

# Platform safety on the radar for researchers

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Systems used to detect aircraft and ships could soon be fitted in train stations to quickly identify objects – or even people – that have fallen on the tracks, preventing serious accidents and reducing delays that are frequently caused by these mishaps.

Used in conjunction with CCTV, which can often blur or become obstructed, a [radar](#) device could quickly identify luggage items that regularly fall off station platforms and in the event of a person falling on the tracks, feedback to a system that stops oncoming trains and cuts the high voltage of the lines.

The detection system, demonstrated today, 6 January, in IOP Publishing's journal *Measurement Science and Technology*, sends ultra wideband radio waves towards objects and then records them as they bounce back, revealing the intricate characteristics of the object in question.

"The aim of the system is to identify any objects or persons that may have fallen onto the tracks. In a large, capital city underground, this can happen two to three times a week and lead to significantly long service interruptions.

"With the possibility of trains, passengers and even poor lighting, in some instances, obscuring the view of CCTV cameras, radar techniques could certainly be effective in these scenarios," said lead author Ali Mroué.

The researchers, from IFSTTAR and IEMN, in the framework of the Université Lille Nord de France, used an Automatic Target Recognition (ATR) procedure whereby the characteristics of an object are defined and then trimmed down so only the most important ones are stored. The characteristics are then compared to those of other objects on a database, with the overall classification depending on the degree of similarity.

Using a computer model, the researchers initially tested out a number of objects, ranging from suitcases to glass bottles, and several models of the human body: an adult, a teenager and a child. In the simulations, the radar was able to successfully discriminate between the different objects, confirming its applicability.

Real-life experiments were then performed in a small, echo-free chamber, using a three metre long waveguide – a solid beam-like structure that guides the radio waves in a certain direction; in this case, towards the [object](#) you are measuring.

In these experiments, three humans were used – two men and one woman – along with two luggage bags made of different materials. The system successfully differentiated between the luggage bags and the humans, meaning a potential system could highlight the urgency of a response.

"We hope these devices will be used in the near future since they are very complementary to existing video systems and have a similar final cost. The complementary use of video and radar systems could lead to low levels of false detection, which is mandatory for this application, and maximise the chance of survival for passengers who have fallen on the line," continued Mroué.

**More information:** "Automatic radar target recognition of objects on railway tracks" (2012 *Meas. Sci. Technol.* 23 025401)  
[iopscience.iop.org/0957-0233/23/2/025001](http://iopscience.iop.org/0957-0233/23/2/025001)

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