DIGITAL GRID

Case Western Reserve and Siemens launch new program to prepare students for next-gen energy jobs.

Faced with advances in renewable energy and the threat of outages from extreme weather, our power grid is becoming more reliant than ever on intelligent, digital technologies to operate the country's most critical infrastructure.



Case Western Reserve has partnered with Siemens to launch a new academic program geared specifically toward providing students the skills they need to advance the nation's energy grid.

The academic track—within the Bachelor of Science in Engineering in Systems and Control Engineering—will consist of new classroom curriculum and hands-on learning via software and hardware tools in a state-of-the-art Digital Grid Lab.

Students will learn how to use software that helps identify outages within milliseconds—so the grid can quickly recover from damage inflicted by storms and natural disasters—and how to manage an advanced distribution management system that can balance the addition of renewables like wind and solar.

Learn more at engineering.case.edu/news/siemens-digital-grid.

SPRING/SUMMER 2019

<<<<<NEW/BIOMEDICAL/ENGINEERING ALLIANCE <<<<<



engineering.case.edu

Case Western Reserve, Cleveland Clinic partner to advance research and education.

Case Western Reserve University and Cleveland Clinic have launched a new biomedical engineering partnership, capitalizing on the respective strengths of each to advance initiatives across greater Cleveland's growing health innovation ecosystem.

The university and hospital have collaborated closely for years, and this new formal alliance pools the collective expertise of more than 50 faculty members with primary appointments in biomedical engineering at the two institutions, as well as another 80 researchers located in other Case Western Reserve departments and in the university's other medical affiliates focused on cancer, neurology, rehabilitation, cardiology, ophthalmology, orthopedics and precision medicine. The alliance represents a body of work between the two institutions of more than \$40 million in research funding per year and more than 700 patents over the past 10 years. Additionally, the alliance increases opportunities for trainees at all levels—from high school to postdoctoral education—to study with renowned scientists, physicians and engineers whose expertise ranges from nanotechnology and neural engineering to imaging and regenerative medicine.

Learn more at engineering.case.edu/news/BME-alliance.



CASE SCHOOL OF ENGINEERING CASE WESTERN RESERVE UNIVERSITY

EARLY CAREER HONORS

Burcu Gurkan and Kathryn Daltorio receive prestigious awards to advance projects.

Burcu Gurkan, assistant professor of chemical engineering (shown left), was selected to receive \$600,000 from NASA as one of 11 university-led projects that address high-priority needs for America's space program. She will use the funding to develop a system that scrubs excess carbon dioxide from the air using polymer-ionic liquid composite membranes.

Kathryn Daltorio, assistant professor of mechanical and aerospace engineering (shown right), received a 2019 Young Investigator Award from the Office of Naval Research. She was recognized among 25 recipients who will share \$16.5 million in funding to conduct naval-relevant research that benefits sailors and marines. Daltorio will use the grant to advance crab-like robots for amphibious terrain.





NEW FUNDING FOR IOTC

\$2.2M grant brings collaborative funding total to more than \$4M.

Case Western Reserve and Cleveland State universities' Internet of Things Collaborative (IoTC) has received a new \$2.2-million grant from the Cleveland Foundation. The latest funding brings the foundation's total support to more than \$4 million. The IoTC was established in 2017 to bring together industrial, governmental, educational, neighborhood and nonprofit entities in the region to harness IoT's vast potential.

Learn more at engineering.case.edu/news/loTC-grant.

\$20M challenge grant aims to create endowed professorships in engineering, medicine.

A \$20 million challenge grant from two anonymous donors will give Case Western Reserve the opportunity to establish 20 new endowed professorships in engineering and medicine. The generosity of previous contributors to the university's Forward Thinking capital campaign has provided support for 96 new endowed professorships across the campus. This new gift aims to catalyze the creation of another 10 each in engineering and medicine. Through this gift, for each dollar given to a professorship, the grant will provide an equal amount toward the \$2 million needed to create an endowed faculty position.

Learn more at engineering.case.edu/news/challenge-grant.

Reuters names Case Western Reserve among the world's most innovative universities.

Engineering researchers put assistive technology to the test in the real world.

