Colleges leap into new field: Homeland security

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By Vinessa Erminio/The Star-Ledger

Hundreds of schools using grants to concoct better ways to foil terrorists


Zhiguo Li demonstrates face-tracking software that he, Atul Kanaujia, left, and other Rutgers graduate students are working on to help interrogators determine when someone is lying.

BY ANA M. ALAYA
STAR-LEDGER STAFF

Christina Schroepfer dreams of becoming a professor but never thought that, along the way, she'd find herself in the trenches of the war on terror.
As part of a research project, the Rutgers University graduate student from Piscataway toured the Port of Philadelphia with the Coast Guard and scrutinized the inspection of ship containers at Port Elizabeth with U.S. Customs agents.

"Port security is a hot topic right now," said Schroepfer, a 25-year-old industrial engineering student, who worked on a math model to help container inspectors search for everything from dirty bombs to drugs more efficiently.

"There's lots of interest in this and lots of money for research," she added. "And I feel like I'm supporting people who have an important job to do."

Homeland security has become big business in the aftermath of 9/11, and colleges across the country are cashing in, using federal research dollars to study a range of related needs, from catching cyber-spies to detecting infectious diseases.

Some 350 universities and colleges across the country are involved in research or are offering courses or degrees in some aspect of homeland security, according to the National Academic Consortium for Homeland Security. "There's a huge amount of interest, though there is little consensus on what homeland security really includes, because it is still evolving," said Todd Stewart, director of the consortium. "It's all over the map, but that's not necessarily a bad thing."

Rutgers, the New Jersey Institute of Technology and the University of Medicine and Dentistry of New Jersey, as well as some private schools including Stevens Institute of Technology and Seton Hall, are involved in dozens of homeland security research projects.

Meanwhile, Richard Stockton State College, Montclair State and Kean University are among the schools offering new courses or programs dealing with homeland security.

Fred Roberts, head of Rutgers' Center for Discrete Mathematics and Theoretical Computer Science, is overseeing a new $3 million grant from the Department of Homeland Security to study ways to monitor news stories, blogs and other sources for signs of potential terrorist activity.

"We will be looking at getting an early warning that someone is planning a terrorist attack or someone is going to dump some anthrax on us," Roberts said.

Like many homeland security projects, the one headed by Roberts stresses collaboration. It involves researchers from AT&T Laboratories, Lucent Technologies Bell Labs, Princeton University, other state institutes and three universities across the country.

Rutgers also is developing degree and certificate programs to train students in the new technology, Roberts said.

"Our feeling is we're in this for the long haul," Roberts said. "Whether it's protection against terror attacks or natural disasters, training the work force for the future is a major initiative."

THE TELLTALE SHRUG

Students say they love being on the cutting edge of a new field.

"It's great to do research that can be used to help society, especially if it can be used to detect terrorists," said Zhiguo Li, 29, of Beijing, a Rutgers graduate student involved in a $3.5 million project to help interrogators determine when someone is lying.

Zhiguo and other researchers are collaborating with psychologists to study how subtle body movements -- the raising of an eyebrow, a shoulder shrug -- could signal deception. The computer technology could help immigration officers as they screen people at high-security locations.
Dimitris Metaxas, a computer science professor and director of the university's Center for Computational Biomedicine Imaging and Modeling, said the research brings together scientists from many disciplines -- biology, medicine, computers and linguistics. He said the technology also has potential for industry and criminal justice.

Matt Clark, director of the DHS' university programs division, which is spending $50 million on science and technology research this year, said higher education plays a critical role in national defense.

"They are the leading thinkers, and universities can be incredibly cost-effective in term of their physical and intellectual capabilities," he said.

It's difficult to estimate the total amount of homeland security research funding for higher education, because so many departments, including the National Science Foundation and the Department of Defense, dole out grants, said Amy Scott of the Association of American Universities. But the DHS university programs budget, which the department considers seed money, is projected to decrease by $10 million next year.

"A lot of the universities also put their own institutional funds into this research," Scott said. "They are successful in what they're doing but they need to be financially supported."

**SCIENCE FACT**

Stevens Institute of Technology gets a large portion of its homeland security funding from the Department of Defense. Researchers at the Hoboken college are studying underwater sensors that can detect chemical spills, and technology to decipher secret codes and images sent among terrorists over the Internet.

With a focus on trying to predict and prevent terror attacks, Helena Wisniewski, Stevens' vice president for research and enterprise development, said researchers have developed a "predator vision" infrared surveillance camera that can capture quality images at great distances through fog, smog and snow.

Another "next-generation camera" under development is designed to detect chemical particles in the air -- perhaps allowing authorities to sniff out suicide bombers before they strike.

The new technology can sound like science fiction, but the government is already using some of it, officials at several colleges said.

"We have been focusing on working with government and industry and providing them tools they can use," Wisniewski said. "It's not just research reports."

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