

Fall 2016

CONNECTIONS

Revolutionary RIDE

Iowa State received a \$2 million National Science Foundation grant to fund a project called RIDE, which will transform the ECpE department and how it trains a new type of workforce.



Greetings from Iowa State.

It is an exciting time in the Department of Electrical and Computer Engineering at Iowa State University: Our enrollment is growing, our researchers' work is being nationally recognized and new, innovative programs are being implemented.

In this issue of Connections, we highlight the many achievements within our department, as well as our alumni. Faculty have developed new ways to educate the young generation of engineers. This fall, Professor Julie Dickerson and a faculty team established the Predictive Plant Phenomics NSF Research Traineeship to educate graduate students on agricultural issues within engineering fields. Their unique T-training instruction model will provide students with a broad range of disciplines marketable in the science community.

The work of another faculty team was acknowledged by the NSF with a \$2 million grant. "Reinventing the Instructional and Departmental Enterprise" is a unique collaborative instructional model for course design that will transform education and develop engineers of the future. Three faculty members, Jaeyoun Kim, Long Que and Chinmay Hegde, also received national recognition for their research.

With the evident success of our faculty, our students continue to do outstanding work. Neelam Prabhu Gaunkar received the IBM Ph.D. Fellowship award in fundamental science and technology. We also feature graduate students who have exceeded expectations.

Also in this issue, alum Jim Mitchell pioneered a digital answering machine almost 30 years ago with his VEISHEA Open House project. He represents the best of the ECpE program, utilizing the opportunities of his collegiate years to progress his career to Rockwell Collins, developing new software relating to aircraft and satellite communication.

Honored faculty member Jim Nilsson's renowned textbook contributions to the field and warm teaching style leave a legacy within the ECpE Department that will not be forgotten. Nilsson, a 1958 Ph.D. graduate and Anson Marston Distinguished Professor Emeritus, passed away late last year, but his impact on Iowa State remains prevalent in our memories.

Finally, I would like to thank Professor David Jiles for his leadership during his tenure as department chair, and I wish him the best of luck as he represents Iowa State as a Jefferson Fellow and then resumes back his professorial responsibility full time.

I hope you enjoy this fall issue of Connections.

Manimaran Govindarasu

Mehl Professor

Interim Department Chair

Department of Electrical and Computer Engineering

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Fall 2016

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IOWA STATE UNIVERSITY RECEIVES \$2 MILLION NATIONAL SCIENCE FOUNDATION GRANT

BY ANN WILSON

Students at Iowa State University majoring in electrical and computer engineering will greatly benefit from a new \$2 million grant from the National Science Foundation (NSF) to create a unique collaborative instructional model for course design that will transform their education and develop the next generation of engineers.

Electrical and computer engineering technologies have evolved from simple electronics and computing devices to complex systems that profoundly change the world in which we live. Designing these complex systems requires a new way of thinking, including the development of social, professional and ethical responsibility. The project being funded – “Reinventing the Instructional and Departmental Enterprise (RIDE)” – will transform the electrical and computer engineering department and the way it trains a new type of workforce.

The changes will be driven by RIDE’s cross-functional, collaborative instructional model for course design and will lead to different department structures and a more agile environment able to respond quickly to industry and social needs – and ultimately serve as a model for electrical and computer engineering departments across the country. Another impact of the RIDE project will be broadening the participation of underrepresented students, especially undergraduate women, in the field of electrical and computer engineering. Project activities will emphasize inclusive teaching practices and learning experiences.

Faculty from four colleges at Iowa State will play a role in the RIDE initiative, including serving as project leaders, course instructors, facilitators and researchers. This collaboration between the Colleges of Engineering, Human Sciences, Design and Liberal Arts and Sciences lends university-wide expertise and complementary perspectives. The interdisciplinary instructional model for course development will promote design and

systems thinking, professional skills such as leadership and inclusion, contextual concepts and creative technologies. The diverse RIDE project team will bring various backgrounds, perspectives and skills to the project.

David C. Jiles, former chair of the electrical and computer engineering department, is the principal investigator of the RIDE project. In this role, he serves as the overall project manager. “The way we educate future engineers is continuously evolving,” Jiles said. “Technology and systems are changing faster than ever, and this new model of education will enhance the success of our students, the future engineering leaders who will address our greatest challenges and use advances in technology to make a difference in our world.”

The RIDE project will begin this summer by developing strategies for managing change processes. During the first year, the project strategies will get underway, and by the second year, new versions of selected courses will be piloted. The electrical and computer engineering department will be continually developing and refining department and curricular practices.

The National Science Foundation, based in Virginia, is an independent federal agency that supports fundamental research and education across all fields of science and engineering. In 2016, the NSF has made six awards across the country to support revolutionizing engineering departments, an NSF activity known as “RED.” The RED goal is to help universities transform department structures, policies, practices and curricula to enable ground-breaking changes in undergraduate engineering education. The \$2 million award to Iowa State is the only one given to an electrical and computer engineering department.

“Significant time and investment is needed to create lasting change throughout an entire department,” Jiles said. “We are excited to develop new

models of undergraduate education at Iowa State and be a leader in addressing the priorities and societal grand challenges facing the electrical and computer engineering professions.”

