

Creating trust in driverless cars

The future of driverless cars depends on whether the industry can create reliable systems that make drivers feel safe. That is why an EU-funded project has been applying a human-centric approach to develop software that will reassure people using automated vehicles.



© Virtual Vehicle, 2016

The EU car industry expects automated vehicles to revolutionise transport, with companies spending huge sums on developing vehicles that can navigate traffic without human intervention.

However, recent studies in Europe and the US have pointed to consumer scepticism about our automated future. Many people are not convinced of the safety of driverless cars, with significant numbers saying they would be too scared to use one.

Such scepticism is one reason why the EU-funded project TRUSTVEHICLE is working to enhance trust in the next generation of automated cars – as well as driverless trucks and buses.

‘Automated driving is expected to have a huge impact on society. It intends to make driving safer since distractions – such as phone calls – no longer affect the car in the same way,’ says TRUSTVEHICLE project coordinator Daniel Watzenig of Virtual Vehicle, a research and development centre in Austria.

‘But, as long as the automated driving system does not reach a high level of reliability and the user doesn’t trust the system – either because of lack of trustworthiness or because of lack of consideration of the user’s expectations – the intended benefits will not ensue.’

The project has been looking into what the public expects from automated vehicles.

Researchers have gathered hundreds of survey responses – from several EU countries and Turkey – to find out more about what would make them feel safe when they do not have control, or during the transition phase when the vehicle passes control back to the driver.

By attaching 16 survey respondents to sensors inside a driverless car simulator, the project team has also been able to monitor stress levels in different urban, rural and highway driving scenarios. This has enabled researchers to analyse how a passenger's heartbeat, brain and eye activities respond to automated driving in day, night, snow, rain or when their vehicle is driving close to the car in front, for example.

Reassuring software

Responses to the TRUSTVEHICLE questionnaire showed that drivers in automated cars or trucks want a system that will tell them if their vehicle has any technical issues or system degradations. Consequently, the project is developing a device that will monitor and assess the perception system in automated vehicles, which includes cameras and radar, checking for any malfunctions, coming up with countermeasures and clearly informing the driver if she or he needs to take back control.

However, that has introduced another dilemma – how will the car communicate with the driver? Is the driver more likely to trust a car that speaks or communicates via a screen with video? TRUSTVEHICLE is trying to answer these questions so that it can develop a new human-machine interface that will communicate enough information to make the driver feel safe and informed but not overwhelmed.

Research with industry impact

'These development processes take into account findings from the user questionnaires, dealing with expectations and worries of the drivers, so that those expectations can be fulfilled, and worries can be addressed properly,' says Watzenig.

'The industry is currently spending a lot of money on research and development for autonomous cars because we believe it will be a huge step forward in terms of safety, efficiency and comfort. But if people do not trust the systems, no one will buy these vehicles,' he concludes.

Once TRUSTVEHICLE has reached its conclusions, its research findings and the tools being developed could impact up to 1 million vehicles produced by the project consortium, which includes four car manufacturers as well as SMEs, suppliers and research institutions.

Watzenig adds: 'TRUSTVEHICLE's contribution on the industry will be significant as we are creating more trustworthy and reliable systems.'

Project details

- Project acronym: **TrustVehicle**
- Participants: **Austria (Coordinator)**, France, United Kingdom, Finland, Turkey, Italy, Sweden
- Project N°: 723324
- Total costs: € 4 998 903
- EU contribution: € 4 998 903
- Duration: June 2017 to May 2020

See also

Project website: <http://www.trustvehicle.eu/>

Project details:
<https://cordis.europa.eu/project/rcn/210917/factsheet/en>

View the article online:

http://ec.europa.eu/research/infocentre/article_en.cfm?artid=50268

© European Union, 2019

