Chair’s Message

Simon Foo

The Department of Electrical and Computer Engineering (ECE) offers degrees in B.S. in Electrical Engineering, B.S. in Computer Engineering, M.S. in Electrical Engineering (both thesis and non-thesis options) and Ph.D. in Electrical Engineering. Both B.S. programs in Electrical Engineering and Computer Engineering are fully accredited by the Engineering Accreditation Commission of ABET.

In addition, our department also offers the 4+1 BS/MS in electrical engineering program, whereby undergraduate students can receive both BS and MS degrees by taking graduate courses in the senior year and follow-up graduate-level courses in an additional year.

The ECE faculty currently consists of 25 well-qualified, diverse, and dedicated members. The faculty support strong graduate education and research in areas such as advanced power systems, power electronics, electric vehicles and plug-in hybrid electric vehicles, electric machinery and motor drives, energy storage and conversion, renewable energy, robotics, computational intelligence, biomimetics digital signal processing, electromagnetic, optoelectronics, smart Antennas, RF/microwave circuits, superconductivity, wireless communications, computer networks, embedded systems, special purpose architectures, and intelligent transportation systems.

The ECE Department is a major contributor to the Center for Advanced Power Systems (CAPS), with 6 faculty appointments supporting this cutting-edge research center in power and energy. In addition, the Department has strong research ties with several major on-campus laboratories including the National High Magnetic Field Laboratory (NHMFL), High-Performance Materials Institute (HPMI), Aero-propulsion, Mechatronics, and Energy (AME) center, and the Institute for Energy Systems, Economics, and Sustainability (IESES).

The faculty receives federal and state funding from agencies such as the National Science Foundation (NSF), National Institute of Health (NIH), Department of Energy (DOE), Department of Transportation (DOT), Department of Defense (DOD), Office of Naval Research (ONR), and the Florida Department of Transportation (FDOT). In addition, the ECE department also receives funding from industrial sponsors including Xilinx Corporation, Lockheed Martin Corporation, Jabil, Harris Corporation, Dell Computer Company, Evans Capacitor Corporation, and the Boeing Company.

We encourage you to visit our ECE webpage www.eng.fsu.edu/ece for up-to-date information about our programs, faculty and events.

Dr. Simon Foo
ECE Department Chair

“Scientists study the world as it is; engineers create the world that has never been” ~Theodore Von Karman
Founded in 1982, the FAMU-FSU College of Engineering was established as a joint college serving Florida Agricultural and Mechanical University (FAMU) and Florida State University (FSU). The two-college model provides access to resources from both universities serving more than 2500 students, 90 faculty and the staff.

The mission of the College is to provide an innovative academic program of excellence at both the undergraduate and graduate levels and to attract and graduate a greater number of minorities and women in professional engineering, teaching and research; and to attain national and international recognition of the College through the educational and research achievements and the professional service of its faculty and students.
The Department of Electrical and Computer Engineering, at the FAMU-FSU College of Engineering, offers a bachelor’s of science (BS) degree in electrical and computer engineering, a master of science (MS) in electrical engineering, and a doctor of philosophy (PhD) degree in electrical engineering.

Electrical engineers (EE) influence all facets of modern life, especially in an age fueled by information processing, communications and the Internet. They are involved in the design, development, and implementation of a vast variety of devices, circuits, systems, and networks that are used, for example, for electrical power generation and distribution, machine and process control, terrestrial and satellite communications, computers, signal, image, and information processing, sensors, and optoelectronics.

Computer engineers (CpE) apply the hardware skills of an electrical engineer with the software skills of a computer scientist for the design and development of computing based systems. There is a wide range of computer engineering applications ranging from nano-scale integrated circuit design to the development of wide-area data networks. Electrical and computer engineers (ECE) require a strong foundation in mathematics and basic sciences. The ECE course curricula at the undergraduate and graduate levels are designed to provide students with skills they will need to develop professionally and promote lifelong learning. The department also provides the opportunity to complete coursework for all the electrical engineering degree programs at The Florida State University satellite campus located at Panama City, Florida, providing educational opportunities to engineering students in the Bay County area of Florida.

Currently, the department offers the following degree programs:

- Bachelor of Science (B.S.) in Electrical Engineering
- Bachelor of Science (B.S.) in Computer Engineering
- Master of Science (M.S.) in Electrical Engineering
- Doctor of Philosophy (Ph.D.) in Electrical Engineering
- Accelerated programs to the MSEE and PhD degrees are also available.
About the Department

Aero propulsion, Mechatronics, and Energy Center

This 60,000-square-foot state-of-the-art facility supports advanced research in aerospace and aviation, mechatronics (robotics) and sustainable energy engineering. The Aero-Propulsion, Mechatronics and Energy (AME) Center at the Florida State University focuses on the development of transformational research programs to foster cross-cutting technologies while integrating with exemplary educational and professional training programs. The synergistic assimilation of these three interdisciplinary groups of aero-propulsion, mechatronics and energy is based on the past records of these groups to build successful partnership, recent research accomplishments and the prospect of developing university-produced innovations ready to transition to commercial applications with national and global significance.

