AirSense: new technology by ECE research team monitors indoor air quality

Air in the home can be heavily polluted just by daily household activities. Unfortunately, since many indoor air pollutants are colorless and odorless, people often fail to detect them.

A team of engineers at Michigan State University is perfecting new technology that not only warns of a problem with indoor air, but also identifies the source of the pollution and offers suggestions on how to remedy the situation.

Mi Zhang, an assistant professor of electrical and computer engineering, is heading up the team that developed the new technology known as AirSense.

AirSense is an intelligent, home-based indoor air quality, or IAQ, monitoring and analytics system designed to increase people’s awareness of their IAQ and help manage it in their homes.

“Different pollution sources generate different types of pollutants in different ways,” Zhang said. “For example, oil-
based cooking could generate remarkable amounts of harmful airborne particulate matter in a very short period of time that stay in the air for a long time. Household products such as disinfectants and pesticides contain and release numerous volatile organic compounds.

“Our technology leverages these differences to identify the source and forecast pollution levels to estimate the seriousness of the problem,” he said.

The technology also will provide a detailed weekly IAQ profiling report that helps people better understand how their household activities impact air quality.

Poor air quality could pose significant risks to people’s health and is the leading cause of respiratory infections, chronic lung diseases and cancers.

“Our technology would be very helpful for people who are vulnerable to poor air quality, such as the elderly and children with asthma,” Zhang said.

Although currently designed for home use, AirSense could eventually be applied in public spaces such as office buildings, shopping malls and subway stations.

Zhang said they hope the technology will be available for public use soon.

The work is published in the proceedings of the 2016 ACM International Joint Conference on Pervasive and Ubiquitous Computing in Germany.

Other members of Zhang’s team include Biyi Fang and Taiwoo Park from Michigan State University and Qiumin Xu.
from University of Southern California.

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