The Iowa State College of Engineering has the seventh largest undergraduate enrollment in the country. The college ranks third nationally in computer engineering degrees awarded and 14th in electrical engineering degrees awarded. ■

RIDE project team members include:

- **Brian Burt**, education
- **Lora Leigh Chrystal**, program for Women in Science and Engineering
- **Kristen Constant**, department chair, materials science and engineering
- **Doug Jacobson**, electrical and computer engineering
- **David C. Jiles**, electrical and computer engineering
- **Phillip Jones**, electrical and computer engineering
- **Mari Kemis**, education
- **Lisa Larson**, psychology
- **Mani Mina**, electrical and computer engineering
- **Sarah Rajala**, dean, college of engineering
- **Sarah Rodriguez**, education
- **Diane Rover**, electrical and computer engineering
- **Mack Shelley**, political science
- **Seda Yilmaz**, industrial design
- **Joe Zambreno**, electrical and computer engineering



JILES LOOKS BACK ON TIME AS DEPARTMENT CHAIR

BY DAVID JILES

David Jiles, Palmer Endowed Chair of the Department of Electrical and Computer Engineering at Iowa State, has been selected as a Jefferson Science Fellow as a scientific adviser to the Department of State. Here, he reflects on his position as department chair as he begins his fellowship this fall.

This letter will be my last to our alumni as I step down from being department chair. It has been an interesting and challenging time over the last six years, during which the department has seen many changes and made enormous progress on many fronts. Thinking back to those days in 2010, we had 950 undergraduate students, of which less than 100 were in software engineering. Today, we have over 2,000 undergraduates, of which over 500 are in software engineering. Furthermore, ECpE continues to have the largest graduate program in the College of Engineering with 380 graduate students.

The department has been fortunate to have a dedicated and talented group of faculty who were always ready to “step up to the plate” when needed, because while the number of students has doubled, the number of faculty has remained more or less the same. So the workload for individual faculty members is larger now than it was then.

In 2010, the department had a narrow portfolio of funded research and was heavily dependent on the National Science Foundation. Today, it has a much wider range of sponsored research, both government and non-government, and research expenditures have grown consistently above the rate of inflation. In the last year, it has been wonderful to see several of our faculty deservedly win multi-million dollar research grants.

In terms of external professional recognition, the department now has 19 IEEE Fellows, which means 40-percent of our faculty are fellows — an enormous achievement.

Among the new facilities added in the last six years are: The Union Pacific multimedia screen (project CYris), the Transformative Learning Area, the Student Services Center, the Electronics Technology Group facilities and the Robert and Ruth Brayton Conference Center. These have resulted in improved physical facilities, despite the continuing lack of space in Durham and Coover.

To sum up, I found my time as department chair to be very busy but personally very rewarding, too, and I want to express my thanks to many of my faculty colleagues who have made my time as chair such a very agreeable experience. ■

DISCOVERY HELPS CANCER PREVENTION

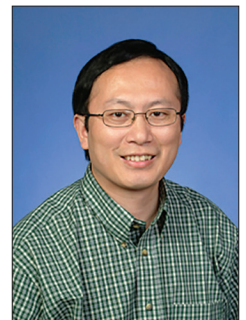
BY EMILY BENDA

Prostate Cancer (PC) is the second most common cancer and the sixth leading cause of cancer death among men worldwide. ECpE's **Dr. Long Que** and his laboratory have created a chip that may help combat this prominent illness.

Que's laboratory recently developed an optofluidic chip-based diagnostic system. This type of chip offers 50-100 fold more sensitivity compared with the traditional ELISA for detecting biomarkers, such as prostate-specific antigen (PSA) and neuroendocrine marker (NEM) for prostate cancer (PC).

By testing clinic samples using this type of chip, along with the assistance of Que's collaborator Dr. Girsh Shah, it appears that combined NEM+PSA tests can significantly improve reliability of PC detection and reduce the number of diagnostic biopsies.

This type of chip not only can be made disposable, thereby avoiding any possible cross-contamination during the test, but also can offer many advantages, such as elimination of the labeled antigen and the need of the sophisticated equipment and highly trained individuals. These advantages make the technology suitable for point-of-care application to screen elderly male populations for PC and to monitor the progress of patients undergoing PC treatment. As early detection is essential for good PC prognosis and treatment options, this chip will assist in proactive PC prevention. ■



Long Que

Associate Professor

PLANTS, PROGRESS, PEOPLE

Leaders from a variety of academic departments join to create a new traineeship addressing today's agricultural issues.

BY EMILY BENDA

Julie Dickerson, professor in the Department of Electrical and Computer Engineering, has received a New Research Trainee (NRT) award from the National Science Foundation (NSF). The \$3 million award will establish the Predictive Plant Phenomics NSF Research Traineeship and is shared with a team of researchers from around the university.

"We're excited to have this opportunity," Dickerson said. "It's an interesting team to work with and a lot of new perspectives."

The goal of the program is to change the way agricultural science works by bringing engineering concepts into the fold. Dickerson and her team hope to improve phenotype measurement in plants by supplying engineering ideas and techniques, like sensor robotics, to plant scientists.

"To make a change in the genome and have that come through, it's still more of a skill-based art, and we want to make it more into a science," Dickerson said. "What I do is I work on the informatics and apply these methods for machine learning and data analytics to plants."

