



Crash warning for connected cars?

European researchers recently demonstrated a system that makes a car aware of the position and trajectory of other vehicles, capable of providing several seconds warning of an imminent impact. Could this be the first, teetering step into the era of the 'connected car'?

It knows its location, can talk to other cars and can tell the future. Are we entering the era of truly automated cars? The Collision Warning System (CWS) is the brainchild of the Reposit project team. The researchers recently fired up a fully working prototype of their system.

The prototype finds its position using GPS, and can determine the position, speed and trajectory of neighbouring and oncoming traffic using an emerging car communication protocol called Vehicle2Vehicle (V2V).

The prototype can use that information to calculate the relative position of other cars, and then extrapolate where they will be in a few seconds' time. If the data predicts a collision, it warns the driver.

"So far, we've got predictions about one to three seconds ahead of a collision... but anything from two seconds up gives drivers time to react," says Jose Ignacio Herrero Zarzosa, Reposit's project coordinator. "It works better at medium-to-high speeds, above 50 km/h."

High-performance GPS systems, which can locate a car within a metre or so, perform far better than low-performance GPS systems. But even with poor GPS technology the Reposit team have managed to get warning times up to 1.5 seconds in a simulator, not too far from the useful minimum of two seconds. Zarzosa believes the system can do even better, with further work using vehicles' available sensors.

But the system does work, at least in a simulator, and that is a concrete result. The team has also perfected a simulator that other projects can use to model car collisions, another useful output. But will it be a success?





Unforgiving economics

It is possible, in time. Crucially, the system uses technologies, such as GPS and V2V, which are already becoming common or are emerging as a feature of modern cars. More and more cars come with GPS already installed, explains Zarzosa, and many owners are self-installing a GPS system, so for these cars Reposit takes advantage of the installed base.

V2V is an emerging standard for communication between vehicles, and so it will become more common as time goes by. The Rosetta stone of the system, the programme that ties all the devices together, is just software and so is relatively cheap.

The cost factor is very important. Keeping cost down is essential for any new car technology. The economics of the motor industry is unforgiving. "New car devices must be cheap if they are to be commercialised," notes Zarzosa.

The Reposit team also discovered that the rules for automobile innovation are unforgiving. Right now, there is no standard for integrating new functions into an existing car system. Every manufacturer uses different system integration methods. This factor significantly pushes up the cost of third-party technologies like Reposit, warns Zarzosa.

The European Commission reports that it is working hard on easing the burden of integrating new features through developing common standards.

So far, the car industry finds Reposit's work interesting, but remains unconvinced of the commercial application. The car industry is very price sensitive, notes Zarzosa.

Even so, the popularity of GPS, and the emergence of V2V as a standard, means that the system will become more attractive over time. Before long, drivers might take the first, tentative steps into the era of connected cars.

Project name:	Relative POSitioning for collision avoidance systems (REPOSIT)
Start-end date:	1 January 2006 – 30 June 2007
EU funding:	€0.6 million
Policy area:	research and technology, transport and energy
EU initiative:	eSafety Co-operative Systems for Road Transport
Reposit website:	www.ist-reposit.org