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Hand-held device detects impaired drivers

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A hand-held device designed to identify drivers impaired by drugs, alcohol or excessive tiredness, is being evaluated by the British police.

The device is intended to deliver a quick yes or no verdict on whether a person is in a fit state to drive and works by assessing the driver's behaviour, rather than testing for particular substances. It is the first of its kind to be tested by police anywhere in the world.

The "impairment detector" is still in the early stages of development, but the Police Scientific Development Branch (PSDB) in St Albans, Hertfordshire, is studying results from a prototype to decide whether to take the project further. If it gets the go-ahead, at least two years of testing will be needed before the detector is ready for the streets.

"Early results are very promising," says Julia Boyle of the University of Surrey in Guildford, UK, who is leading the research on behalf of the PSDB and who revealed the results last week at a conference at Cranfield University.

Twin test

Boyle's prototype runs on a PDA. It provides two tests, which take about 10 minutes to complete, and assess whether a person is too impaired to drive (see **Unfit to drive?"** below).

Her team tested the prototype at two music festivals this summer, where people who will admit to being impaired are relatively easy to find. With 170 volunteers, the researchers found a significant difference in performance between people who said they had not taken drugs and those who admitted to being under the influence.

The main purpose of the device is to detect people who are unfit to drive because they have taken illicit drugs, Boyle says. This is a growing problem in the UK, where 18 per cent of road casualties in 2002 were found to have traces of drugs in their bodies, compared with just 3 per cent 10 years ago.

The detector would deliver a verdict similar to the way a breathalyser indicates how much alcohol is in the blood, with positive, negative and a grey area between the two. Thresholds for these levels have yet to be set, says Boyle.

Lingering traces

As well as helping to screen people at the roadside, the test could help to solve some of the problems that arise from testing for traces of drugs in a driver's body. Cannabis, for example, lingers in the body long after its effects on behaviour have faded.

This allows drivers found to have residues of the drug in their blood to argue in court that they were not impaired at the time of driving. And with so many illicit drugs in common use, it is hard to devise a test that could pick them all up. Performance enhancing drugs do not enable impaired drivers to beat the test, says Boyle.

A spokesman for the UK home office says it is too early to comment on how such a device would be used or whether the results it produces would be admissible as evidence in court.

The prototype impairment detector runs two tests designed to assess three critical driving skills: motor control, ability to react to the unexpected, and concentration levels.

In the first test, volunteers are asked to use a stylus to track an object moving across the screen of a PDA, while every so often another object pops up in the corner of the screen. When that happens, the volunteers are required to press a button while continuing to track the moving object. This test assesses the subject's ability to perform a motor control task while their attention is diverted by unexpected events.

In the second task, road signs flash up on the screen every second. The driver has to respond to each of them, except a "target" sign that they have been told about at the start of the test. When the target flashes up they must not respond. This is known as a "sustained attention" task, and measures a person's ability to concentrate.

The tests were chosen from a wider battery of tests developed at the University of Surrey, UK, to assess the effect of drugs and sleep deprivation on people's ability to drive safely.

Graham Lawton

Eye test

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A new 90 second eye test could soon be used by companies to see if employees are too drunk, drugged or tired to do their job properly.

Much like the eye test in the movie *Blade Runner*, used to determine whether subjects are androids, subjects of the new test are asked to perform certain tasks during the examination.

But rather than being asked psychological questions, subjects are simply asked to follow a dot with their eye as it moves back and forth in a set pattern.

The test does not distinguish between different causes of impairment, says Charles Phillips, President of Eye Dynamics of Torrence, California, who developed SafetyScope. "It simply gives a single reading - yes or no". The company claims the test is 97 per cent effective.

Oscillating eyes

Twenty different parameters are measured during the test, relating to the position and reaction time of the eye and the size of pupil.

Even in healthy subjects the eyeball exhibits rapid, involuntary, oscillatory movements, a phenomenon called nystagmus. But as the subject's brain function becomes increasingly impaired these movements become more and more erratic.

SafetyScope uses an algorithm developed through thousands of trials with hundreds of people under the influence of heroin, marijuana, alcohol and exhaustion. The trials to compared their current reading with a baseline reading taken when they were first employed to determine whether or not that person was fit for work.

One of the advantages of SafetyScope, says Phillips, is that unlike blood and urine tests which only measure the presence of a substance in the body, the eye test takes into account the physiological effects of the substance.

"Invasion of privacy"

But some unions are less than happy about the development. An American Civil Liberties Union spokesman pointed out that even urine tests can be faulty and give inaccurate readings. Moreover the whole notion of testing employees is an invasion of privacy.

But Phillips believes it doesn't have to be. "We don't want to know if someone smoked some marijuana at a party over the weekend," says Phillips. "We just want to know if someone is fit for duty."

The system is now being tried out by the Louisiana Labour Station, an organisation that provides temporary labour to the petrochemical industry, testing people before they are sent out on jobs.

Phillips says his ultimate vindication would be to see the airline industry adopting SafetyScope, but he isn't holding his breath. If they started using it, it could be seen as an admission that a problem exists - it's a political mountain, he says.

More at: Eye dynamics

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