Shoe scanner set to make travel safer

October 20 2008

(PhysOrg.com) -- An engineer at the University of Manchester has developed a prototype scanner that could be used to detect explosives and weapons hidden in the shoes of travellers.

The SecuriScan system, which is the brainchild of Professor Wuqiang Yang from the School of Electrical and Electronic Engineering, can detect and pinpoint suspicious objects instantly.

The technology could mean travellers of the future will not need to waste time taking off their shoes – and the long queues seen at airports today could disappear.

Instead, security staff may be able to spot people with concealed items in their shoes as they walk through passport control or through traditional security checks. Passengers would not necessarily even be aware their feet were being monitored.

After the research was featured in The Observer newspaper and on ITV Granada Reports, the scanner has now triggered considerable interest among airport security chiefs in both the US and the UK.

The current prototype system uses electric and magnetic sensing to form a colourful computer image of a person's shoes. The shapes of both metallic and ceramic knives are clearly visible when inserted into shoes in lab conditions.

Prof Yang said: "The major difference between SecuriScan and existing

security scanning methods is that this patented technology does not use any radiation source, such as x-ray, which causes safety concerns and is expensive both to purchase and maintain, and microwave, which uses the same technology as used in microwave ovens and again causes safety concerns.

“At present, what we have is basically a laboratory toy. What we need to do now is develop a more advanced and realistic prototype and for this we need the co-operation of industry and the relevant authorities.”

Prof Yang says that once the system has been fully developed, it would cost only a few thousand pounds and could be installed under carpets, tiles or flooring in airports

He says it is also capable of learning the characteristics of new threat substances and non-metallic weapons. In this way, the system would not rely so heavily on a human spotting as threat, as the technology would alert staff when it spotted something suspicious.

Prof Yang, who is based in the Sensing, Imaging and Signal Processing Group, is now working on hand-held versions of the detector that could be used to screen abandoned luggage or to scan envelopes and parcels delivered to companies.

He is also looking at whether the underlying technology – known as electrical capacitance tomography – could be used in the detection of plastic land mines.

Provided by University of Manchester