CONNECTIONS

SPRING SEMESTER 2014

BIOENGINEERING AND LU

ECpE's **Meng Lu** is Improving Biotechnology and Furthering Disease Prevention.

IOWA STATE UNIVERSITY
Department of Electrical and Computer Engineering

www.ece.iastate.edu

Learn Invent **Impact**

Greetings from Iowa State. Another academic year has come to a close and another class of graduates has left campus and gone out into the world as engineers.

Student success remains one of our top priorities, and ECpE students at all levels are showcasing their successes. Much of this issue of Connections is dedicated to their honors; from **Tyler Uhlenkamp** earning a KPCB Fellowship (Page 6) to **Cimone Wright** winning one of six statewide Alliant Energy/Errol B. Davis Jr Achievement Awards (Page 11). Our students continue to succeed in and out of the classroom.

Our faculty continue to garner awards and are being recognized as innovators by their professional associations. **Jiming Song** (Opposite page) was named a Fellow of the IEEE for contributions to algorithms in computational electromagnetics. **Doug Jacobson** (Page 2) was named a Distinguished Member of the Association for Computing Machinery (ACM). He was honored, with just three other recipients nationwide, for career achievements as an educator.

The videowall in Coover Hall's East Entrance, which has earned us a good deal of attention from around campus, entered its third phase this semester. In addition to new content and a fresh design, the videowall was renamed the **Union Pacific Multimedia Wall** (Page 3) as a result of a partnership between the department and Union Pacific. Funds from this partnership will support student projects for the wall, the first of which - featuring a campus map, an air hockey game, and social media apps, among other components - were completed this semester and are on display now.

The continued success of students and faculty is a source of pride for the department. This issue outlines just a few of those successes. I hope you enjoy it.

Best regards,

David Jiles

David C. Jiles
Anson Marston Distinguished Professor, and
 Palmer Endowed Department Chair
Department of Electrical and Computer Engineering

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AUGUST 25
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SONG NAMED IEEE FELLOW

BY MICHAEL STILL

Jiming Song, associate professor in the Department of Electrical and Computer Engineering, has been elected as a Fellow of the Institute of Electrical and Electronics Engineers (IEEE) for his contributions to algorithms in computational electromagnetics.

"This is an important career achievement for me," said Song. "Computational electromagnetics has wide applications in antenna design, radio frequency integrated circuits, non-destructive evaluation, and more. Fast and efficient algorithms will accelerate design and simulations, and use fewer computer resources, such as memory. This allows us to model large complicated structures on PCs and workstations."

Song received his bachelor's and master's degrees in physics from Nanjing University, China, in 1983 and 1988, respectively. He earned a Ph.D. in electrical engineering from Michigan State University in 1993.

In 2002, Song joined the Department of Electrical and Computer Engineering at Iowa State. His research has dealt with modeling and simulations of interconnects on lossy silicon and RF components, wave scattering using fast algorithms, wave propagation in metamaterials, and transient electromagnetic fields. He has co-edited one book and published seven book chapters, 51 journal papers and 137 conference papers.

Jiming Song
Associate Professor

Song received the NSF Career Award in 2006 and the Excellent Academic Award from Michigan State University in 1992. He was selected as a National Research Council/Air Force Summer Faculty Fellow in 2004 and 2005.

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. c
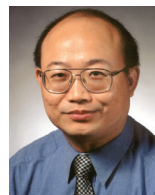
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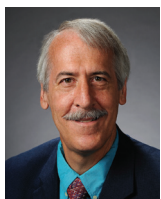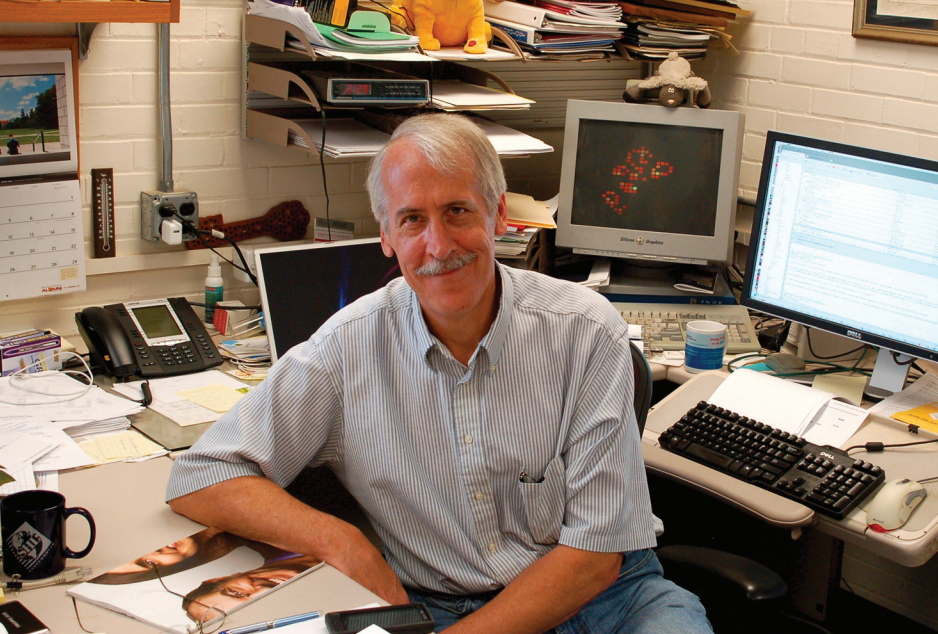
Doug Jacobson
University Professor