Additionally, AME Center is serving as the local hub for the FSU Southwest Campus by linking all neighboring research centers, including as NHMFL, CAPS, HPMI, IESES, ASC, through the coordination of cross-disciplinary research, educational and outreach activities.
Center for Advanced Power Systems

The Center for Advanced Power Systems (CAPS) is a multidisciplinary research center organized to perform basic and applied research to advance the field of power systems technology. CAPS emphasis is on application to electric utility, defense, and transportation, as well as, developing an education program to train the next generation of power systems engineers. The research focuses on electric power systems modeling and simulation, power electronics and machines, control systems, thermal management, high temperature superconductor characterization and electrical insulation research.

With support from the U.S. Navy, Office of Naval Research (ONR) and the U.S. Department of Energy, CAPS has established a unique test and demonstration facility with one of the largest real-time digital power systems simulators along with 5 MW AC and DC test beds for hardware in the loop simulation. The center is supported by a research team comprised of dedicated and highly skilled researchers, scientists, faculty, engineers, and students, recruited from across the globe, with strong representation from both the academic/research community and industry.
Center for Intelligent, Systems, Control, and Robotics

The vision of the Center for Intelligent Systems, Control, and Robotics (CISCOR) is to use state-of-the-art technology to develop practical solutions to problems in systems, control and robotics for applications in industry and government.

CISCOR represents a cooperative approach for conducting interdisciplinary research in the automated systems area across two departments (Mechanical and Electrical & Computer) in the College of Engineering and the FSU Department of Computer Science. The Center’s goal is to provide a means for the State of Florida to achieve national prominence in the area of automated systems and to assume a leadership role in the State of Florida’s technology of the future. Established in 2003, CISCOR has become a leading center in Florida for the development and implementation of technologies related to Intelligent Systems, Control, and Robotics.
Institute for Energy Systems, Economics, and Sustainability

The goal of the Institute for Energy Systems, Economics and Sustainability (IESES) is develop scholarship that leads to informed governance, economics and decision making for a successful Florida sustainable energy strategy.

The objectives of the Center are to:

Produce significant outcomes from research in energy conversion, transformation and innovative energy systems.

Partner with Florida’s governing bodies to develop and implement a comprehensive and sustainable energy strategic plan.

Produce scholarship based on rigorous empirical research that identifies and enables the manifestation of critical energy infrastructure that can operate in energy markets with new and more diverse range of energy suppliers.

Develop knowledge and understanding of Florida’s unique geographical challenges and their spatial solutions. These challenges include but are not limited to transportation, distributed generation, and the impact of limited water resources on all manner of energy conversion.

Provide an interdisciplinary curriculum in energy engineering, science and the sustainable energy economy, to produce the next generation of educators, engineers, scientists, policymakers and planners.

To provide analysis and up-to-date pragmatic tools to meet the challenges of our energy-constrained era.
High-Performance Materials Institute

The High-Performance Materials Institute (HPMI) is a multidisciplinary research institute at Florida State University. HPMI strives to recruit, develop and retain top quality faculty and staff who will develop HPMI into a center of excellence for research and education in the field of advanced materials. HPMI personnel established Florida’s first National Science Foundation (NSF) Industry/University Cooperative Research Center (IUCRC). In 2006, the Florida Board of Governors designated HPMI as a Center of Excellence in Advanced Materials and awarded $4 M to further HPMI’s efforts in technology transfer, economic development and workforce training. Under its cluster-hiring program, FSU has awarded the HPMI team with an additional $4 M to recruit and hire some of the nation’s top researchers in Materials. HPMI personnel recently moved into the new $20M, 45,000 square foot Materials Research Building, which houses the latest state-of-the-art equipment and facilities for materials research, especially designed for research in nanomaterials.

Leading edge, revolutionary technology comes as the result of creativity, vision, talent, dedication and teamwork. Currently, HPMI is involved in four primary technology areas: High-Performance Composite and Nanomaterials, Structural Health Monitoring, Multifunctional Nanomaterial’s Advanced Manufacturing and Process Modeling.

