science and engineering so absorbing that I took little interest in campus life," said Walsh. "Or girls, apart from those at dinner dances and Christmas house parties."

After graduation, the thought of finding a job in Ireland was unappealing, and emigration sounded like the way to go. Walsh had job offers from all over the United Kingdom, but chose to accept a much riskier endeavor in Ames, Iowa.

One major factor in Walsh's decision was his uncle and godfather, **Michael Grimes**, who attended Iowa State back when it was originally called "Iowa State College of Agriculture and Mechanical Arts." Also a native of Ireland, he was drawn to what would become Iowa State for its offer of the first doctoral program in dairy bacteriology. Grimes completed his doctorate in 1923 and returned to Ireland, maintaining close ties with his colleagues in the states.

So, when Walsh was offered a research assistantship in the nuclear engineering

program at Iowa State University, his uncle strongly encouraged him to accept it. Before long, Walsh was on a plane headed to the Midwest.

"I arrived with an immigrant visa, like so many others in the 1960s, and was astonished at the size and quality of the university campus in Ames."

Around the time of Walsh's arrival, Iowa State was playing a significant role in developing advanced materials

for the US nuclear weapons program. The campus was chosen to house a high security laboratory of the US Atomic Energy Commission and

Walsh was made an associate of that lab.

"The prospects of nuclear war were real and it appeared that I had suddenly been catapulted from an Irish backwater towards the epicenter of US nuclear conflict."

At the time, Dr. **Glen Murphy** was head of the nuclear engineering department at Iowa State, and his work ethic was of great inspiration to Walsh. Iowa Power and Light was considering the construction of a nuclear power plant and they sought Murphy's guidance and support for the project. This turned out to play a large role in Walsh's course of study. His position as a research assistant in the department allowed him the unique opportunity to work closely with Murphy, determining the economic feasibility of nuclear power for the state of Iowa.

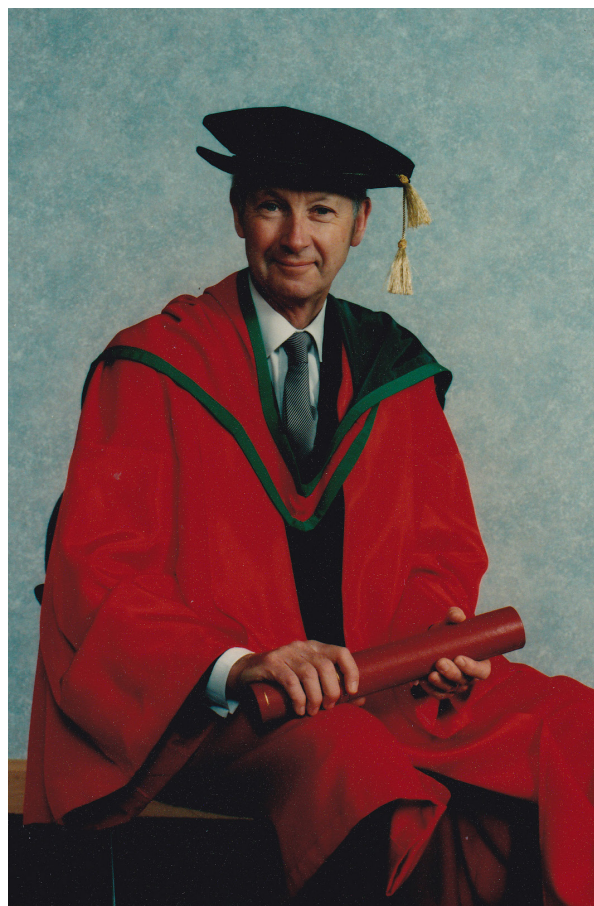
Later, Walsh transferred to the electrical engineering department to pursue his doctorate degree with Dr. **Aziz Fouad**, who joined the faculty at Iowa State in 1960 as an assistant professor. Walsh looks back fondly on the time he spent working with Fouad and **Warren B. Boast**, noting what a pleasure it was to work with such a dynamic and committed individuals.

"Boast was head of the department at the time, and he was a remarkable leader," said Walsh. "He was a gentle and civilized individual who helped build the electrical engineering department into a major department of high national and international standing."

Walsh experienced great success in the electrical engineering department and it came as little surprise when Boast eventually offered him a teaching assistantship. Walsh was fascinated with problem solving, and he even chose to conduct his doctorate thesis on the topic of thermionic energy conversion, which is the direct production of electric power from heat by the emission of electrons.

"The space program was underway and there was growing interest in the use of small nuclear reactors in space," said Walsh. "They were playing around with the idea of using direct energy conversions to provide an electrical power supply."