JACOBSON NAMED AN ACM DISTINGUISHED EDUCATOR

Doug Jacobson, University Professor in the Department of Electrical and Computer Engineering, recently was named a Distinguished Member of the Association for Computing Machinery (ACM). He was honored, along with three other recipients in the educator category, for his accomplishments and career achievements.

"To be named a distinguished educator by a group of my peers in the area of computing is quite an honor, even more so given that only 4 people were selected this year in educator category," Jacobson said.

When he's not working in the classroom, Jacobson serves as the director of the Iowa State University Information Assurance Center, which has been recognized by the National Security Agency as a charter Center of Academic Excellence. He also is the founder of Palisade Systems, a security company in Ames.

Jacobson also runs the Internet-Scale Event and Attack Generation Environment (ISEAGE). The project is an internet test bed used to test security with the goal of providing a world-class research and education facility to enhance the current state of the art in information assurance.

"This honor also reflects well on Iowa State and ECpE since, in part, it recognizes the high quality of our cybersecurity program and its many educational and outreach activities," said Jacobson. **c**

ECpE WINS $1 MILLION GRANT FOR SOIL SUSTAINABILITY STUDY

An Iowa State University research team has won a $1 million grant from the National Science Foundation (NSF) to develop underground wireless sensors that could help farmers improve crop production and reduce field runoff.

Ratnesh Kumar
Professor

The grant will fund a research team headed by **Ratnesh Kumar**, professor of electrical and computer engineering. Working with electrical engineers and agronomists, he is developing an integrated system that uses sensors buried in the soil to relay data to a central computer that would record information for researchers or farmers.

"Our new CyberSEES grant will allow continuing progress towards the goal of cyber-enabled sustainable agriculture through inter-disciplinary research involving sensor electronics, antenna design for underground placement, nano-scale technologies for sensing and energy-harvesting, and computing and networking science," said Kumar.

The sensors could help researchers understand how water moves through a field to reduce runoff, and assist in the development of better models to predict crop growth and yield. The sensors could also reveal the carbon and nitrogen cycles within soils. **c** *Courtesy Iowa State News Services*

Department

Students

Alumni

Above
Rick Holmes (left), Assistant Vice-President of System Engineering at Union Pacific, presents a check to David C. Jiles (right)

UP-WORTHY

ECpE, Union Pacific announce naming rights, content partnership for multimedia wall.

BY BROCK ASCHER

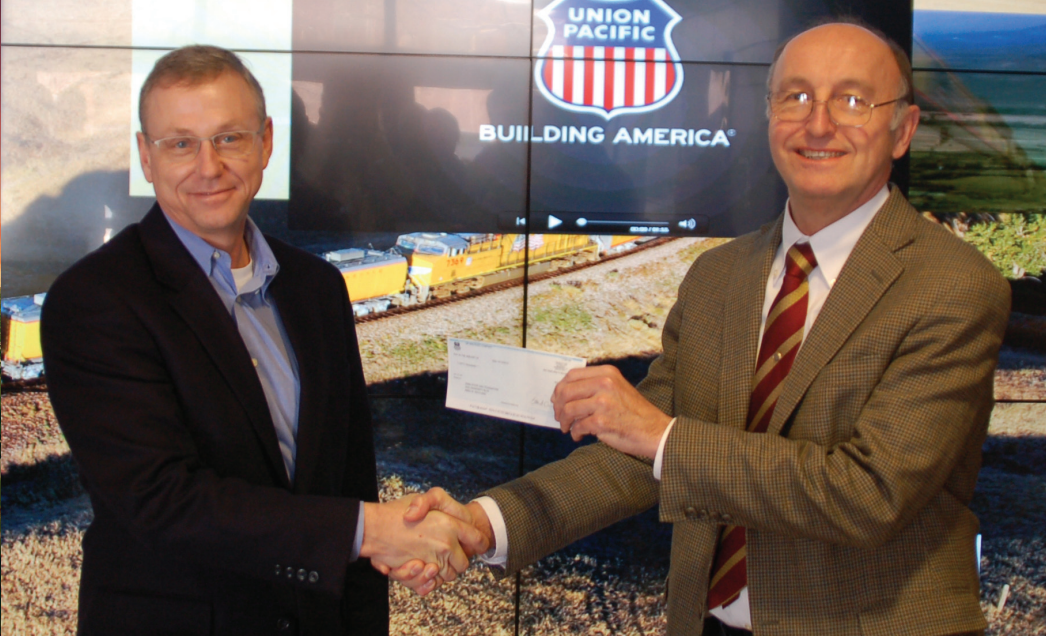The Department of Electrical and Computer Engineering announced a $150,000 partnership with Union Pacific that includes the naming rights to the multimedia wall in Coover Hall's East entrance. The wall was renamed as the Union Pacific Multimedia Wall during a small ceremony on Feb. 12 that included representatives from both Union Pacific and ECpE.

