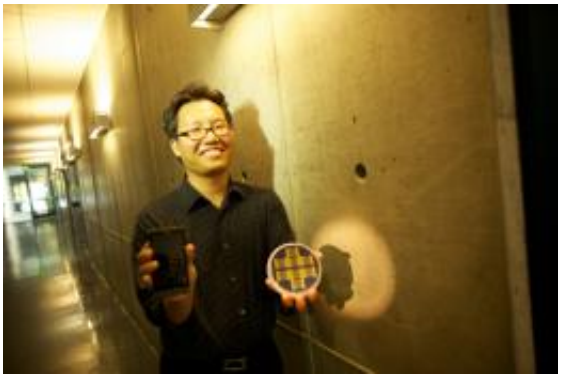
Engineers develop 'electronic nose' prototype

August 21 2012



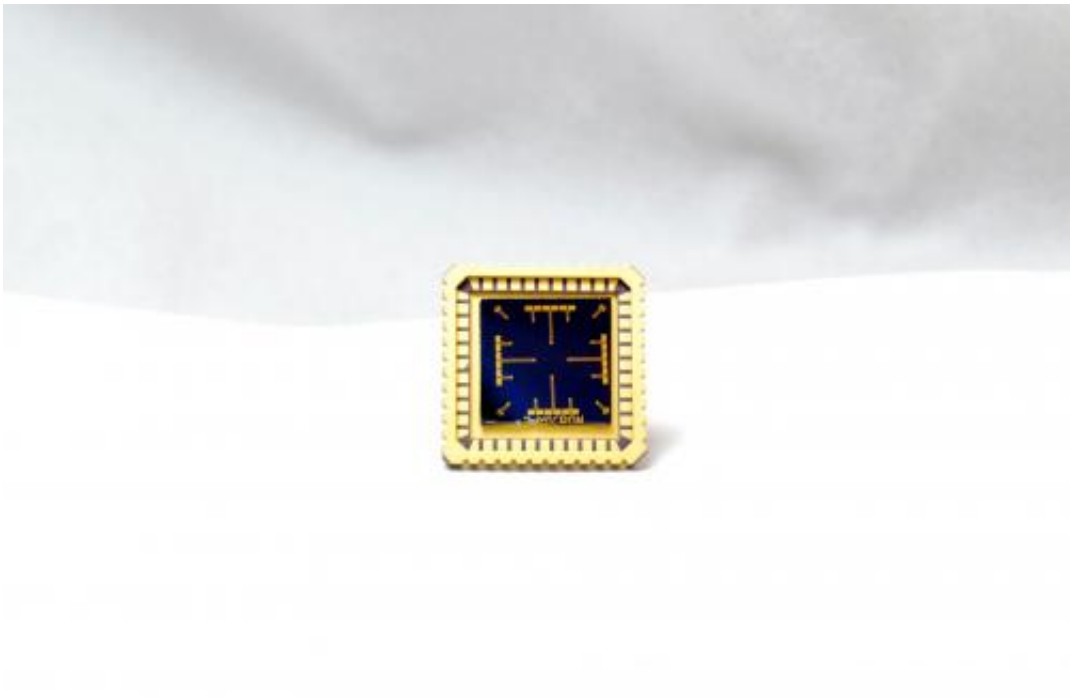
Nosang Myung holds the sensor that allows for the detection of harmful airborne substances. Credit: UC Riverside

(Phys.org) -- Research by Nosang Myung, a professor at the University of California, Riverside, Bourns College of Engineering, has enabled a Riverside company to develop an "electronic nose" prototype that can detect small quantities of harmful airborne substances.

Nano Engineered Applications, Inc., an Innovation Economy Corporation company, has completed the prototype which is based on intellectual property exclusively licensed from the University of California. The device has potential applications in agriculture (detecting pesticide levels), industrial sites (detecting gas leaks, combustion emissions), homeland security (warning systems for bio-terrorism) and the military (detecting chemical warfare agents).

"This is a really important step," Myung said. "The prototype clearly shows that our research at the university has applications in industry."

Steve Abbott, president of Nano Engineered Applications, Inc., which is designing the product and expects to begin selling it within a year, said the company is now focused on writing software related to the device and working to make it smaller.



Sensor developed by Nosang Myung that can detect airborne toxins

At present, it's about four inches by seven inches. The goal is to make it the size of a credit card. At that size, a multi-channel sensor would be able to detect up to eight toxins. A single-channel sensor device could be the size of a fingernail.

Nano Engineered Applications is now looking to collaborate with

companies that could bring the production version to market, Abbott said. He believes the product will initially be commercialized on the industrial side for monitoring such things as gas and toxin leaks, and emissions.

The key to the prototype is the nanosensor array that Myung started developing eight years ago. It uses functionalized carbon nanotubes, which are 100,000 times finer than human hair, to detect airborne toxins down to the parts per billion level.

The prototype also includes a computer chip, USB ports, and temperature and humidity sensors. Version 2 of the prototype, due out in 30 days, will integrate a GPS device and a Bluetooth unit to sync it with a smart phone. The development team is evaluating if adding Wi-Fi capabilities will add value.

The unit is designed to be incorporated in three basic platforms: a handheld device, a wearable device and in a smart phone. Different platforms will be used depending on the application.

For example, a handheld unit could be used for environmental monitoring, such as a gas spill. A wearable unit could be used for a children's asthma study in which the researcher wants to monitor air quality. A smart phone unit could be used by public safety officials to detect a potentially harmful airborne agent.

In the past year, Nano Engineered Applications, Inc. has provided financial support to Myung's research. Of that, a portion went toward naming Myung's lab the Innovation Economy Corporation Laboratory.

Provided by University of California - Riverside