





## DATA-BASED DIAGNOSES

Researchers create deep-learning networks to improve detection of breast cancer, Alzheimer's disease.

Anant Madabhushi, the F. Alex Nason Professor II in the Department of Biomedical Engineering and the director of the Center for Computational Imaging and Personalized Diagnostics, has developed machine-learning programs to improve diagnoses of breast cancer and Alzheimer's disease.

In a study published in *Scientific Reports*, Madabhushi demonstrated how the computer-based program he developed with his team outperformed traditional methods for diagnosing Alzheimer's. He has also developed a program that was 100-percent accurate in determining whether invasive forms of breast cancer were present in whole biopsy slides.

Learn more at [engineering.case.edu/data-based-diagnoses](http://engineering.case.edu/data-based-diagnoses).

## WALKING THE WALK

Research team receives NSF funding for neuroprosthetic walking system.

An interdisciplinary team of engineering researchers has received a \$1-million National Science Foundation grant to develop control algorithms for a hybrid neuroprosthetic walking system that uses the wearer's own electrically stimulated muscles and small assistive motors at the joints to help patients with spinal cord injuries maintain balance while walking and standing, without conscious effort from the patient.

The team includes Roger Quinn, the Arthur P. Armington Professor of Engineering in the Department of Mechanical and Aerospace Engineering, Ronald Triolo, professor of biomedical engineering and executive director of the Advanced Platform Technology Center, and Musa Audu, research associate professor of biomedical engineering.

*Nature* named Case Western Reserve among the top 20 institutions for innovation impact, and the Brookings Institution ranked the university 13th in the country for commercialization.

## FIRE FOCUS

Case Western Reserve hosted a Symposium on Advanced Fire Science and Technology on campus in June, attracting nationally recognized speakers from the FAA, NASA, NIST, the U.S. Air Force, UL, American University, North Carolina State University, the University of Dayton and more, who addressed topics such as the future of flame retardancy, the evolution of safety standards and building design requirements, and spacecraft fire safety.

## EXPLORING 2-D OXIDES <<<<<<

Researchers receive \$1.2M to study 2-D oxides for next generation materials.

Alp Sehirlioglu, the Warren E. Rupp Assistant Professor in the Department of Materials Science and Engineering at Case Western Reserve, is leading a team that received a \$1.2-million grant from the Air Force Office of Scientific Research to explore the nanostructures of atomically thin 2-D oxides.

Oxide nanosheets provide rich and varied electronic, structural and physical properties, making them valuable tools to enable breakthroughs in electronics, spintronics, energy conversion and storage, gas and biological sensors, and more.

The project aims to clarify and establish processing requirements for 2-D metal oxides to access these materials down to the smallest level—mono- and nano-layers—and control their lateral size, crystallographic structure and electrical properties.

Collaborators include Case Western Reserve faculty members Emily Pentzer, assistant professor of chemistry; Walter Lambrecht and Xuan Gao, professor and associate professor of physics; as well as Marie-Helen Berger, a professor at the Ecole de Mines in Paris.



## A HELPING HAND

# Biomedical engineering student uses Sears think[box] to build assistive device to help his mother with physical therapy.

Case Western Reserve University senior Turner Montgomery chose to major in biomedical engineering to help people—and he’s starting close to home.

Shortly after Montgomery was born, his mother was diagnosed with a rare autoimmune disease. She struggled with the condition for decades, and when Montgomery launched a deeper search into her medical records with the help of physicians at Case Western Reserve, Johns Hopkins University and the University of Kentucky Medical Center, he made a startling discovery: his mother had been misdiagnosed.

Armed with this knowledge and a new diagnosis of muscular dystrophy, Montgomery used Sears think[box] at Case Western Reserve to build an assistive device called an EMG machine to help his mother with the physical therapy she’s using to treat her condition.

Learn more and watch a video at [engineering.case.edu/Turner-Montgomery-project](http://engineering.case.edu/Turner-Montgomery-project).

## MAKER MINDS MEET UP



Photos by Hilary Bovay

Case Western Reserve University welcomed 350 attendees from around the world as the host of the 2017 International Symposium on Academic Makerspaces last fall. The five-day event included sessions on funding and sustaining a makerspace, design and workflow, management and staffing, and more. Attendees also got the chance to see high-tech prototyping and fabrication equipment in action and attend a special workshop on 10x thinking.

Learn more at [engineering.case.edu/ISAM-2017](http://engineering.case.edu/ISAM-2017).

# next

## INSIDE THIS ISSUE

- Leading the IoT revolution
- First steps toward flying cars
- School leadership updates
- Disease-diagnosing computers
- Preventing oil spills

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