"In this difficult funding climate, corporate partnerships have become more important to us than ever," said **David C. Jiles**, Anson Marston Distinguished Professor and ECpE's Palmer Endowed Department Chair. "The department is proud to partner with Union Pacific."

Rick Holmes, Assistant Vice-President of System Engineering at Union Pacific, presented the department with a check.

"When Dr. Jiles approached us to sponsor this wall, I couldn't say yes fast enough," said Holmes. "This is an excellent branding opportunity for Union Pacific."

The partnership will provide the department with resources that will aid student learning and student involvement with the project. In addition, Union Pacific and ECpE will produce collaborative content for the space.

"The UP Multimedia Wall represents electrical, computer, and software engineering in one facility," Jiles said. "We're giving students the opportunity to do creative work, create interesting applications, and dream up many potential uses. Partnering with Union Pacific helps us facilitate these goals." **c**

With it's newly-installed 4K video capabilities, the UP Multimedia Wall can host a number of big-screen attractions, including Iowa State men's basketball games. Future screenings are in the planning stages.

DEPARTMENT HEADLINES

ECpE RANKED BY U.S. NEWS AND WORLD REPORT

ECpE's graduate programs were ranked among the best institutions in the nation this March by U.S. News and World Report. The computer engineering program ranked 35th overall, including 21st among public schools, while the electrical engineering program ranked 41st overall, including 25th among public institutions.

ECpE HOSTS NATIONAL CYBER DEFENSE COMPETITION

ECpE hosted the annual Cyber Defense Competition in the Transformative Learning Area this past February. The spring CDC was designed to challenge experienced cyber defense teams and welcomed teams from Northern Iowa, Kansas State, Depaul, among other colleges and universities.

IOWA STATE PART OF $320 MILLION NATIONAL MANUFACTURING LAB ANNOUNCED BY WHITE HOUSE

Iowa State University is a top-tier partner in a new Digital Lab for Manufacturing to be based in Chicago with affiliated partners across the country. The Digital Lab is designed to be the country's flagship research institute for digital manufacturing and design innovation. the Center for e-Design, the Virtual Reality Applications Center and the Center for Nondestructive Evaluation are primarily involved in the project.

MORE ONLINE
Keep up with the latest news online
www.ece.iastate.edu

BIOENGINEERING AND LU

BY MICHAEL STILL

Meng Lu's
numerous projects have the aim of improving biotechnology and furthering disease prevention.

Meng Lu
Assistant Professor

"What interests me most, is fostering innovative research projects that directly respond to the challenges set by commercial demands," explained **Meng Lu**, assistant professor at Iowa State University with a joint appointment in the Department of Electrical and Computer Engineering and the Department of Mechanical Engineering.

Lu graduated from the University of Illinois and received his Ph.D. in 2008. After that, he spent three years as a research scientist at a startup company marketing a biosensing technology that could analyze the binding affinities and kinetics of biomolecules. But all that time, there was something that Lu missed about being around school.

"I always believed that academia provides extraordinary opportunities to pursue exciting science and broaden the impact of technology through the education of students," said Lu.

Then, in 2012, Lu's wife was offered a teaching position at Iowa State. When she accepted, Lu was fortunate enough to be offered a position as an assistant professor, and he found himself back in the classroom, ready to share his passion for learning.

"When I walked through the buildings and saw the laboratories, I was excited," said Lu. "I explored the facilities on campus and decided that Iowa State is the place where I wanted to work."

Today, Lu leads a research group of six graduate students in actively developing optical sensors for various applications, including chemical and biomolecule sensing, microscopy imaging, and soil analysis.

