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Robots to the rescue 15 Sep 2001

A trundling droid could be first on the scene after a car crash

LUKE SKYWALKER'S "dustbin on wheels" may be coming to a highway near you. The R2D2 lookalike is designed to be first on the scene after a traffic accident, where its video camera and mini TV screen would allow stranded or injured people to talk to emergency personnel while waiting for human help to arrive.

The all-terrain wheeled rescue robot is part of a comprehensive "roadside response system" being developed by Mohan Trivedi and his team at the University of California, San Diego. Busy freeways in the US already have dedicated response teams, which clear smashed cars and other wreckage from accidents before they cause major snarl-ups.

Trivedi says his robots would speed things up by alerting the emergency services earlier. "If we can get emergency services to the scene just five minutes sooner, that translates to 49 lives saved per year on America's freeways," he calculates.

Pole-mounted cameras would monitor the road, sending video images to a roadside computer that scans them for crashes or signs of trouble such as a vehicle pulling onto the hard shoulder. When the system detects an incident, it attempts to work out what has happened-by assessing whether the people involved are waving their hands for help, for example, or kneeling to change a tyre. The system then alerts emergency services and deploys the droid, which trundles out of a roadside cabinet to investigate.

At 1.2 metres tall, Trivedi's robot-called Robotar-might sound a handy target for drive-by vandalism, but its incriminating built-in cameras may be a deterrent. These connect via a wireless link to the highway control centre. Robotar's on-board computer enables it to navigate around obstacles as it travels to its destination. To save power, Trivedi is considering dumber robots-ones that don't carry such sophisticated computers, but download instructions from a distributed computer network that gets its information from the roadside cameras.

Each roadside pole will sport two digital video cameras. The first will point at a convex mirror that creates an all-round, 360-degree view. Software developed by a member of Trivedi's group, Kohsia Huang, transforms the image into a flat panorama, which allows an operator to pan around the entire image electronically while the camera remains fixed.

The second camera is designed to handle detailed work. It can pan, tilt and zoom, and has high enough resolution to read a car's licence plates. Trivedi's student Brett Hall wrote software that seamlessly overlays the pan-tilt image onto the relevant portion of the image from the first camera, so that the user effortlessly switches between the two.

Traffic cops are impressed. Alex Jones, second in command at the California Highway Patrol, told *New Scientist* that the scheme could offer huge advantages. "Clearly there are limits to what you can do based on what you see on a camera, but the system would certainly give us a leg up in trying to ascertain the severity of the accident and making sure the right equipment and personnel are sent out."

Catherine Zandonella

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