Researchers develop smart sensors to prevent power outages

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The new sensors will collect and transmit data to pinpoint potential problems. Credit: University of Akron

Who turned out the lights?

Since the natural breakdown of overhead power lines and underground cables is frequently discovered only after power has been lost, University of Akron researchers are taking a field-proven detection technology from Exacter, Inc. that can reliably predict, detect and prevent problems with electrical equipment and miniaturizing it for applications on electrical distribution and transmission lines.

Dr. Jose Alexis De Abreu-Garcia and Dr. Yilmaz Sozer, professors of electrical engineering, are working with Exacter, a Columbus-based technology provider to the utilities industry, to create cell phone-sized "smart sensors" that can detect and measure radio frequency signals emitted from faulty components.

Currently, electrical equipment must be inspected on-site by powerline technicians. But the new sensors collect and transmit data that allow electric utilities to continuously monitor the health of the grid and pinpoint the problematic locations that could result in power failures – including fires and explosions.

New level of protection

"The sensors being developed by our team will be measuring various factors that can adversely impact electrical transmission and cause power outages," De Abreu-Garcia says. "Many of these measurements are not being monitored or collected today."

The project has received more than $3 million in funding from the Ohio Development Service Agency's Innovation Platform Program. It also has benefitted from the input of more than 25 major electrical utilities

leaders from around the country, De Abreu-Garcia adds.

The sensors are among the latest contributions to the Industrial Internet of Things (IIoT), a network of industrial structures equipped with electronic devices to facilitate communication and data exchange.

"Creating these never-before developed IIoT sensors was an ambitious undertaking, but our team of researchers has been up to the task," says Sozer. "It has been a very good experience having our students go into the field and collaborate with the utilities on the testing and validation of these unique sensors and technology."

View from industry

"It's been a very fruitful collaboration," says John Lauletta, CEO and chief technical officer of Exacter. "We're producing new, state-of-the-art technologies, and we're applying those technologies to the electric grid and getting results already. Some of the country's largest utilities are testing products from The University of Akron."

The professors are working with Exacter to have a fully commercialized product by year's end, with Exacter releasing it to the utility industry in the first quarter of 2019.

Provided by University of Akron