# Ways to fight terrorism (4-6)

## 4. Sharpening X-ray vision

Finding concealed weapons or spying on hostage takers through the walls of buildings are just some of the advantages of improved processing technology for X-rays and radar images. Raghuveer Rao, an electrical engineering professor at the Rochester Institute of Technology, has come up with the way to more easily discern the edges of shapes by using wavelength analysis, a mathematical function that parses data into different frequency components. “Objects that you couldn’t detect previously now stand out “, says Rao, who believes the technology has broad applications when detection is necessary. The wavelet image enhancement technology allows improved detection of easily concealed objects such as the box cutters that were used to hijack the airplanes in the terrorist attacks of September 11. The technology is undergoing laboratory demonstrations and could be commercially available within the next two years.

## 5. Double-checking in

Metal detectors at airports provided only limited airport security prior to September 11; no more than 5 percent of all checked baggage was typically screened for explosives. That’s going to change now due to the terrorist attacks, and the Federal Aviation Authority is re-examining techniques to quickly scan more than one billion pieces of luggage checked each year. Since 1988, William Mayo, a professor of ceramic and materials engineering at Rutgers University, has been developing a machine using X-ray diffraction that examines the unique atomic structure of each article in a suitcase. Bombs, like other objects, contain a unique molecular fingerprint, and Mayo’s machine can be up-dated to recognize new explosives as they are developed. Now, the FAA has asked Mayo to build new version for testing that can scan a cargo-hold of luggage in less than an hour. Mayo hopes that new generation of the 5-foot tall machines will be ready in next year.

## 6. Going postal

When the prospect of anthrax-laces letters scaring many postal and office workers, Juyang Weng believes that robots ought to open the mail. The Michigan State University associate computer science and engineering professor is developing a variety of smart robots that will have the ability to learn on their own. The key element is attaching the robot’s brain to a body with humanlike appendages, such as arms that can manipulate objects. The anthropomorphic creation, code named “Dave” can then learn from its own actions. Weng expects to have a prototype ready in several months.