Graduates accepted into the traineeship will address the major agronomic challenges of the 21st century, such as food production, and work directly with faculty to help solve these issues. The project will utilize the T-training model proposed by the American Society of Plant Biology (ASPB) to provide students with training across a broad range of disciplines while developing deep technical expertise in one area. The T-training model focuses on communication and other soft skills for researchers to promote their work to the public.

With this new program, Dickerson hopes to increase awareness and cultivate an interest in agriculture and plant

science for electrical and computer engineers.

"We really want students to understand what the problems are and what plant scientists have to deal with," Dickerson said. "A lot of the course will be having the students work in teams and will require them to communicate in each other's language. Engineers may not be expert plant biologists, but they will understand plant scientists' problems and what the real issues are."

The expertise gained from this program, combined with training in advanced communication and entrepreneurship skills, will enable graduates to work across organizational and cultural boundaries and scientific disciplines. Dickerson believes students can expand their career opportunities and be more marketable to employers with this knowledge.

"Engineers may not be expert plant biologists, but they will understand plant scientists' problems."

Team contributors come from a variety of fields within three of Iowa State's colleges: Engineering, Liberal Arts and Sciences and Agriculture and Life Sciences. Theodore Heindel (Engineering), Lie Tang (Engineering), Carolyn Lawrence-Dill (Agronomy), Patrick Schnable (Agronomy), Liang Dong (Engineering, ECpE), Baskar Ganapathysubramanian (Engineering), Dan Nettleton (Statistics) and Srikanta Tirthapura (Engineering, ECpE) all assisted Dickerson in creating the proposal.

The program began courses in the fall of 2016. 



Julie Dickerson
Professor

DEPARTMENT HEADLINES

FACULTY FEATURED IN DISCOVER MAGAZINE

Sandbulte Professor Ian Dobson was featured in Discover Magazine's March 2016 issue. Dobson's research with physicists Ben Carreras and David Newman on the risk of large blackouts is described in detail in Discover's article, "Averting the Blackout of the Century."

"We think we have a high-level approach and a model of the system that can give insight on how [power grids] regulate themselves over time," Dobson said. "We'd like to increase the detail of the simulator and deepen the validation of its results so we can anticipate problems in a particular area."

BISWAS, KIM AND STUDENTS WIN BEST STUDENT PAPER

This year's Best Student Paper Award in the Microfluidics, BioMEMS and Medical Microsystems section of SPIE Photonics West (BIOS) was presented to Rabin Dhakal, Akshit Peer, Rana Biswas and Jaeyoun Kim for their presentation, "Transfer molding processes for nanoscale patterning of poly-L-lactic acid (PLLA) films."

The goal of the team's project is to find novel bio-medical applications of periodically patterned polymeric nano-structures. Faculty members Biswas and Kim said they were grateful for the opportunity and glad to be recognized for their work.

UNIVERSITY RECOGNIZED AS "HIGHLY REGARDED CYBERSECURITY PROGRAM"

Iowa State University was recently recognized as one of the "Highly Regarded CyberSecurity Programs" on Online Engineering Programs' blog.

Iowa State was commended for its online master of science degree in information assurance, focusing largely on cybersecurity. This degree is offered 100-percent online, without ever requiring students to visit the campus.



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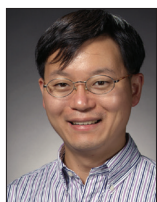


Above
Official top-100 badge
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top-100 read articles by
Scientific Reports.

NEW FRONTIERS

Jaeyoun Kim's research breaks a new front of both microrobotics and soft robotics, earning attention from the *Scientific Reports* community.

BY BROCK ASCHER and EMILY BENDA



Jaeyoun Kim
Associate Professor

The tiny tube circled an ant's thorax, gently trapping the insect and demonstrating the utility of a microrobotic tentacle developed by Iowa State University engineers.

"Most robots use two fingers, and to pick things up, they have to squeeze," said **Jaeyoun (Jay) Kim**, an Iowa State University associate professor of electrical and computer engineering and an associate of the U.S. Department of Energy's Ames Laboratory. "But these tentacles wrap around very gently."

And that makes them perfect hands and fingers for small robots designed to safely handle delicate objects.

The spiraling microrobotic tentacles are described in a research paper recently published in the journal *Scientific Reports*. Kim is the lead author. Co-authors are In-Ho Cho, an Iowa State assistant professor of civil, construction and environmental engineering; and Jungwook Paek, who recently earned his Iowa State doctorate in electrical and computer engineering and is moving to post-doctoral work at the University of Pennsylvania in Philadelphia.

The paper describes how the engineers fabricated microtubes just eight millimeters long and less than a hundredth of an inch wide. They're made from PDMS,

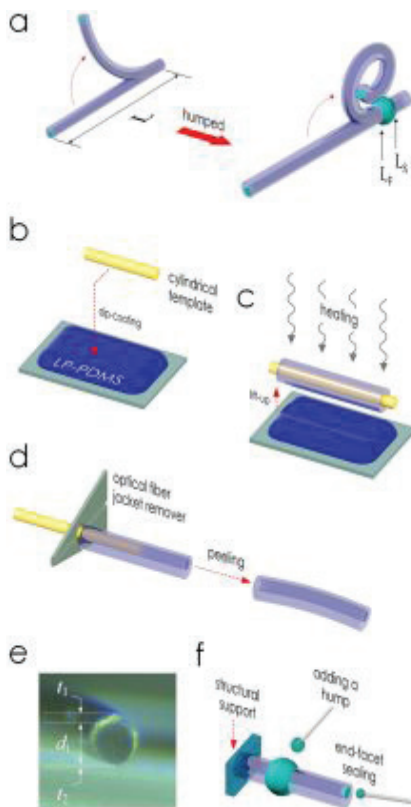
a transparent elastomer that can be a liquid or a soft, rubbery solid. Kim, whose research focus is micro-electro-mechanical systems, has worked with the material for about a decade and has patented a process for making thin wires from it.