The group's vision in exploring biophotonics lies at studying the intersection of biological and micro/nano scale systems through a wide variety of optical phenomena.

"For example," explained Lu, "one of our research projects aims at developing a new immunosensing technology that allows people to hear the biomolecules."

To do this, Lu's team is working working in collaboration with Dr. **John McClelland** in the Ames Laboratory to apply the photoacoustic spectroscopy for measurement of disease biomarkers.

"If successfully developed, our technology will result in a point-of-care testing system that can rapidly diagnose infections, allergies, cardiovascular diseases, and even cancers," said Lu.

Graduate student and member of Lu's team, **Yunfei Zhao**, is working on designing the signal transducer, prototyping the compact read-out system, and developing the immunoassay for hepatitis. With Zhao's efforts, Lu hopes that their research will benefit home healthcare by providing an affordable and portable solution for early diagnosis of diseases.

In the past, Lu has worked on a number of research projects and covered many different topics, ranging from computational electromagnetics to microplasma light emitters and laser-based sensors.

"My favorite research project to date is an external cavity laser (ECL) sensor that was demonstrated as an optical signal transducer to perform very challenging detection of small molecules, like drugs," said Lu.

Lu also mentioned that while at Illinois, he was part of a team that built a state-of-the-art narrowband laser using a semiconductor optical amplifier. It was then applied to detect tiny changes induced by the absorption of biomolecules.

Back to his team at Iowa State, Lu identified their traditional strengths as being in the area of new optical nanostructures and micro/nano fabrication.

"We have performed experiments with which we study the basic characteristics of nanophotonics and nonfluidics," said Lu. "Our goal is exploring the nanoscale interface between photonics and fluidics, and using that information to develop new sensing mechanisms."

Lu is working with this young, energetic research group to develop the next generation of technology that will solve challenging problems in the areas of life science, agriculture, the environment, and sustainable energy.

At the end of the day, Lu has found a way to combine his love for innovative research and his passion for broadening the impact of technology through the education of students.

UHLENKAMP NAMED A KPCB FELLOW

BY BROCK ASCHER

Tyler Uhlenkamp, a junior software engineering major, was named an Engineering Fellow by Kleiner Perkins Caufield & Byers this semester. Uhlenkamp will intern with Coursera, an online startup that offers massive open online courses (MOOCs) as part of his fellowship this summer.

The KPCB Fellowship Program, which matches outstanding students with internship opportunities within its partner firms, put Uhlenkamp together with Coursera after Uhlenkamp expressed an nterest in the online company

"After the initial round of interviews, they gave me twenty or so companies and asked which one I was interested in," Uhlenkamp said. "I interviewed with a number of companies, got offers from a few of them, and accepted the offer from Corcera."

Uhlenkamp will live in Mountain View, Calif. and will be employed at Coursera over the course of the summer. He will be tasked with working with the company's engineers on its website.

"Javascript is what I like," Uhlenkamp said. "It's in high demand right now because the web is moving toward more javascript-heavy applications. This is what I talked to a lot of the companies about."

Uhlenkamp applied for the fellowship last December after hearing about the program at the MHacks event in Omaha. Through the application process, Uhlenkamp participated in a coding challenge to give the firm a better idea of his coding skills. Following that, it was on to the interviews.

"Through the fellowship, I had 10 or 15 interviews," he said. "I interviewed with Flipboard in the first round, and then from that point it split into four different branches of companies that I could work for."

KPCB contacted him early this year to let him know he had been selected as one of 56 nationwide fellows. Nearly 2,500 applicants from more than 200 universities applied through the program.

"I was pretty excited," Uhlenkamp said of the offer. "It was just an email from the recruiters at Corcera. I didn't know that it was a big deal – I just thought I had gotten another offer – until some friends out in California called to tell me congratulations."

The KPCB Fellows Program, now in its third year, offers outstanding students from across the country an opportunity to gain significant experience working on uniquely challenging technical, design and product problems while also developing new relationships that are meaningful to their careers. In addition, fellows attend private events hosted by portfolio companies where they meet engineers and designers from across Silicon Valley. ■

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.

Name: _____   Graduation year(s) and degree(s): _____

Address: _____   City: _____

State: _____   Zip code: _____

Country: _____   E-mail address: _____

Home phone: _____   Business phone: _____

News I'd like to share: _____

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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.

I'd like to support:

Electrical/Computer Engineering Excellence Fund
  ❑ $1,000   ❑ $500   ❑ $250   ❑ Other $ _____

ECpE Coover Hall Building Project
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Credit card number: _____   Name as shown on credit card: _____

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Thank You!

