

# Carnegie Mellon University's Speck device monitors indoor pollution



*Guy Wathen | Trib Total Media*

This personal air quality monitor, known as Speck, was developed in Carnegie Mellon University's Community Robotics Education and Technology Empowerment (CREATE) Lab.



By [Aaron Aupperlee](#)

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The pollution from your living room couch can be as harmful as pollution from coke ovens on Neville Island and in Clairton, experts say.

And while the Allegheny County Health Department spends tens of thousands of dollars on monitors to study particles spewed into the air by dirty industries, Carnegie Mellon University has developed a \$200 model to study the air in your home.

"We spend a lot of time indoors," said Bea Dias, community outreach coordinator for CMU's Community Robotics, Education and Technology Empowerment Lab.

"Understanding what you're breathing is critical. Once you know, you can take action inside your home."

The lab developed Speck, a tabletop, indoor air quality monitor that debuted this month at the South by Southwest

## How to get Speck

The first orders of Speck units should ship by the end of April.

- Buy online for \$200 at [specksensor.com](http://specksensor.com).
- The Squirrel Hill branch of the Carnegie Public Library has 10 to loan.
- The Pittsburgh Foundation has ordered 1,000 Specks and plans to provide them to low-income families in areas with poor air quality.



festival in Austin after four years of research, development, testing and prototypes.

The Speck, no larger than a coffee cup, monitors particulate matter, or PM, as small as PM 2.5 — about  $\frac{1}{30}$ th of the width of a human hair. The Environmental Protection Agency sets limits on the number of particles that size allowed in the air.

When inhaled, the tiny particles can travel deep into a person's lungs, carrying with them toxic chemicals and carcinogens, said Jim Thompson, deputy director for environmental quality at the health department. They cause coughing, wheezing, shortness of breath and lung damage, he said, and can aggravate asthma and heart diseases.

Thompson said it is tough to know whether particles from a factory are worse than those from someone's couch. Dust mites are the leading trigger of asthma attacks, he said.

“Certainly, the Shenango Coke Works is emitting more than what's coming from your couch, but on the other hand, you're in much closer proximity to your couch. You're right there breathing all those emissions.”

The health department is testing an early version of Speck against its outdoor air monitors, which can cost more than \$30,000. Readings from Speck don't match those from the monitors.

But Dias said Speck can provide people with important data about their air.

Dias noticed spikes in the number of particles when she cooked, especially while frying onions. She stopped frying onions and stopped using the fan above her stove, which pushed the poor air into her child's room.

A biology teacher at Sto-Rox High School used Speck to show that spikes in particles in his classroom correlated with a diesel generator powering a cellphone tower on the school's roof, Dias said. The data persuaded the district to move the generator away from a vent.

Mickey Gniadek, 64, of Finleyville started monitoring his indoor air quality with Speck about a year ago through a program with the Southwest Pennsylvania Environmental Health Project, which has about 100 early models to lend to people living near Marcellus shale natural gas wells.

Gniadek and his neighbors sued gas companies operating near their homes, claiming the well pad ruined their quality of life. He said his Speck monitor would flash red while crews worked at the pad about 550 feet from his house.

“Whenever they got really crazy over there, we got some interesting readings,” Gniadek said. “If it gets bad enough, we get in our car and leave.”

Dias said Speck data is not meant to scare people from their homes. Instead, she hoped they would take control of the air they breathe.

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