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New research project for safer autonomous vehicles

As functions in vehicles become increasingly advanced, new demands are made for agile working methods in the automotive industry. Semcon is a partner in a new research project funded by Vinnova which aims to devise analysis methods and processes for continuous development of safe connected and automated vehicles.

Considering a car finished when it leaves the factory is something of an outmoded approach nowadays. Vehicle systems will need to be updated and gradually improved as we learn more about how safe autonomous operation actually works.

“We hope the results from this research can be applied as soon as possible. Stringent demands are made when working with agile development and continuous updates of complex, safety-critical functions, and working methods in the automotive industry need to change as a result. This is something we want to help with,” says Fredrik Warg, project manager and senior researcher at RISE.

This new research project funded by Vinnova involves nine companies and research organisations, and its objective is to devise new approaches and working methods to support agile development of safety-critical systems, in particular connected and automated vehicles. The results will be presented in the form of scientific articles.

Machine learning in safety-critical applications

Semcon is participating in all six of the project's subprojects and is responsible for one of them; the subproject focusing on the demands that have to be made of vehicle components that involve machine learning [ML]. The use of ML algorithms in Autonomous Driving [AD] applications presents many challenges from a safety perspective. Industrial doctoral student Jens Henriksson at Semcon specialises in this. In this project, he will be examining questions such as: How do we define safety-critical requirements in respect of ML, and how should we meet these requirements? Can we train sensor systems to detect routes without obstacles, instead of detecting obstacles in the road?

Man and machine working together

Semcon is also contributing experts in User Experience [UX] and behavioural sciences. The autonomous systems will require continuous updates, so it is

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important to consider the human aspect as well: how will people react to cars suddenly being able to drive themselves in environments where this was not possible the day before?

“When it comes down to it, our research is all about resolving a number of safety challenges that are absolutely crucial to deal with if we are to see autonomous vehicles on our roads at all,” says Stig Ursing, Senior Safety Expert at Semcon. “We are pleased and proud to be able to contribute our expertise to this vital work.”

The emphasis in this project is on road vehicles, such as cars and lorries, but one of the subprojects is also focusing on other autonomous vehicle types used in restricted areas such as mines, ports and airports – something that Semcon has extensive experience of working with thanks to its [Applied Autonomy](#) offering.

About the SALIENCE4CAV research project

SALIENCE4CAV stands for “Safety lifecycle enabling continuous deployment for connected automated vehicles”. This project is partly funded by Vinnova as an element in its cooperation programme FFI – Strategic Vehicle Research and Innovation. The project is headed by RISE and will be taking place between January 2021 and June 2023. Project partners are Agreat, Comentor, Epiroc, KTH, Qamcom, RISE, Semcon, Veoneer and Zenseact.

[Find out more about SALIENCE4CAV.](#)

[Find out more about Semcon's work on autonomous vehicles.](#)

[View the licentiate thesis by industrial doctoral student Jens Henriksson on the topic of verification of deep learning in safety-critical applications.](#)

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