The paper also describes how the researchers sealed one end of the tube and pumped air in and out. The air pressure and the microtube's asymmetrical wall thickness created a circular bend. They further describe how they added a small lump of PDMS to the base of the tube to amplify the bend and create a two-turn spiraling, coiling action.

And that's just what the engineers wanted.

"Spiraling tentacles are widely utilized in nature for grabbing and squeezing objects," the engineers wrote in the paper. "There have been continuous soft-robotic efforts to mimic them... but the lifelike, multi-turn spiraling motion has been reproduced only by centimeter-scale tentacles so far. At millimeter and sub-millimeter scales, they could bend only up to a single turn."

It took a lot of problem solving to create the extra turn in the microrobotic tentacles. "Yes, we scratched our heads a lot," Kim said.



The engineers had to develop new production techniques to create the microtubes. They had to figure out how to peel the microtubes off a production template. And they had to use computer modeling to find a way to create more coiling.

Kim said the resulting microrobotic tentacle is “S-cubed – soft, safe and small.” He said that makes it ideal for medical applications because the microrobotic tentacles can’t damage tissues or blood vessels.

The current study was supported by Kim’s six-year, \$400,000 Faculty Early Career Development Award from the National Science Foundation.

The paper placed as one of the top-100 read *Scientific Reports* articles in 2015, of almost 11,000 papers published.

Kim said he and his co-authors, Cho and Paek, are proud of their accomplishments and grateful Iowa State University provides such a supportive environment for research.

“We were feeling uncertain and insecure with our paper because it described a new concept with which neither the authors nor the readers were

LEFT
Infographic describing PDMS microtube tentacle actuator and its fabrication through dip-coating the cylindrical template, heating the template and peeling off the cured PDMS microtube.

familiar,” Kim said. “The large number of views gave us confidence in our work and its potential.”

Kim said the project is a nice combination of two new trends in robotics.

“There’s microrobotics, where people want to make robots smaller and smaller. And there’s soft robotics, where people don’t want to make robots out of iron and steel. This project is an overlap of both of those fields. I want to pioneer new work in the field with both microscale and soft robotics.” **c**

IBM FELLOWSHIP AWARD

BY EMILY BENDA



Neelam Prabhu Gaunkar, ECpE Ph.D. student, recently received the IBM Ph.D. Fellowship award in the fundamental science and technology category.

The IBM Fellowship award is an internationally competitive award given to excellent Ph.D. students who have an interest in solving problems that are important to IBM and fundamental to innovation in various areas of study.

Prabhu Gaunkar’s research investigates the applicability of nuclear magnetic resonance (NMR) by improving and building novel sensor systems that acquire reliable datasets non-invasively. What makes her work different is perhaps the fact that unlike conventional NMR systems, she wants to use a single-sided NMR system for imaging purposes. The single-sided system has a limited field of vision but is very portable. The main challenge lies in improving acquired image resolution, and for this Prabhu Gaunkar plans to combine signals from an array of transmit/receive coils and control the magnetic field gradients.

In order to receive the IBM Fellowship award, candidates must be nominated by both the department chair and their adviser. In Prabhu Gaunkar’s case, that person was Dr. David C. Jiles.

“I am delighted to hear that Neelam has been awarded an IBM Fellowship,” Jiles said. “The IBM Fellowships are prestigious and highly sought-after. Winning this fellowship is testimony to the achievements that she has already made in both research and education.” **c**