Mailing Instructions: Detach this form along the perforated edge. Fold the form in thirds so that the ECpE address shows on the outside. Tape the form closed and place your stamp in the labeled box. If you're mailing a check, remember to completely seal the edges of the form or send the form along with your check in a standard envelope.

IT-OLYMPICS HELD AT HILTON COLISEUM

The IT-Olympics were held April 25 and 26 at Hilton Coliseum. High school students from all across the state of Iowa converged on Hilton Coliseum for the two-day celebration of information technology.

The IT-Olympics is the capstone event for students who participate in IT-Adventures - a program dedicated to increasing interest in and awareness of technology among high school students. Students learn through four content areas: Cyber defense, game design programming, robotics, and multimedia.

This year's event was the largest ever, with nearly 700 students from 55 Iowa high schools. The event is free and open to the public and features workshops and classes for high school teachers, in addition to its student-focused components.

In addition to their own projects, high school students had a chance to demo a few ECpE student projects, including the Oculus Rift/Webcam project shown at left.

ECpE STUDENTS EARN NSF GRADUATE RESEARCH FELLOWSHIPS

BY MICHAEL STILL

The National Science Foundation's Graduate Research Fellowship Program (GRFP) was started in 1952 to ensure the vitality of the human resource base of science and engineering in the United States. Today, this program continues to recognize and support outstanding graduates in NSF-supported science, technology, engineering, and mathematics disciplines.

Iowa State University students **Riley Brien**, a senior in electrical engineering, and **Stephen March**, a recent graduate of the same program have both been selected to join this prestigious program. **Joshua Straqaudine**, senior in electrical engineering, was given an honorable mention.

For these three students, the application began relatively the same way. Whether or not they had previously considered applying, they all mentioned that **Sumit Chaudhary**, Director of Student Professional Development and associate professor in the Department of Electrical and Computer Engineering, was a guiding force through the process.

"My adviser mentioned the fellowship program, but said it may be difficult to win without any journal publications," said Brien. "Dr. Chaudhary really encouraged and inspired me to apply regardless."

Applications open in the early fall and close in November, giving applicants plenty of time to prepare their materials while also battling the pressures of a new semester. In addition to the general application form, students are asked to submit a personal statement, a research proposal, and three letters of recommendation.

"I spent a majority of my time on the personal statement and research proposal," said March. "The personal statement is difficult to write, because each applicant must summarize their background, reasons for pursuing grad school, and how grad school will allow the applicant to have a broader impact on the community."

The research proposal component can be difficult and take some time, because each applicant must come up with an original research project that is reasonably tied to their background. For this reason, applicants who have a balanced, well rounded background tend to be selected into the program. In fact, there is an entire "broader impacts" section of the application that asks how you can use your education to benefit society.

"The NSF fellowship is not for students who spend their existence in a

> "Candidates need both scholarship and philanthropy in their background to be serious contenders for this award."

research lab or in a classroom getting a 4.0," said March. "Candidates need both scholarship and philanthropy in their background to be serious contenders for this award."

Brien, March, and Straquadine credit the opportunities and experiences offered at Iowa State University in helping to develop that well-balanced background.

"While at Iowa State, I've had loads of opportunities to get involved in activities, such as marching band, engineering clubs, and honors societies," said Straquadine. "These opportunities all helped me become a much more well-rounded person and helped tremendously in the "broader impacts" section of my application.

In addition to generous research funding and financial assistance for graduate school, students involved in the Graduate Research Fellowship Program have many advantages when looking toward the future.

"The GRFP is one of the most prestigious and competitive funding opportunities available for graduate students," said Straquadine. "Under these fellowships, you basically bring your own funding with you wherever you go, so it really opens doors for you at grad school." c

Above
From left: Stephen March, Riley Brien, Joshua Straqaudine

WYMORE WINS STUDENT POSTER COMPETITION

BY MICHAEL STILL

As Iowa continues to prove itself as a national leader in wind energy production, college students across the state are working to expand on what is one of the fastest growing source of electricity production in the world.

One Iowa State University student, **Mathew Wymore**, recently was awarded first prize for his research display presentation at the 2014 Iowa Wind Power Conference, held in Ankeny earlier this year.

Wymore is a first-year Ph.D. student studying

Below
Mathew Whymore displays his first-place award with his poster.
Photo by Iowa State University Wind Energy Initiative

ticked on, and in the end, it was time that posed the biggest challenge to success.

"I actually wound up with only two days to put the poster together," said Wymore. "But, I dealt with that conflict by reshuffling my priorities and making a late night, or should I say early morning, visit to Perkins."

The diner dash worked to his advantage, and Wymore turned out an impressive research display that won him first place recognition at the conference.