Over the last several years, HPMI has proven a number of technology concepts that have the potential to narrow the gap between research and practical applications of nanotube-based materials. These technologies include magnetic alignment of nanotubes, fabrication of nanotube membranes or Bucky papers, production of nanotube composites, modeling of nanotube-epoxy interaction at the molecular level, and characterization of SWNT Nano composites for mechanical properties, electrical conductivity, thermal management, radiation shielding and EMI attenuation.
National High Magnetic Field Laboratory

The National High Magnetic Field Laboratory (less formally known as the Magnet Lab) is the largest and highest-powered magnet laboratory in the world and is headquartered in a sprawling 370,000-square-foot complex near Florida State University in Tallahassee. The lab also includes sites at the Los Alamos National Laboratory in New Mexico and the University of Florida in Gainesville. Together these three institutions operate the lab, collaborating in a unique, interdisciplinary way to advance basic science, engineering and technology in the 21st century.

Established by the National Science Foundation in 1990, the lab is a national resource open to both curious visitors and world-renowned scientists. Centralizing the country’s greatest magnet-related tools, resources and expertise is not only efficient and cost-effective, but also encourages fruitful, collaborative research at the highest level. Every year, more than 1100 visiting scientists and engineers from across the world conduct experiments using our state-of-the-art equipment. Our magnets are far larger, far more powerful and far more complex than the everyday magnets most people are familiar with. Many were designed, developed and built by our magnet engineering and design team, widely recognized as the finest in the world.
Senior Design
ECE Senior Design Project robot team 1A, “Tower of Power”, led by Dr. Harvey placed 7th out of more than 40 teams at the IEEE Southeastcon Hardware Competition in Ft. Lauderdale, 2015

The ECE Department's capstone Senior Design program continues to grow and diversify, with the students in the 2014-15 program participating in 23 different projects, 17 of which have involved interdepartmental collaboration with the Mechanical and/or Industrial & Manufacturing Engineering departments. Six of this year’s projects were to prepare systems to enter in engineering competitions, seven were to support research projects, five were entrepreneurial in nature, and five were for large corporate or government sponsors. Industry and government entities contributing major sponsorship funds to this year’s projects included Harris Corporation, Efficient Systems LLC, Northrop-Grumman Corporation, FSU Utilities, National Park Service, Orchard Pond Organics, Siemens Corporation, General Capacitor, Tall Timbers Research Station & Land Conservancy, and the U.S. Air Force.

Fund-raising for Senior Design Projects and Student travel to conferences, etc.:

$50,000 grant from Northrop-Grumman to develop a Synthetic Aperture Radar system – our largest single donation!

Over $10,000 from ECE Advisory Board members and companies

$4,000 in scholarships for women engineers, starting in Fall 2015
FACULTY in the NEWS

Engineering professor elected to National Academy of Inventors

by Kathleen Haughney

A Florida State University electrical and computer engineering professor renowned for his work on energy storage materials and devices has been elected to the National Academy of Inventors (NAI).

The NAI named Professor and Sprint Eminent Scholar Chair Jianping “Jim” Zheng a fellow, an honor that has only ever been bestowed on 581 other people worldwide. “I’m very surprised and honored,” Zheng said. “This is a lifetime achievement award for innovation.” Election as an NAI fellow is a high professional distinction given to academic inventors who have demonstrated a prolific spirit of innovation. The 2015 class of fellows have had a significant impact on the economy through their innovative discoveries that have resulted in more than 5,300 U.S. patents.

Zheng alone has 15 patents, five of which have been turned into technologies that have been licensed to companies such as General Capacitor and Kim Technologies. An example of one of those technologies is a lithium-ion supercapacitor licensed to General Capacitor that is designed for rapid energy storage and delivery. It’s also been used by the Army for its radio systems. Additionally, he has worked with FSU’s High Performance Materials Institute to develop more efficient fuel cells from buckypaper, a feather-light material made from carbon nanotubes. Those fuel cells are now being used by StarMetro, Tallahassee’s bus system.

“Professor Zheng is a leader in engineering, and he is highly deserving of this award that honors his highly inventive work,” said Bruce Locke, interim dean of the Florida A&M University-Florida State University College of Engineering. “The College of Engineering is very fortunate to have Professor Zheng on the faculty where he contributes to the education of many undergraduate and graduate students through his courses and his research and commercialization activities.”

Zheng came to the College of Engineering in 1997 after serving as an electrical engineer and research scientist at the Army Research Laboratory in Wall Township, New Jersey. He also worked as a research assistant professor at the State University of New York at Buffalo, where he received his master’s and doctoral degrees.

NAI fellows were informed of their selection at the end of year and will be inducted on April 15, 2016, as part of the Fifth Annual Conference of the National Academy of Inventors at the United States Patent and Trademark Office in Alexandria, Va. Fellows will receive a special trophy, medal and rosette pin in honor of their accomplishments.

• ECE faculty Dr. Chris Edrington, recipient of the Guardian of the Flame Faculty Award from Burning Spear 2015 – the first in our Department, and possibly the first in the College too!