ECpE CALENDAR

NOVEMBER 21-25
Thanksgiving Break

NOVEMBER 24-25
University Holiday
Offices Closed

DECEMBER 12-16
Final Exams

DECEMBER 17
Commencement

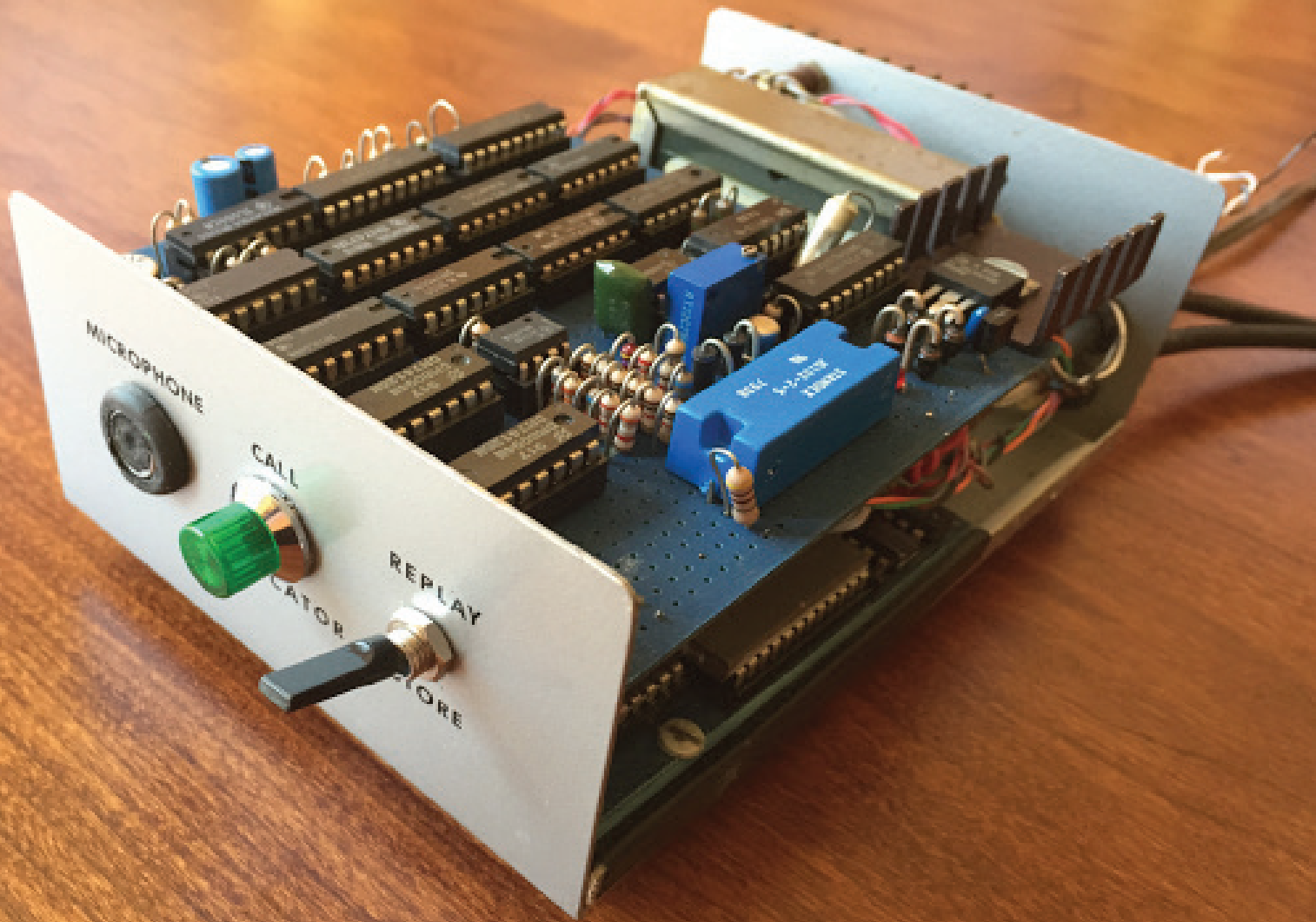
DECEMBER 23-26
University Holiday
Offices Closed

JANUARY 9
Spring semester begins

JANUARY 16
University Holiday
Offices Closed



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Innovation Calling

James Mitchell invented what may have been the first digital phone answering machine at his VEISHEA Open House project presentation in 1982.



James Mitchell
(EE '82)
Rockwell Collins

BY EMILY BENDA

ECpE alum James Mitchell P.E. (EE '82) created a digital outgoing telephone message machine during his time at Iowa State, which may have been the first of its kind in the world.

Mitchell displayed a working prototype of the digital outgoing message with a taped incoming system at the Iowa State University VEISHEA Engineering Open House in April 1982. Using 35 integrated circuits (16 memory chips) and the digital and analog experience from his courses, Mitchell created his

project in just three weeks.

"I saw the open house as an opportunity," Mitchell said. "I wanted to do something as profound as I could possibly do." He added that he had to develop his own Analog to Digital converter and encoding process, as these were not readily available commodities during that time.

The project won a Gold award, the highest of the three levels, from David T. Stephenson, faculty advisor, and J.O. Kopplin,

the department chair of the time.

In Mitchell's award letter, Stephenson and Kopplin state that his phone-answering system was "a particularly interesting exhibit for the many visitors who have some knowledge of digital techniques and who have

"I wanted to do something as profound as I could possibly do."


ever found themselves 'talking to a machine.'"