"The poster was a summary of the high-level research I've been doing on the current state of health monitoring for wind turbines and the challenges faced for monitoring each of the major turbine components," said Wymore. "It's a combination of reviewing the work of others in this field and analyzing the problem with the help of my major professors."

Although his research was a big part of what won him first place, Wymore recognizes that the collaborative nature of the WESEP program and his theatre background helped provide necessary communication skills that helped his presentation.

When asked about his

Wind Energy Science, Engineering, and Policy (WESEP). This interdisciplinary graduate program serves to produce technical experts, responsible communicators, and ethical decision-makers who will lead the nation toward meeting national goals in the use of wind energy to reduce climate impacts, while contributing to U.S. economic competitiveness.

The research display competition, which was sponsored by Exelon, was first brought to Wymore's attention by his major professors, **Daji Qiao** of ECpE and **Halil Ceylan** of CCEE, who emailed him about the contest, urging him to participate.

"They thought I should submit a poster," said Wymore, "and I thought it sounded like a good opportunity as well, so I took it."

With nothing more than a size restriction and a few other technical guidelines for construction, Wymore began working on his display. The clock

plans for the future, Wymore said he wants to stay involved with the wind energy industry in Iowa, which is thriving now more than ever.
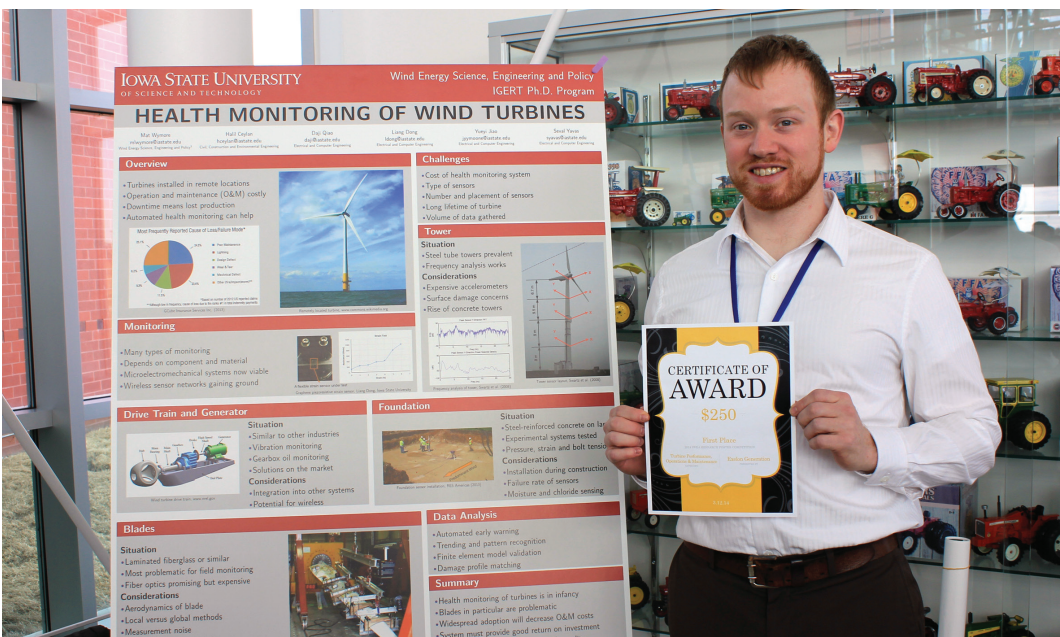
According to the American Wind Energy Association, Iowa boasts the highest percentage of electricity generated by wind energy. With an impressive 27.4%, Iowa has proven itself as a national leader in wind energy production, and thanks to its central location and convenient access to major navigable rivers and the national interstate highway system, our state is likely to remain at the industry's forefront.

Wymore encourages students to check out ISU's WESEP program, and offers a few words of advice to those interested in wind energy related education opportunities:

"Keep proactively looking for opportunities, then you'll always find yourself with more than two days to prepare!" c

Department

Students

Alumni

WRIGHT SELECTED FOR ALLIANT ENERGY/ ERROLL B. DAVIS JR. ACHIEVEMENT AWARD

BY BROCK ASCHER

Senior computer engineering major **Cimone Wright** was one of six statewide winners of this year's Alliant Energy/Erroll B. Davis Jr. Achievement Award. The awards will be presented at the Diversity Catalyst Award Reception, Tuesday, April 15 at the University of Iowa Memorial Union.

Wright, who was encouraged to apply by **LeQuetia Ancar**, Iowa State's Multicultural Liaison Officer, will be presented with a $4,500 scholarship at the ceremony.

"I was sent an email by Dr. Ancar," Wright says. "She said the scholarship fit my goals. She's kind of my mentor and has been for my entire college career. I looked into it, applied, and I got it."

