

School of Electrical Engineering and Computer Science



A new twist on an old antenna: Research transforms satellite communications

Groundbreaking innovations on antenna technology, based on a collaboration between Lockheed Martin Space and Penn State, are now under consideration for use in the next generation of GPS satellite payloads. >>

Spring 2019

FEATURES

Penn State researchers develop new technology to advance ultrasound neuromodulation

When it comes to recording and modulating neurons in the brain, neuroscientists face two options: noninvasive tools with low spatiotemporal resolution, or implantable tools that are highly invasive and can only record or impact a small percentage of the brain's neurons. Mehdi Kiani, Dorothy Quiggle Assistant Professor of Electrical Engineering, is working to change that.



Kiani, along with co-investigator Susan Trolrier-McKinstry, professor of materials science and engineering and electrical engineering, is developing a minimally invasive technology for recording and modulating neurons that would allow for unprecedented large-scale neural stimulation and recording with high spatial resolution. >>

Penn State football player and engineering student John Reid, Jr. finds success in viewing adversity as opportunity



Like most computer science and engineering seniors, John Reid, Jr. had an academically rigorous fall semester, balancing four 400-level courses immediately after his summer internship with Intel while keeping his eye on ambitious post-graduation plans. Unlike most engineering students, Reid couldn't count on weekends for extra time to get ahead on course work; for him, Saturdays were gamedays.

Most students might find the dual demands of a Division I sport and a challenging major to be too much, but Reid, a cornerback on the Penn State football team and a data science major in the School of Electrical Engineering and Computer Science, sees a natural connection between the two. >>

Researchers look for successful end to power grid failures

Nearly \$1M NSF grant enables new research on cyber-physical systems



Anyone who has experienced an extended power outage knows that the effects can go well beyond inconvenient and become outright dangerous. Luckily, with the help of a \$999,000 NSF Cyber Physical Systems grant, Nilanjan Ray Chaudhuri, assistant professor in electrical engineering and principal investigator on the project, is working to prevent failures in the power grid and enable a quick recovery when they do occur through his project, "Coupled cAscade Modeling, Prevention, and Recovery (CAMPR): When Graph Theory meets Trajectory Sensitivity."

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National experts collaborate at Penn State to ensure election security

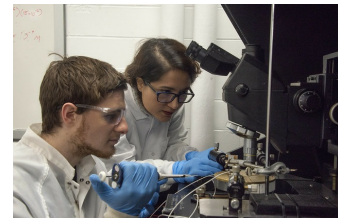
On December 3, dozens of experts from across the country met at the Penn State for the first Penn State Symposium on Election Security. The event was cohosted by the College of Engineering, Penn State Law and the School of International Affairs, as well as the Penn State Institute for Networking and Security Research and the Institute for CyberScience.



The Symposium allowed for experts from disciplines as diverse as public policy and cybersecurity to collaborate on solutions to election security threats. >>

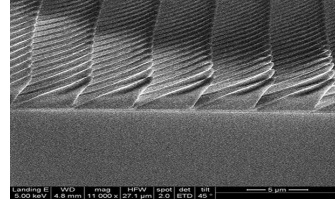
Interdisciplinary researchers join forces to understand cancer progression

A 2019 Penn State Multidisciplinary Seed Grant is enabling collaborative research that will advance our understanding of the development and progression of cancer and other diseases. The project, "eROS: In situ Mapping of Reactive Oxygen Species Produced by Cancer Cells using Integrated Sensor Arrays," is led by Aida Ebrahimi, assistant professor of electrical engineering. Ebrahimi is working closely with Esther Gomez, assistant professor of chemical engineering and biomedical engineering, and Mehdi Kiani, Dorothy Quiggle Assistant Professor of Electrical Engineering. >>



Firefly-inspired surfaces improve efficiency of LED lightbulbs

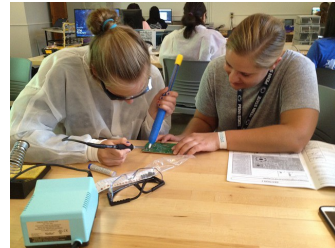
A new type of light-emitting diode lightbulb could one day light homes and reduce power bills, according to Penn State researchers who suggest that LEDs made with firefly-mimicking structures could improve efficiency.



"LED lightbulbs play a key role in clean energy," said Stuart (Shizhuo) Yin, professor of electrical engineering. "Overall commercial LED efficiency is currently only about 50 percent. One of the major concerns is how to improve the so-called light extraction efficiency of the LEDs. Our research focuses on how to get light out of the LED." >>

School of EECS to host engineering summer camps for girls

Building on last year's success, the School of Electrical Engineering and Computer Science will host two week-long summer camps designed to introduce girls to engineering.



The Anything is Possible for Girls in Electrical Engineering (APOGEE) camp will be held June 24-28 and will focus on wearable technologies. Students in this camp will learn about the electronics and signals that surround us every day, get the chance to interact and work with female electrical engineers and students and be introduced to the hands-on, Do-It-Yourself culture by actually building and creating. The Dancing with Robots Computer Science and Engineering camp will be held July 29-August 2 and will focus on big data, big ideas and big computational technology. Students in this camp will learn about artificial intelligence, machine learning and smart sensing, especially in computer vision and robotics. >>

Antireflection coating makes plastic invisible

Antireflection (AR) coatings on plastics have a multitude of practical applications, including glare reduction on eyeglasses, computer monitors and the display on your smart-phone when outdoors. Now, researchers at Penn State have developed an AR coating that improves on existing coatings to the extent that it can make transparent plastics, such as Plexiglas, virtually invisible.



"This discovery came about as we were trying to make higher-efficiency solar panels," said Chris Giebink, associate professor of electrical engineering, Penn State. "Our approach involved concentrating light onto small, high-efficiency solar cells using plastic lenses, and we needed to minimize their reflection loss." >>

Kifer, Zhang receive Outstanding Paper Award

Daniel Kifer, associate professor of computer science and engineering, and Danfeng Zhang, assistant professor of computer science and engineering, received an Outstanding Paper Award at the Conference on Computer and Communications Security (CCS) hosted by the Association for Computer Machinery (ACM). Their paper, "Toward Detecting Violations of Differential Privacy," was one of only two papers at the conference to receive this prestigious recognition. >>



- Nanyin Zhang named AIMBE fellow [>>](#)
- Jiayu Chen receives Outstanding Engineering Alumni Award [>>](#)
- Tim Kowalski receives Outstanding Engineering Alumni Award [>>](#)
- Yener named Distinguished Professor [>>](#)
- Penn State faculty named as senior members of the National Academy of Inventors [>>](#)
- Electrical engineering alumna wins Engineering Emmy Award [>>](#)
- Yener tapped to lead IEEE Information Theory Society [>>](#)
- Phillips named fall student marshal for the College of Engineering [>>](#)

In the News

Our students, alumni, faculty, and staff



UPCOMING EVENTS

May 3

College of Engineering Spring 2019 Commencement [>>](#)

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