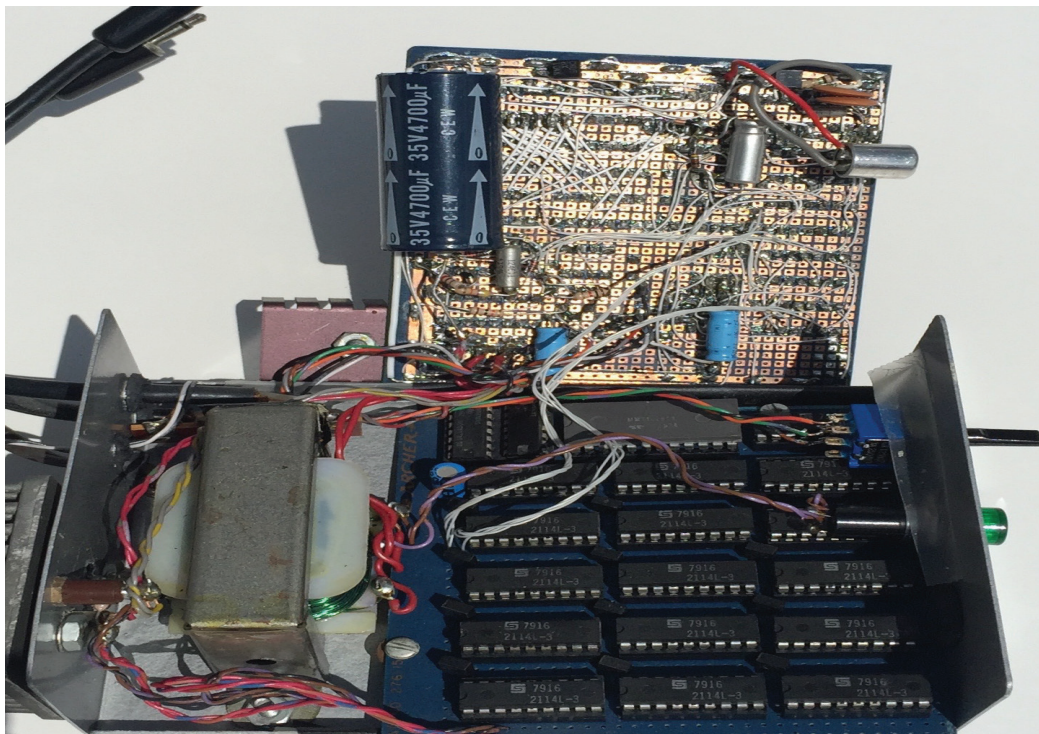
Mitchell credits the VEISHEA Open House with helping him receive his position at Rockwell Collins after graduation. He was offered the job after his VEISHEA

demonstration and continued to stay with Rockwell Collins for the next 33 years until retiring last December.

Although Kazou Hashimoto holds the patent for a digital answering machine, he did not invent the machine until 1983, a year after Mitchell's presentation of his digital answering machine.

Mitchell may also hold the title for the first created LED television display in 1977. His monochromatic model was displayed at the International Science and Engineering Fair (ISEF) expo in Anaheim, Ca., in 1978 and won awards from NASA, General Motors Corporation and Westinghouse.

Currently, Mitchell holds 40 patents with another 12 pending, the majority related to aircraft and satellite communication. He lives in Cedar Rapids with his wife. 



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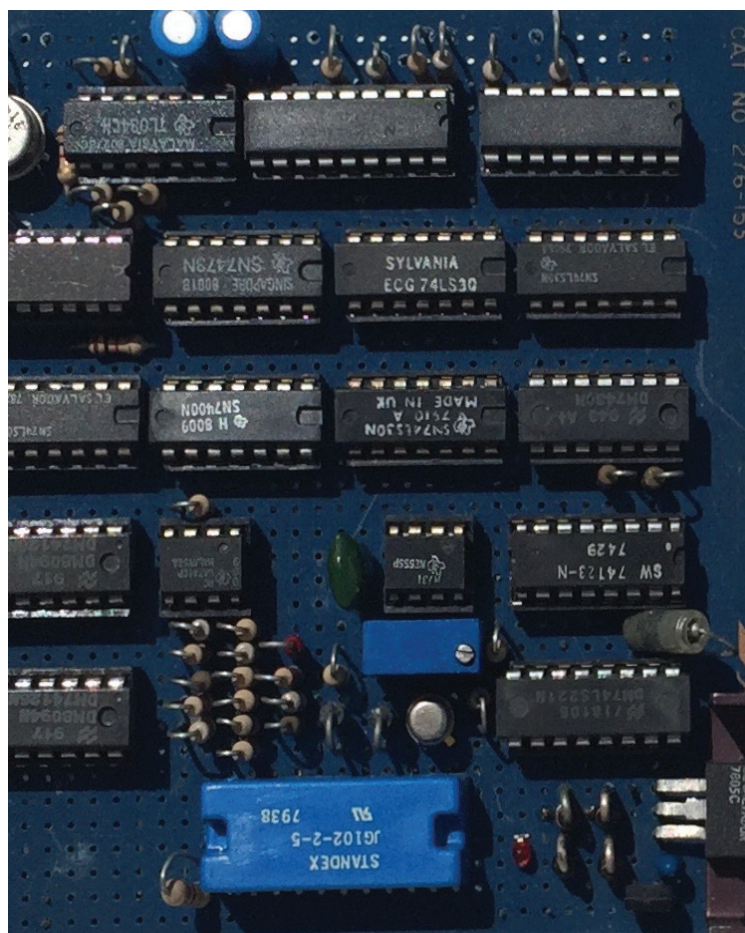
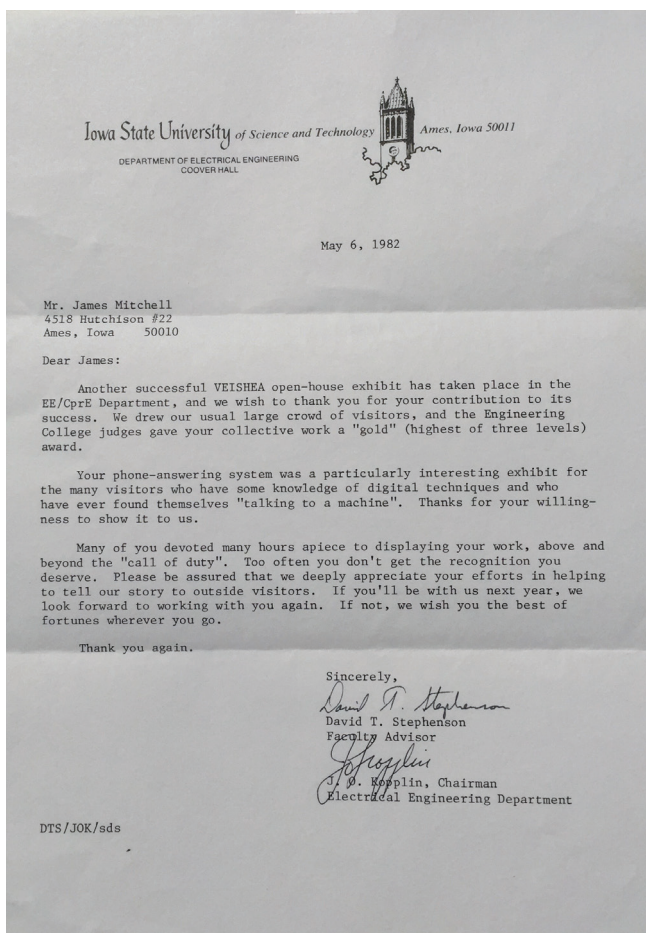
Inside Mitchell's phone answering machine project.