• ECE faculty Dr. Uwe Meyer-Baese and Dr. Petru Andrei honored at the FSU Authors’ Day, March 27, 2015. They were 2 out of 3 faculty from the College of Engineering honored at the event.
STUDENTS in the NEWS

- Thierry Kayiranga, ECE Graduate Researcher Assistant, won the Best Presentation award, Photovoltaic Session, Applied Power Electronics Conference (APEC), March 2015.

- Davis George Moye, Student Editor of the IEEE Potentials Magazine, starting January 2015.

ALUMNI in the NEWS

- Craig Nance, alumnus of the FAMU-FSU College of Engineering was selected as the Superintendent of McDonald Observatory at the University of Texas. The position involves technical leadership for telescopes, visitor center operations, education and outreach, infrastructure/utilities and much more. “Craig brings strong management experience, extensive engineering background, love of astronomy, and excellent performance in a very similar position,” at Mount Graham International Observatory, said McDonald director Dr. Taft Armandroff.

- Will Packer, movie producer, Will Packer Productions, ECE graduate.

- Dr. Gail Skofronik-Jackson is project director of the Global Precipitation Measurement program, a U.S.-Japanese scientific collaboration. Skofronik-Jackson oversees a $1.2-billion budget and a team of 200 American and Japanese scientists from the Goddard Space Flight Center in Maryland. Skofronik-Jackson graduated with a degree in electrical engineering in 1986 from FAMU-FSU College of Engineering. Skofronik-Jackson was honored at FSU’s Homecoming as one of the university’s Grads Made Good. She was the first graduate of the FAMU-FSU College of Engineering chosen as a Grad Made Good.

- Alumnus John Michael Lee Jr., Ph.D., is the new Assistant Vice President for Alumni Affairs and University Relations. Dr. Lee received his BS in Computer Engineering from ECE department, FAMU-FSU College of Engineering, in 2005.
PETRU ANDREI, Associate Professor and Graduate Coordinator, Ph.D.
University of Maryland
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RESEARCH INTERESTS: Computational electromagnetics; Modeling and simulation; Semiconductor devices; Energy storage devices; Hysteresis

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RESEARCH INTERESTS: Real-time simulation, ship electric systems, application of real-time simulation in the area of bulk power system monitoring control, smart grid and renewable energy integration.
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RESEARCH INTERESTS: Spiral coil resonators, HTS thin-film resonators. Current research projects involve development of HTS technology for use in NMR probes.

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RESEARCH INTERESTS: Computer architecture; Transactional memory; Energy-efficient microprocessors; Workload characterization

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RESEARCH INTERESTS: Electromagnetics (EM): wave propagation, computational EM, and smart antennas; Wireless communications: ad-hoc sensor networks, diversity techniques, and channel modeling

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RESEARCH INTERESTS: Power electronics, adjustable speed drives, ac motor drive systems, electric machines

ROGER D. MCGINNIS, Adjunct Professor and Director, Center for Advanced Power Systems (CAPS), Ph.D., Naval Postgraduate School in Monterrey, CA
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RESEARCH INTERESTS: Oversaw production and use of high energy lasers, high-powered microwaves and electronic launch sytems part of the future of Navy ships and aircraft.

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RESEARCH INTERESTS: Teleoperation; Robotics; Image processing

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RESEARCH INTERESTS: Circuits and systems; Intelligent transportation systems

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RESEARCH INTERESTS: Microwave and millimeter-wave measurements; Device modeling; Noise and noise temperature measurement

“Our vision is to develop ideas through study, to reach for possibilities through research, and to create an environment for graduates to be successful and develop an intellectual path to success.”
Our industry partnerships provide unlimited opportunities for our students and faculty to expand their reach worldwide.

Tianjin University of Technology (TUT)-FSU 3+1+1 BS/MS EE special program, signed May 27, 2013 – first batch of 2 students in Fall 2014, a source of tuition revenue and graduate recruitment for department. ECE department received ~$20,000 in rebate in 2015.

Federal University of Technology at Akure (FUTA) –FAMU special graduate program – 2 graduate students started in Fall 2014, expected to be a source of tuition revenue and graduate recruitment for department

Huazhong University of Science and technology (HUST), Controls Department, FSU 3+1+1 BS/MS EE special program, signed Fall 2014 – first batch of 2 students in Fall 2015, a source of tuition revenue and graduate recruitment for department.

Anhui University – FSU 3+1+1 BS/MS EE special program, signed April 2015 – first batch of 2 students in Fall 2015, a source of tuition revenue and graduate recruitment for department.

An exchange program with University of Upper Austria, was in place in 2015.

A special academic program (3+1+1) with Chandigarh University, India is in progress.