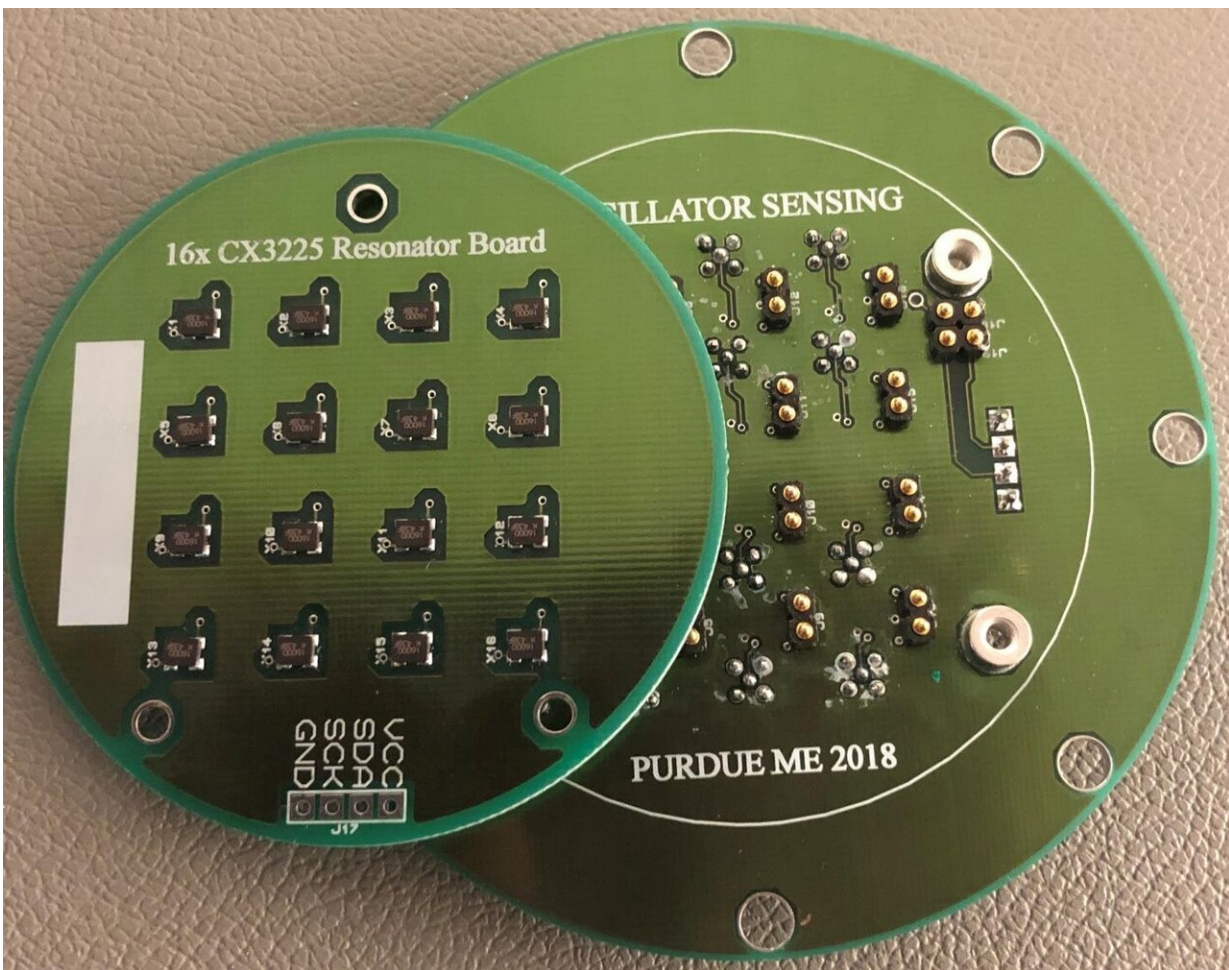


# Carbon dioxide sensor can lower energy use, reduce utility costs

April 21 2020, by Chris Adam



Purdue University researchers developed a sensor to help control and cut down on energy consumption through heating and ventilation systems, particularly those used in large office and hospitality industry buildings. Credit: Purdue University/Jeff Rhoads

Walk in a room, the light goes on. Most people are familiar with the motion sensors that detect activity and then turn on the lights.

Purdue University researchers are turning to similar technologies to help manage [climate control](#) and indoor air quality. They have developed a sensor to help control and cut down on [energy consumption](#) through heating and [ventilation systems](#), particularly those used in large office and hospitality industry buildings.

"Climate control and proper ventilation are especially important because most people spend considerably more time indoors than outside," said Jeff Rhoads, a professor of mechanical engineering in Purdue's College of Engineering. "Climate control and ventilation are also huge sources of energy consumption in the United States and around the world."

Rhoads and his team have developed a lower-cost, lower-energy carbon dioxide sensor that could change the way energy is used to heat, cool and ventilate large buildings and eventually homes.

The Purdue project is supported by ARPA-E, the Advanced Research Projects Agency—Energy, a government agency tasked with promoting and funding research and development of advanced energy technologies.

The technology identifies when carbon dioxide is released into the air by a person, or people entering and breathing inside that space.

The Purdue sensor detects the carbon dioxide so that heating and ventilation systems can control the climate and air turnover in spaces that are occupied, instead of using energy to control rooms that are empty.

"We leverage two technologies with our innovative device: resonant sensing and resistive sensing," said Rhoads, a leading sensor researcher who serves as the director of Purdue's Ray W. Herrick Labs. "We use

them in combination to detect carbon dioxide. This is a great alternative to available technologies that may not reliably measure carbon dioxide while remaining competitive in cost and power consumption."

Rhoads said the Purdue sensor also helps address privacy concerns about using camera technology for detecting when someone enters and leaves a room.

The team, which includes professors Bryan Boudouris from Purdue's School of Chemical Engineering, and Jim Braun and George Chiu from Purdue's School of Mechanical Engineering, is working to integrate the sensor with other Internet of Things building technology.

Provided by Purdue University

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