Below

Mitchell's award letter signed by Stephenson and Kopplin for his VEISHEA Open House project.

Below

Mitchell's audio board within his phone answering machine.





Above
Hegde works with his
graduate student on
algorithm design.

NEW FACULTY IS NATIONALLY RECOGNIZED

Assistant professor wins \$175,000 award during his first year at Iowa State.

BY EMILY BENDA



Chinmay Hegde
Assistant Professor

Assistant professor Chinmay Hegde has been making strides in his first year at Iowa State since he joined the ECpE faculty last August.


In April, Hegde received a CRII (CISE Research Initiation Initiative) Award worth \$175,000 from the National Science Foundation (NSF). This is a relatively new program under the Computer and Information Science and Engineering (CISE) Directorate at NSF, and it is geared toward early-career faculty within their first two years of a tenure-track position.

The CRII award program is part of CISE's strategy to increase its investments in the growth of the research capabilities of future generations of computer and information scientists and engineers. This award provides opportunities for early-career researchers to recruit and mentor their first graduate students and lead to research independence with following projects and publications.

"It is a great honor," Hegde said. "I appreciate the ECpE Department for their support and helping me kickstart a successful career in academia."

Hegde already has made his own head start. He recently was invited to give a talk at the International Conference on Signal Processing and Communications, where he presented the paper, "A Fast Algorithm for Demixing Signals with Structured Sparsity." This work builds upon his earlier paper on designing scalable algorithms for graph-structured data acquisition and inference, which appeared in the International Conference on Machine Learning (ICML) in 2015.

Hegde says the CRII Award will support his research in developing fast algorithmic techniques for acquisition and processing of structured data. Hegde's goal is to create algorithms that are fast, scalable and able to last in the quickly-changing world of technology.

"We want algorithms that are 'future-proof' and will work ten to twenty years down the line. It seems to be a compelling problem, and that's my motivation for looking into this," Hegde said. 

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

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ECpE Coover Hall Building Project

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- ☐ laboratories and classroom space
- ☐ ECpE Coover Hall Building Project

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RESEARCH EXCELLENCE AWARD WINNERS

Awards are given to graduate students who are near graduation and go above and beyond within their research area.

Fall 2015



Eeshita Manna

Eeshita is a first author on three publications, one of which is in a Conference Proceedings. Overall, she has six publications and at least one in preparation, related to the fabrication and characterization of OLEDs and other organic electronics.



Hung Nguyen

His research interests include program analysis, web applications, symbolic execution and variability-aware analysis. Of Hung's 23 publications, 19 were published at top-tier conferences (ICSE, FSE and ASE). These publications have received 242 citations and an h-index of eight.



Magesh Paramasivam

Magesh proposed a systematic dynamic optimization based approach to handle large scale power system dimensionality. He developed a vector parameterization based (CVP) approach, where optimization is separated from the dynamic simulation of power systems.



Mehran Samiee Esfahani

As a part of his research, Mehran measured the defect density in organic solar cells and perovskite solar cells in two publications. The impact is that defect densities in the solar cell control the device characteristics and explain the device behavior that cannot be understood otherwise by just current voltage measurements.



Sneha Aman Singh

Her major work involves designing and building software systems for processing continuous "big data" streams. The novelty of Sneha's work is it tracks such global functions over the union of data streams seen at multiple nodes without sending all the data to a central place.



Li Xu

Li has 12 papers published in the Analog-to-Digital Converters testing area. Li has written and presented excellent papers at other venues, such as the 2013 IEEE International Instrumentation and Measurement Technology Conference (I2MTC) and the 2015 IEEE VLSI Test Symposium (VTS).

Spring 2016



Anh Nguyen

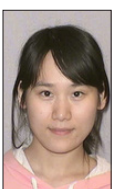
Anh's research interests include mining software data, automated software engineering, statistical language processing and more. He has published about five papers per year with 388 citation counts and an h-index of nine.



Yan Ni

Yan is currently working on magnetic sensors based on magnetoelectric multiferroics and topological insulators. Her goal is to develop high-performance magnetic devices with the potential for a wide range of applications, including in write/read heads of disc drives in data storage and ultrahigh sensitivity Hall effect sensor.

