2017 Impact Report

2,489 Students Enrolled
56 Faculty
18 IEEE Fellows
$13.5 Million in Research Expenditures

IOWA STATE UNIVERSITY
Department of Electrical and Computer Engineering
The Department of Electrical and Computer Engineering at Iowa State University is steadily on the rise. In 2017, we hired seven new faculty members to join our exceptional team. Our enrollment of undergraduate and graduate students is at an all-time high, with an increase in underrepresented minorities. We have enhanced our ability to support these minority students through our $2 million RIDE grant from the National Science Foundation (NSF), which supports transforming our curriculum and broadening the participation of underrepresented students; as well as our $4 million S-STEM NSF grant, which improves diversity and creates a more inclusive environment. Our students are impacting the world around them, investigating technologies to early-diagnose diseases using nanotechnology, developing enabling technologies for precision agriculture, helping to solve the world’s energy problems through the design of a secure smart grid, training the nation on cybersecurity and traveling to Australia to race a first-ever all student-built solar utility vehicle across the continent. Through the years, our influential alumni return to campus to visit us and meet with students, giving back to the program that gave them so much. We are proud of the ways ISU ECpE is changing the world and making it a smarter and better place to live.

Palmer Department Chair
Electrical and Computer Engineering
Iowa State University
Our faculty are researching...

### Bioengineering

The department aims to be a leader in bioengineering research, by combining biology, physics, mathematics and engineering concepts to make advancements at the intersection of these disciplines.

### Cyber Infrastructure

Through projects in information assurance, cyber-physical security and high performance computing, ECpE is a national leader in cyber infrastructure research, education and industry/educational outreach.

### Data, Decisions, Networks, Autonomy

With the ever-expanding capabilities of cyber-physical systems, ECpE recognizes that data, decisions, networks and autonomy play fundamental roles in designing complex engineering systems.

### Energy Infrastructure

Through decades of experience in power grid design, renewables and numerous other projects, ECpE is internationally known for excellence in energy infrastructure research.

### Materials, Devices, Circuits

ECpE recognizes the need to more fully understand and exploit the full potential of research in materials, devices and circuits, and is committed to making advances in this area.
Students

Degrees Awarded 2016-17

Students in ECpE

90% of students have jobs within six months of graduation

Our students are studying...

Undergraduate Students

Graduate Students

*one completing certificate program
Digital Women is a student organization dedicated to encouraging, supporting and retaining women in computer science, software engineering, electrical engineering, computer engineering and Management Information Systems.

Racing across the Outback

Four ECpE students, Nathan Coonrod (EE), Lucas Ince (CprE), Jason Cheng (EE) and Jason Baldus (EE), traveled to the Australian Outback with Team PrISUm for the Bridgestone World Solar Challenge. The 3021-kilometer biennial race began on Oct. 8, 2017, in Darwin, Northern Territory Australia, and ended in Adelaide in Southern Australia on Oct. 15.

“The race was a challenge and at times very stressful, but being here in Adelaide and looking back on everything I did to make this car a possibility has been my greatest college experience,” Ince said.
ISU 1 of 7 programs in the U.S. to receive $2 million NSF RED grant

- Reinventing the Instructional and Departmental Enterprise, known as RIDE, is the new collaborative instructional model for course design and integration of professional and sociotechnical topics
- RIDE model will broaden participation in the field of electrical and computer engineering
- Project activities will emphasize design thinking and inclusive teaching practices and learning experiences in the classroom
- RIDE will serve as a model for electrical and computer engineering departments nationwide

NSF grants multimillion-dollar S-STEM award to ISU ECpE

- Provides scholarships and student experiences for diverse, academically talented students with financial need
- Awarded a $4 million grant from NSF over the next five years, with an additional $1 million to community college partners
- One curricular area is cybersecurity
- Project will perform research on how diverse students develop and sustain their engineering identities and what drives these students to persist in these programs
- One of the first multi-million dollar S-STEM awards in the United States

RIDE faculty and staff members: (L-R) Mani Mina, Mari Kemis, Ashfaq Khokhar, Diane Rover, Sarah Rodriguez, Megan Heitmann, Mack Shelley.

Ten ECpE women at Iowa State were selected to be the first cohort of students benefiting from S-STEM.
Grants awarded to Mehl Professor Manimaran Govindarasu for power grid cyber defense

- Professor Manimaran Govindarasu was awarded NSF grants to optimize power grid security and develop a realistic testbed
- Project looks at modeling, risk and contingency analysis for the power grid using game theory
- Govindarasu received a grant from the U.S. Department of Energy for preventing attacks
- Govindarasu hosted Ukrainian engineers for a study tour at ISU to learn about preventing future attacks

Assistant Professor Meng Lu receives NSF CAREER Award

- Project will develop next generation diagnostic technology using an engineered paper strip
- Has the potential to drive down the cost of the health care system
- Lu hopes to bring state-of-the-art diagnostic technology to patients’ homes in times of need

Assistant Professor Zhaoyu Wang wins seventh federal grant in two years

- Zhaoyu Wang received two NSF grants to modernize energy systems by laying the data foundation
- Wang was awarded $1.4 million from the U.S. Department of Energy for data-driven, real-time distribution grid monitoring and modeling

Research Centers

The Microelectronics Research Center (MRC) is a multi-disciplinary center focusing on the study of semiconductor materials, devices and applications. Its purpose is to bring together researchers from engineering and the basic sciences in a collaborative atmosphere to pursue fundamental and applied research in semiconductor electronics and photonics.

The Electric Power Research Center (EPRC) promotes and expands research of interest to faculty and the companies who support the center through membership. Goals include maintaining a strong electric power and energy research program and educating students at the B.S., M.S. and Ph.D. levels.

Since 2000, the Information Assurance Center (IAC) has strived to become a nationally recognized authority in information assurance research, teaching and outreach. The center is designated as a charter Center of Excellence in Information Assurance by the National Security Agency.
ISU ECpE New Faculty Hires

Andrew Bolstad, Adjunct Assistant Professor, Signal Processing and Computer Engineering

Yongxin Chen, Tenure-Track Assistant Professor, Controls

Henry Duwe, Tenure-Track Assistant Professor, Computer and Software Engineering

Cheng Huang, Tenure-Track Assistant Professor, Microelectronics and VLSI

Goce Trajcevski, Tenure-Track Associate Professor, Software Engineering

Hongwei Zhang, Associate Professor with Tenure, Computer Network Systems and Software Engineering