

Students create portable device to detect suicide bombers (w/ Video)

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(PhysOrg.com) -- Improvised explosive devices (IEDs), the weapons of suicide bombers, are a major cause of soldier casualties in Iraq and Afghanistan. A group of University of Michigan engineering undergraduate students have developed a new way to detect them.

The students invented portable, palm-sized metal detectors that could be hidden in trash cans, under tables or in flower pots, for example. The detectors are designed to be part of a wireless sensor network that conveys to a base station where suspicious objects are located and who might be carrying them. Compared with existing technology, the sensors are cheaper, lower-power and longer-range. Each of the sensors weighs about 2 pounds.

"Their invention outperforms everything that exists in the market today," said Nilton Renno, a professor in the U-M Department of Atmospheric, Oceanic and Space Sciences. The students undertook this project in Renno's Engineering 450 senior level design class.

"They clearly have an excellent understanding of the problem. They also thought strategically and designed and optimized their solution. The combination of a movable command center with a [wireless sensor network](#) can be easily deployed in the field and adapted to different situations."

The core technology is based on a magnetometer, or metal detector, explained Ashwin Lalendran, an engineering student who worked on the

project and graduated in May.

"We built it entirely in-house—the hardware and the software," Lalendran said. "Our sensors are small, flexible to deploy, inexpensive and scalable. It's extremely novel technology."

The U-M students recently won an Air Force-sponsored competition with Ohio State University. The U.S. Air Force Research Laboratory at Wright Patterson Air Force Base sponsored the project as well as the contest. Air Force research labs across the country sponsor similar contests on a regular basis to provide rapid reaction and innovative solutions to the Department of Defense's urgent needs, says Capt. Nate Terning, AFRL rapid reaction projects director.

The teams from U-M and Ohio State demonstrated their inventions June 2-3 in Dayton, Ohio at a mock large tailgate event where simulated IEDs and the students' technologies were hidden among the crowd. The students' technology was tasked with finding IEDs in the purses, backpacks or other packages of the tailgaters, without the tailgaters' knowledge. Michigan's invention found more IEDs than Ohio State's.

"We had an excellent turnout in technology," Tenning said. "Regardless of the competition results, often successful ideas from each student team can be combined into a product which is then realized for DoD use in the future."

The students will continue to work on this project through the summer. Other students involved are: Steve Boland, a senior atmospheric, oceanic and space sciences major; Andry Supian a mechanical engineering major who graduated in April; Brian Hale, a senior aerospace engineering major; Kevin Huang, a junior computer science major; Michael Shin, a junior computer engineering major; and Vitaly Shatkovsky, a mechanical engineering major who graduated in April.

"I am very proud of the team for applying a sound engineering approach and a lot of imagination to the solution of an extremely difficult real-world problem. They worked well together and never gave up when the going got rough," said Bruce Block, an engineer in the Space Physics Research Laboratory who worked with the students.

Provided by University of Michigan ([news](#) : [web](#))

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