To be considered for an Alliant Energy/Erroll B. Davis Jr. Achievement Award, a student must be a senior business or engineering major at a Regent university, be a member of an underrepresented group, and receive two letters of support from faculty members or advisers.

"I was very excited when the announcement came in the mail," Wright says. "The first thing I did when I found the letter was say 'Yeah, I didn't get it. This is too thin.' You think of it like a college application – if it's not thick, you think you didn't get it."

After graduation, Wright will pursue a Ph.D. in human-computer interaction. She has logged research hours with Tien Nguyen and Morris Chang, both associate professors in the Department of Electrical and Computer Engineering.

"We're seeing too many issues where we think what we're doing is geared toward the user, and then we give it to the user and he says 'What does this even do?'" Wright says. "At that point, we've basically failed. That's a major problem, especially since the world is gearing more and more toward technology, specifically touch technology."

In addition to her research goals, Wright has been very active in STEM education outreach, specifically to African Americans.

"Some things I want to do in my career involve helping African Americans to be aware of the statistics of where we're at in college," says Wright. "One of my goals is to increase the number of African Americans in college, and specifically to increase the number of African Americans in STEM fields."

Wright's outreach activities take her to a variety of schools – but not just high schools. The senior says she prefers to speak in front of younger crowds

Above
Cimone Wright outside of the Walter W. Wilson Jr. Lab on the second floor of the ECpE Addition

in order to make an earlier impact.

"I prefer to speak to students when they're really young because that's when they're impressionable. That's when you can make a difference," she says. "When they're at the high school level, they've probably already made up their minds. It's not impossible to reach them, but it is more difficult."

Wright's outreach activities correlate with the goals of the Alliant Energy/Erroll B. Davis Jr. Achievement Award, which was created by Alliant Energy to honor Erroll B. Davis, Jr. and his nearly 30 years of service to the utility industry. The award seeks to honor and recognize the importance of scholarship and leadership by underrepresented minority students in the state of Iowa. c

CAPITAL ALUM

ECpE Alum **Vivek Mehra** worked at Apple, founded Cobalt Networks, and now funds startups through August Capital.

BY MICHAEL STILL

Vivek Mehra
(MSCprE '88)
Founder, Adaptive
Sound Techologies, Inc

Vivek Mehra grew up in Chandigarh, India, a beautiful city lying at the foothills of the Himalayan Mountains. Chandigarh serves as the capital of the states Punjab and Haryana, and when it was built in 1950's, the city was internationally known for its urban planning and modern architecture.

"It is a very modern town by Indian standards," said Mehra. "With a large number of government employees, a major university, and the premier medical college in India, it had one of the highest literacy rates in India."

Mehra also said that the large number of highly educated professionals in the area certainly impressed on him the value of education. This love for learning blossomed, and Mehra became very interested in building and conducting experiments. He even had his own mini workshop where he and his friends would spend hours working on new scientific ventures.

"A friend of mine in middle school gave me this book of electronics projects, and although they were very simple, we really enjoyed building them," said Mehra. "Over the years, as we got older, my friend and I began to dive into more interesting and complex projects."

Because computers were very expensive and difficult to obtain in the 1970's and 1980's, Mehra's interest in computing did not come until later. However, he did follow his love for electronics and technology when he chose to attend Punjab University after graduating from high school 1982.

"Punjab University did not offer a computer science or computer engineering undergraduate degree," said Mehra, "but luckily, the electronics degree offered supplemental courses in computer science and engineering. This is why I believed it was the best course of study for me." As his undergraduate years came to a close, Mehra made the decision to further his education by attending graduate school in the United States. He said that as his interest in computers grew, so did his interest in building things. This prompted Mehra to seek a program that covered both computer hardware and software. After looking through a number of college brochures, he eventually chose to enroll at Iowa State University.

"Frankly, I didn't know exactly what to expect," said Mehra.

College tours were far too expensive, and before coming to Iowa, Vivek had never been to the United States. His father had told him stories of the few times he had traveled to the US, but that, along with movie and television depictions, was his only exposure to this new culture.

"I didn't know anyone in Ames, so I packed what I thought I'd need and landed in Des Moines with only two bags," said Mehra. "It took me about a week or so to find an apartment, but within a few weeks I was pretty set. It was a big change, but the workload at school kept me quite busy."

While pursuing his master's degree in computer engineering, Mehra had the chance to work on exciting new projects with talented people. His thesis advisor was **Arthur Pohm**, Anson Marston Distinguished Professor, who served as a mentor and guiding force in Mehra's research.

Department

Students

Alumni

"My graduate project was to improve signal detection in magneto-resistive memories. I also did an independent study in high speed memory bus design, which I didn't realize at that time was going to be an increasingly important topic as computers increased in speed," said Mehra.

