CMU Tech Company Aims to Empower Pittsburgh with Cleaner Air

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A Speck unit sits on a table monitoring the air quality in a living room.

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Beatrice Dias has asthma, and her three-year-old has had his own respiratory issues, so she installed a personal air monitoring device known as a Speck to see if the air in her home was contributing to their health problems.

"It was as simple as turning on the hood vent above the stove and realizing, 'wait, the air quality is getting worse, what am I doing wrong? This was supposed to be good for it,'" she said. "But then I followed the trajectory of the air and realized the hood vent was just venting the air up as opposed out of the house."

Revelations like this is why the Community Robotics Education and Technology Empowerment (CREATE) Lab began selling Speck Monday. The air quality monitor detects fine particulates in a room by using a fan to create a vacuum that sucks the matter into the sensor.

The Carnegie Mellon University spinoff company is specifically measuring the PM2.5 in the air.

"What PM2.5 actually is can vary widely," Michael Taylor, a PhD student at the CREATE Lab, said. "It can be things like black carbon or other kinds of smoke, it can be oil droplets if you're cooking, it can be a lot of different things."

Taylor described PM2.5 as basically any particulate matter suspended in the air that is smaller than 2.5 microns – or one thirtieth the size of a human hair.

"However, they can lodge deep in your lungs, and cause significantly bad health effects," Dias, CREATE Lab's Community Outreach Coordinator, said. "Particularly if you have asthma or some respiratory issues or cardiovascular issues, they could be bad if you're inhaling them over a long period of time or in large concentrations in a short period of time."

She said Speck provides a number and a color scale detecting if the air quality is "good," "moderate," "elevated" or "high." Because the monitor is Wi-Fi-connected, the information uploads into a database.

"So you can use that information to see patterns, detect, you know, does something happen every afternoon at 1 o'clock or what is it, how can I figure that out? And become investigative and learn about your home," Dias said.

The data can be kept private or made public.

Dias said they hope Speck helps empower the community, which is also the mission of their lab.

"We are engaging with schools to create curriculum and lesson plans around Speck to encourage students to learn about air quality and do experiments with it," Dias said. "And at the same time, we have this commercial product that people can purchase and really learn more about the air quality."

The Heinz Endowments and Pittsburgh Foundation recently bought 1,000 devices that will be given to libraries to be checked out by card holders and organizations. They are already available at the Squirrel Hill Library.

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