Senior citizens can use helpful high-tech devices before they hit the market at a new living lab located within a Cleveland-area senior living facility. The Smart Living Lab at Ohio Living Breckenridge Village's Grace Wood Campus opened this fall under the direction of Case Western Reserve's Kiju Lee, the Nord Distinguished Professor in mechanical and aerospace engineering. Interdisciplinary research teams from the university's schools of engineering, nursing, applied social science and medicine will work with Breckenridge residents to experiment with emerging technology like shoe inserts that measure balance, Rubik's Cube-type devices that track cognitive function and more.

Learn more at engineering.case.edu/news/Breckenridge-lab.

ENDOWED ENGINEERING DEANSHIP

Charles H. Phipps deanship established by engineering alumnus.

Alumnus Charles H. Phipps has had a deep, personal and professional connection with the Case School of Engineering at Case Western Reserve University for more than 70 years. That relationship was recently further cemented: His \$5 million pledge in 2018 endowed the Charles H. Phipps Dean at the Case School of Engineering. The endowment will allow Venkataramanan "Ragu" Balakrishnan, new dean of the engineering school, to advance research opportunities, strategic initiatives and transformative ideas.

Learn more at engineering.case.edu/news/Phipps-deanship.

SMARTER CANCER CARE

Advanced imaging and algorithms provide new tools in the fight against lung cancer.

Medical imaging like CAT scans and MRI have been vital tools for clinicians for decades. Now, biomedical engineering researchers at Case Western Reserve University's Center for Computational Imaging and Personalized Diagnostics (CCIPD) are using deep-learning computers to extract even more information from routinely acquired medical images to improve care for a host of diseases. The team's latest breakthroughs concern the diagnosis and treatment of lung cancer. Using these high-tech tools, researchers have been able to accurately predict which lung cancer patients will benefit from chemotherapy by analyzing how the body's immune cells are arranged. They've also developed algorithms to analyze CAT scans to detect the presence of cancer outside of the tumor itself.

The center's efforts have attracted the attention—and support—of Case School of Engineering alumni Jayendra (Jay) and Harita Patel, who committed \$500,000 to the center. Their work was also named a top 10 medical breakthrough of 2018 by *Prevention Magazine*.

Learn more at engineering.case.edu/ccipd.

SUPERIOR SOLAR PANELS

DOE grant will help researchers extend the life of solar panels to half a century. A research team led by Roger French, the Kyocera Professor in the Department of Materials Science and Engineering and head of the university's SDLE Research Center, received \$1.35 million from the U.S. Department of Energy to continue boosting the efficiency and longevity of photovoltaic technology—with a specific goal of pushing its lifespan to 50 years.

Specifically, the research will compare two different kinds of module construction for encapsulating photovoltaic cells: one of double-glass construction and the other known as glass/backsheet, where the backsheet is instead a multilayer polymer laminate.

Learn more at engineering.case.edu/news/solar-50.



Sensors that can listen in could be the next step in smarter homes.

Our homes are getting smarter thanks to the Internet of Things—the vast network of wirelessly connected technologies that allow us to control everything from heating and cooling to lighting and security from practically anywhere. A new generation of sensors being developed by engineering researchers at Case Western Reserve could be the next step in smart buildings. By using what these scientists are calling the Internet of Ears, this suite of sensors would read not only the vibrations, sounds and even the specific gait, or other movements associated with people and animals in a building, but also any subtle changes in the existing ambient electrical field. While still perhaps a decade or so away, the home of the future could be a building that adjusts to your activity with only a few small, hidden sensors in the walls and floor and without the need for invasive cameras.

Learn more at engineering.case.edu/news/internet-of-ears.

Computer science student's savvy with Amazon Alexa gets the company's attention.



First-year Case Western Reserve computer science student Austin Wilson was only 16 years old when his ability to use Alexa to move a K'nex-constructed car won him second place in Hackster's Internet of Voice Challenge and cemented his interest in Amazon's voice service.

Since then, he's honed his skills on more complex projects, collecting more prizes along the way and attracting the attention of publications like *PC Magazine, International Business Times UK* and *Popular Mechanics*. Amazon itself has taken notice of Wilson's work—the company named him an Alexa Champion, a title bestowed on a select group of individuals who have been most engaged with the voice service. He was even highlighted in Amazon's Alexa Pioneers series.

Learn more about Wilson and how he's impressed Amazon at engineering.case.edu/news/Wilson.



Case Western Reserve's Sears think[box] collaborates with a local veterinarian to create 3-D models to plan the treatment for a puppy with a badly broken leg. Watch Bento get back on his paws: **engineering.case.edu/Bento**.



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