

# Cars that 'think' MAY HELP DRIVERS WHO DON'T

STORY BY David Adams

**NOT TOO FAR** into the future, as you settle into the driver's seat, your car will be keeping an 'eye' on your speed and factors such as weather and road conditions. After taking into account prevailing traffic conditions, it may also suggest the 'greenest' route ... which won't always be the shortest one.

When low on fuel it will tell you where the nearest petrol stations are, which one has the lowest price that day and which might be offering your personal or corporate loyalty program bonuses. As you approach a pharmacy, it may even remind you to replenish any medication you have diarised.

These scenarios are examples of how future motor vehicles are likely to incorporate so-called 'context aware' systems, through which the range of applications will be limited only by imagination.

In the ongoing push to improve road safety and vehicle efficiency, and ease driving stress, automotive IT researchers are also exploring new ways in which intelligent cars can communicate with each other to improve spatial awareness and traffic management, and communicate with road system infrastructure to provide drivers with accurate, up-to-the-minute information about road and traffic conditions.

Jun Han, professor of software engineering at Swinburne University of Technology, leads a team of researchers who are exploring how, through 'talking' to road infrastructure and other vehicles, and via wireless connections to the internet, cars can be fed real-time information about road and traffic conditions. The cars automatically take this information into account to minimise emissions, increase safety and enhance the driving experience.

Professor Han envisages intelligent systems within vehicles integrating with city-wide intelligent transport systems aimed at ensuring an efficient flow of vehicles along major arterials and through city streets, and allowing for a more immediate response to situations such as accidents, while at the same time looking to reduce vehicle emissions on a city-wide basis.

"You could optimise traffic carbon dioxide emissions by investigating what-if scenarios

for traffic management," Professor Han says.

Such systems could see automated interaction not only between drivers and the road infrastructure, but between cars and public transport options such as trains, trams and buses, plus trucks and even systems managing pedestrians. Such integration would facilitate a significant step-up for transport efficiency and safety.

However, Professor Han says one of the critical challenges for the technology is to also make it as "distraction free" as possible, given concerns already being raised worldwide about the safety of current mobile devices such as phones, GPS guidance units and DVD players.

He says the requirements are dual: any such system must significantly reduce driver distraction while delivering automated driver assistance. This means the system needs to run independently of the driver and only communicate information when necessary.

Vehicle systems involving limited infrastructure information are already being trialled in some new, high-end cars, but Professor Han says they are far from reaching the level of sophistication that the researchers are proposing.

"However, we have prototype systems running that we can show to manufacturers or vehicle system providers," says Professor Han, whose team has been working under the auspices of

Australia's Cooperative Research Centre for Advanced Automotive Technology (AutoCRC). His team at Swinburne includes Dr Minh Tran, Dr Alan Colman and a number of PhD students.

AutoCRC research manager Dr Gary White says car manufacturers and electronics suppliers have a keen interest in developing context-aware systems within vehicles to improve safety and efficiency.

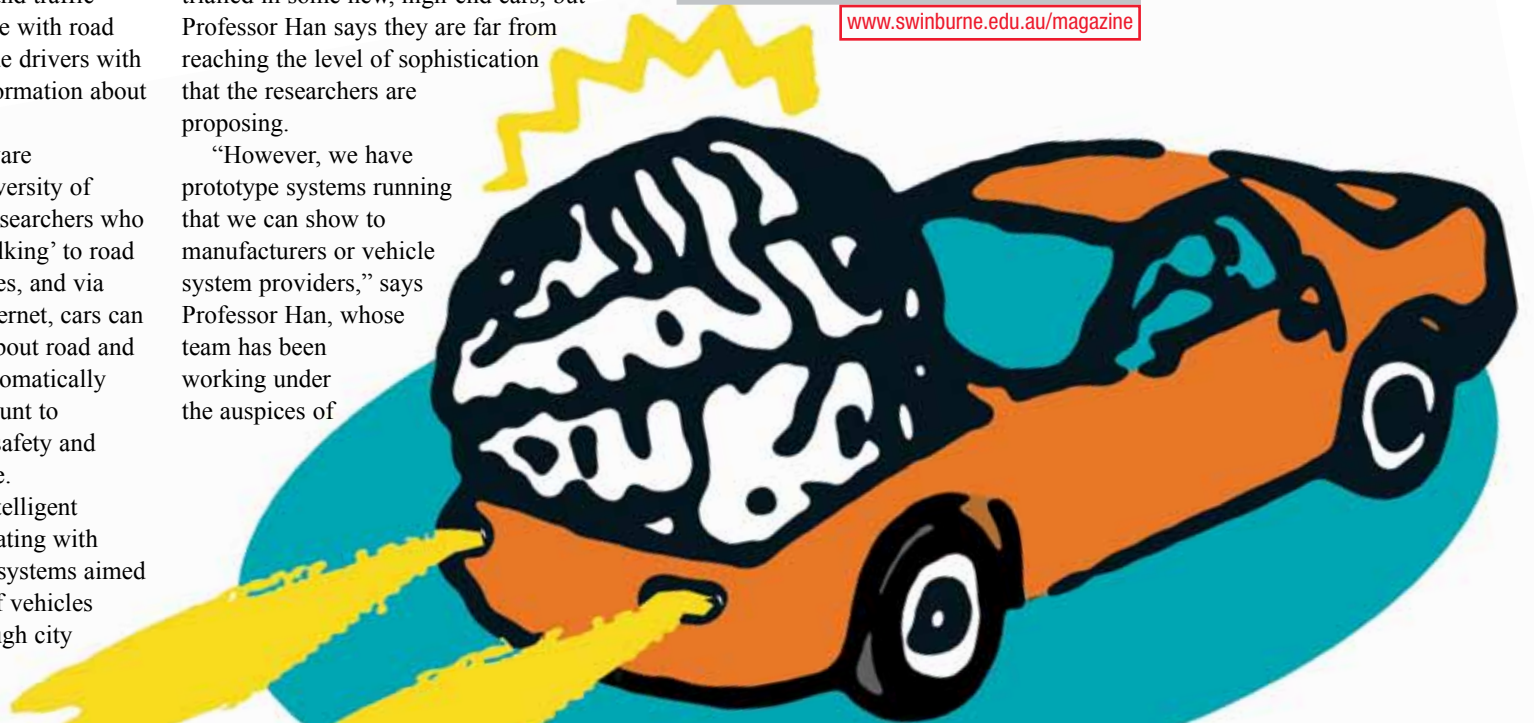
He says much of the focus is now on creating systems that are able to predict the driver's wants and needs, and deliver the most relevant information.

Dr White also emphasises the importance of in-car intelligent systems being distraction-free, but says that the introduction of smarter vehicle systems will ultimately evolve over the next few decades into producing fully autonomous vehicles. ■

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**Automotive IT researchers are taking the first steps towards building intelligent cars that may make the roads safer and less polluted.**