After graduating from Iowa State in 1988, Mehra moved on to see what the world had to offer him. As it turned out, he learned that he actually had something big to offer the world. In 1996, he and a group of his friends and colleagues started Cobalt Networks, a company that provides server appliances to enable organizations to establish an online presence.

"I worked at Apple for about five years, and it was fun work but came with very intense, long hours," said Mehra. "A number of us in our group felt that if we were to work this hard we might as well work for ourselves."

Mehra and his co-founders spent about six months working on a number of different ideas before converging on their final decision. They raised some money from friends and family, assembled a small core team and started working.

"Getting early employees to join was not easy," said Mehra. "We were asking them to leave well paid jobs and join this unproven startup. Fortunately, after spending time with us and hearing our vision, a few brave folks jumped aboard."

Mehra initially served as the Vice President of Engineering at Cobalt, meaning he was responsible for the design and implementation of the hardware and software operations. As Cobalt grew into a worldwide company, he also took on the responsibility of product marketing and was eventually named Chief Technology Officer.

Cobalt went public on NASDAQ in 1999 with an impressive IPO, and only one year later, the company was acquired by Sun Microsystems, a multinational vendor of computers, computer software and hardware, and information technology services.

MEHRA VISITS ECpE

Vivek Mehra visited Iowa State on April 4 and spoke to a full crowd of ECpE students in 3043. Following his seminar, titled *Reflections on Innovation and Entrepreneurial Thinking*, Mehra held a meeting with the ECpE Entrepreneurial Club.

"Inviting successful alumni to return to campus to speak with our students is one of the most important things we can do for our students," said **Manimaran Govindarasu**, associate chair and Mehl Professor in the ECpE department. "Vivek Mehra's visit was incredibly beneficial."

Mehra spoke to ECpE students about his time at Apple, forming the idea that eventually became Cobalt Networks, and his experience within the current startup culture.

"A number of us in our group felt that if we were to work this hard we might as well work for ourselves."

This new ownership meant new challenges for Cobalt Networks. Mehra was transitioned from CTO to general manager for the business unit, where his new responsibilities included sales, marketing, and finance.

"It was not easy transition for the company," said Mehra, "as we were used to running quite independently, but now had additional rules to live under."

In 2003, Mehra started a new job at August Capital. The company, founded in 1995, is a venture firm that invests in startup companies differentiated by technical innovation and entrepreneurial excellence. At August Capital, Mehra works to identify interesting startups, and once the company invests, he works with the founders and teams to hopefully build large successful companies.

"I typically take one or two business meetings with entrepreneurs each day. These entrepreneurs typically are experts in their domain so it is great to hear about their ideas," said Mehra. "The meetings tend to be very interactive as we try to get a good feel for the team and the idea."

Mehra spends a lot of time conducting research on companies in which he is considering investing. He also will work with existing portfolio companies to review their plans, participate in board meetings, and help them in recruiting.

"It is a very risky business with well above-average returns if you do your job well," said Mehra. "That also means, however, that a lot of our companies unfortunately will not succeed. Venture capitalists often spend a lot of time being a coach or counselor, working with the founders and CEOs the through thick and thin."

When asked what inspires him, Mehra explained that he enjoys watching entrepreneurs take on large businesses with their new, innovative products and ideas. In fact, one of his career highlights has been starting Cobalt Networks and watching it grow to serve so many people. Now through his work at August Capital, he is living vicariously through others, sharing his passion for building and learning with the companies he invests in.

"I've always believed that you should pursue what you enjoy doing," said Mehra. "If you do what you enjoy, you do it well. And if you do it well, you'll be rewarded." ◼

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Roy Mattson
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Faculty, University of
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ECpE MOURNS LOSS OF DISTINGUISHED ALUM

Roy Henry Mattson (PhDEE '60), distinguished ECpE alum of Tucson, Ariz., died Aug. 29, 2013, at Mercy Hospital in Anoka, Minn. He was 85.

Mattson enlisted in the United States Navy after graduating from Chisholm High School in 1945. Following an honorable discharge in 1947, Mattson attended the University of Minnesota, where he earned a bachelor's degree and a master of science degree in electrical engineering. He accepted a position at Bell Laboratories and lived in New Jersey prior to returning to the Midwest to earn a PhD in electrical engineering from Iowa State in 1960.

Soon after, Mattson became a professor at the University of Minnesota and served in that position for five years. In 1965, Mattson became head of the electrical engineering department at the University of Arizona. He was employed at Arizona for 22 years and accepted a position at National Technological University in Fort Collins, Colo., upon retirement.

Mattson held several patents and wrote two engineering textbooks.