Summer 2016



Teng Wang

Teng's work is significantly different from what is conventional in the computer vision field. Instead of focusing solely on algorithmic improvements, her work involves fusing radar data with image sensor data to detect humans moving in noisy (e.g. dust, smoke) environments.

TEACHING EXCELLENCE AWARD WINNERS

Awards are given to graduate students who are near graduation and have shown dedication to their undergraduate students.

Fall 2015



Wanning Li

Spring 2016



Cory Kleinheksel



Above
The Braytons cut the ribbon
to open the new conference
room in Coover Hall.

BRAYTON CONFERENCE ROOM OPENED

Brayton family donation makes new conference room possible.

BY EMILY BENDA

Coover Hall unveiled the new Brayton Conference Room this summer on June 27.

The conference room is named after distinguished alum Bob Brayton. Bob and his wife, Ruth, donated the funds to make the conference room possible and have remained dedicated friends of Iowa State and ECpE since Bob graduated in 1956 with a bachelor's degree in electrical engineering.

During his career, Bob published 10 books and more than 450 papers in the areas of the analysis of nonlinear networks, simulation and optimization of electrical circuits, logic synthesis and formal design verification. Bob is a member of the National Academy of Engineering, a Fellow of the Institute of Electrical and Electronics Engineers, Iowa State Outstanding Alumnus and a winner of the Anson Marston Medal from Iowa State's College of Engineering.

Bob attended the ribbon cutting of the

conference room with his family and friends on June 27. Remarks were made by Dr. David C. Jiles on behalf of ECpE and Dr. Gary Mirka on behalf of the College of Engineering. Bob and Ruth also thanked the audience and Iowa State for being such a positive influence on their family.

The new Brayton Conference Room serves students, faculty and staff as a premiere location for presentations and meetings. Its state-of-the-art technology gives the department a modern advantage for communications and gatherings. **■**

ECpE MOURNS THE LOSS OF JIM NILSSON

BY BROCK ASCHER AND EMILY BENDA

Beloved ECpE faculty member passed away this past December. Nilsson is remembered for his widely used textbook, "Electric Circuits."

James W. Nilsson, Anson Marston Distinguished Professor Emeritus for the Iowa State Department of Electrical and Computer Engineering, passed away Dec. 26, 2015, at Green Hills Health Care Center. He was 91.

Nilsson, one of the most prominent and celebrated teachers in ECpE annals, earned his bachelor's degree at the University of Iowa (1948) and his master's (1952) and Ph.D. (1958) at Iowa State. He joined the ISU faculty as an instructor in 1948 and was promoted to associate professor (1952), professor (1962) and Anson Marston Distinguished Professor (1984).

"His contributions to the department through the years were enormous," David C. Jiles, former Palmer Endowed Department Chair of ECpE and Anson Marston Distinguished Professor, said. "The department's legacy as an educator of successful engineers was built by faculty like Jim Nilsson."

Nilsson was elected a Fellow of the Institute of Electrical and Electronics Engineers (IEEE) in 1990 and earned the IEEE undergraduate teaching award for inspirational teaching in 1992. Nilsson won the student vote for ECpE's annual professor of the year award five times. No other faculty member has won more than twice.

"He was everyone's favorite teacher," Thomas Scott, associate professor emeritus of ECpE, said. "He contracted exams which were so clearly fair that, when he gave a student a low grade, the student just accepted it."

Scott also recalls Nilsson's uncanny accuracy in front of a classroom.

"In that era, we wrote on chalkboards. He covered the board time after time without ever needing to make a correction. That was amazing."

Nilsson wrote several electrical and computer engineering textbooks, including "Electric Circuits" (1983), which gained worldwide acceptance and use. The fourth edition of "Electric Circuits" earned Nilsson an award for outstanding contributions to publisher, Addison-Wesley, one of the world's leading technical publishing houses. While the book has evolved to meet diverse learning styles, the underlying pedagogical approaches remain constant and relevant. The book is currently in its tenth edition.

"[He] was a superb teacher and a person of great integrity," said Arthur Pohm, Anson Marston Distinguished Professor Emeritus of ECpE. "His textbook on circuits probably brought more recognition to the

department than any other activity in the department during his tenure. If I may borrow from a movie title, he was a man for all seasons; he was a stellar faculty member who brought acclaim to Iowa State."

Nilsson will be remembered as one of the important and beloved pioneers of the ECpE Department. His students, including Richard Horton, who became a fellow faculty member upon graduation, remember him as a master teacher, a mentor and a role model who listened to his students.

Kenneth Kruempel, associate professor

"Electric Circuits" is the most widely used introductory circuits textbook of the past 25 years.



Pictured

James W. Nilsson, circa 1977
Courtesy: University Archives

emeritus and ECpE alum, has fond memories of Nilsson's receptiveness.

"He was always very open to ideas for changes, corrections and additions to the current edition of his books," Kruempel said. "I would routinely ask students in the class for their suggestions and concerns, and then give them to Jim. He would always consider them and often use them for revisions in the textbook."

Although Nilsson retired from teaching in 1987, he continued to impact those around him. To date, "Electric Circuits" has influenced the engineering education of tens of thousands of electrical engineers worldwide and is the most widely used introductory circuits textbook of the past 25 years.

Through his teaching and contributions to the field, Nilsson's legacy at Iowa State and in the field of electrical engineering will continue to be recognized for years to come. **■**

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Pictured
The ECpE Addition in
the fall