Below
Walsh in full academic regalia. Circa 1997
Courtesy of Edward Walsh



Pictured

Edward Walsh on his
sailboat. Circa 2012
Courtesy: Edward Walsh



Surrounded by great minds in the field of science and engineering, Walsh says one of the most exceptional individuals he encountered while in Ames was **H.D. Hughes**, a retired professor of Agronomy.

"I had the good fortune of renting the upper portion of his house, getting to know him and discovering what a remarkable individual he was," said Walsh. "He was responsible for revolutionizing US agriculture through his research work, commencing in 1912, to develop and introduce hybrid corn."

But according to Walsh, it was not the visionary research or outstanding academic work that made Hughes stand out from the crowd. Instead, it was his qualities and character as an individual. To this day, Hughes still represents a role model who has had a profound influence on Walsh's life.

"Apart from the remarkable academic environment, both intellectually and physically, my abiding memories of Iowa State University relate to the quality of the people I had the good fortune to encounter," said Walsh.

After a short, yet successful teaching career in the United States, and after establishing a small family of his own, Walsh decided it was time to make the move back to Ireland. In 1969 Walsh applied for the director position of a new, proposed institute of higher education in Limerick.

"The government decided to establish the institute as a response to a campaign that had ebbed and flowed since 1845 when Limerick lost out to Belfast, Cork, and Galway in the competition to get one of three new universities," said Walsh.

The new institute was promised to be something "better than a university," and was compared to other technological colleges being built across Europe, but the citizens of Limerick were not convinced. Time passed and Walsh was offered a lectureship position at University College Dublin, causing him to withdraw his application from the Limerick project.

But one day, Walsh received a telegram from the Higher Education Authority asking him to reactivate his application

for the Limerick job and come to Dublin for an interview. His immediate reaction was to refuse, though his wife Stephanie convinced him otherwise.

"To my surprise, there was no delay. The selection board was seated, waiting for my arrival. The interview took less than an hour," said Walsh. "Days later a telegram arrived offering me appointment as director of the proposed institute for higher education in Limerick."

Walsh would additionally be named chairmen of the planning board. He was just 29 at the time, and he had been put in charge of starting Ireland's new university. In the face of this daunting responsibility, Walsh remained calm. In fact, he was excited to take on this challenge and to draw from his time in the United States as inspiration for a new education system in Limerick

"If I could transfer the kind of

university systems, such as modular credits, interdisciplinary and co-operative education,

together with the focused management-style academic ethos I had experienced in Iowa and Virginia, I felt certain that the Limerick project could run rings around the traditional Irish universities," said Walsh.

He went to work right away, organizing the best team of risk takers he could find to get the job done. Despite funding issues and numerous controversies, the Limerick National Institute of Higher Education was opened in 1972. In the beginning the college employed 12 faculty members, admitted a mere 113 students, and housed only five degree programs.

The challenges continued over the years, but Walsh's commitment was unwavering. In 1989 the name was officially changed to the University of Limerick, and today there are over 17,000 students enrolled.

"Very few people get the chance to get a university going," said Walsh. "It gives you an interesting insight into what makes human nature tick."

Although Walsh resigned as president of the university in 1998, he is no less busy. He still continues to serve his community through active involvement

He was just 29 at the time, and he had been put in charge of starting Ireland's new university



UPSTART FRIENDS, FOES AND FOUNDING A UNIVERSITY ED WALSH

"Ed Walsh is one of the most dynamic, challenging and inspiring figures in Irish public life. His story is utterly compelling." Fintian O'Toole

Upstart: Friends, Foes and Founding a University. Collins Press, Cork, Ireland. 2011.

Walsh on Upstart:

"The book describes the struggle, in the face of opposition from the academic and religious 'old boys' clubs, to establish the University of Limerick: the first new university in the Republic of Ireland. With funding secured from the World Bank and the European Investment Bank and academic programmes modeled on those at Iowa State and Virginia Tech graduates from the new university assumed leadership roles in transforming Ireland into one of the fastest growing high-tech economies in Europe. Some 12,000 students are now enrolled, of whom 2,000 are international, in over 70 undergraduate and graduate programmes. A new medical school was established recently."

Upstart: Friends, Foes and Founding a University, the memoir of Edward Walsh, can be purchased in hardcover and kindle versions through Amazon.com

on a number of committees and advisory boards, and in 2012 he published his memoir "Upstart: Friends, Foes and Founding a University."

Walsh is living proof that with commitment, ambition, and hard work, anything is possible.

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The ECpE Addition in
the Fall