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2010-01-27: Q&A: Leading an in-depth effort to prevent terrorism

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Q&A: Leading an in-depth effort to prevent terrorism



Professor Silevitch focuses on finding what's "below the surface." Photo by Craig Bailey.

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Researchers at Northeastern are investigating ways to make our nation safer from terrorist threats through the development of cutting-edge imaging technologies. The work is focused within the Bernard M. Gordon Center for Subsurface Sensing and Imaging Systems ([Gordon-CenSSIS](#)) and the Awareness and Localization of Explosives-related Threats center ([ALERT](#)), funded by the National Science Foundation and the Department of Homeland Security, respectively. Professor of Electrical and Computer Engineering Michael Silevitch, who leads Gordon-CenSSIS and co-directs ALERT, talks about "below-the-surface" imaging

techniques and his work with the Department of Homeland Security.

Given the events of the past month, it is understandable that airline passengers might feel wary about flying. Are our airports and airlines any less safe than they were a year ago? Five years ago?

No, in fact, I believe that the airports are in general safer today compared to five years ago. That being said, there are existing technologies that can be more widely deployed to make airport screening even more reliable. Examples include dual energy X-ray screening for baggage and whole-body imaging scanners.

Where do you see imaging techniques moving in the near future? Will metal detectors become a thing of the past?

Multi-mode detectors (the use of two different and complementary screening techniques) are being examined for reliability. For example, X-ray technology can scan the contents inside of a bag and infrared chemical detectors can detect traces of chemicals.

I think that current technologies, like metal detectors, will always have a role in screening because they are easy to deploy and interpret. Moreover, their signals can be used to indicate the need for more in-depth secondary screening.

What do you consider the most important part of ramping up our homeland security efforts to keep the nation safe?

One important area would be to create seamless ways for various sectors and organizations to work together more effectively. There would be tremendous value in creating collaborations between the academic community and our U.S. national laboratories.

The Department of Homeland Security's (DHS) Office of Science and Technology has begun working towards this by establishing academic Centers of Excellence, including ALERT. It is these nontraditional partnerships that will bear important fruit in terms of new approaches on how to make our nation more secure.

How are you working to deter the acts of potential suicide bombers before they strike?

The ALERT center has several ongoing projects to deal with suicide bombers. One involves the use of radar technology to detect signatures of hidden metallic objects under clothing. Another involves using video techniques to look at the motion of people in a crowd and discern abnormal behavior. These two complementary technologies could help detect potential suicide bomber threats.

What steps are you taking at ALERT that will help thwart future terrorist attacks in the United States?

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ALERT has hosted a number of counter-IED (improvised explosive device) and imaging workshops to identify the gaps in our current knowledge and technology base. Based on these workshops, we can provide more strategic guidance to the DHS and advise them where to focus future efforts to ensure progress in combating these significant threats.

What is the most intriguing part of your research?

The theme of my research is "finding hidden things," whether they are hidden underground, inside the human body, such as a tumor, under the water or within a biological organism. It was a natural extension to look for hidden things that were related to explosive threats.

The intriguing part is that we hope to extend the use of these analytical tools to address the detection of hidden objects in other places. Showing the generality of our approach will lead to the creation of a new field of engineering study to deal with difficult detection problems. This is my ultimate goal.

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