

Self-driving truck acts like an animal

May 25 2016



The self-driving truck is closely monitored on the Astazero test track in west Sweden. Here, it is being monitored by Chalmers researcher Ola Benderius. Credit: Henrik Sandsjö

Researchers at Chalmers University of Technology are finding inspiration in evolution's biological counterparts in the development of a driverless truck. The first public demonstration of the vehicle will take

place on a Dutch motorway on 28 May. That's when the truck will take part in a competition for autonomous vehicles, within the framework of an EU project called the Grand Cooperative Driving Challenge.

The truck is a Volvo FH16 and is in the newly launched Chalmers laboratory: Resource for Vehicle Research (Chalmers Revere). The researchers are currently preparing the truck for its first demonstration, which will be on the A270 motorway between Helmond and Eindhoven in the Netherlands. This will take place within the framework of the Grand Cooperative Driving Challenge, an EU project and collaborative competition in which 10–15 universities compete against each other with [autonomous vehicles](#).

Chalmers researcher Ola Benderius, the team leader, explains that the traditional – and clearly dominating – way of developing vehicles is to constantly base progress on earlier vehicle models and gradually add new functions. He says that this method might not work when developing the autonomous vehicles of the future.

"Traditionally, the aim has been to try to separate and differentiate all conceivable problems and tackle them using dedicated functions, which means that the system must cover a large number of scenarios. You can cover a large number of different cases, but sooner or later the unexpected occurs, and that's when an accident could happen," says Ola Benderius.

His team of researchers have instead chosen to regard the self-driving vehicle as a completely new type of vehicle. A vehicle that is more like an animal, a biological organism, than a technical system.



The Chalmers team working on the self-driving truck. Back row: Ivo Batkovic, Johan Bergström, Björnberg Nguyen, Mauro Bellone, Fredrik von Corswant, Ola Benderius. Front row: Björn P Mattsson, Mats Svensson. Credit: Christian Berger, Arpit Karsolia, Federico Giaimo. Photo: Henrik Sandsjö

"Biological systems are the best autonomous systems we know of. A biological system absorbs information from its surroundings via its senses and reacts directly and safely, like an antelope running within its herd, or a hawk pouncing on its prey on the ground. Before humans walked the earth, nature already had a solution, so let's learn from that," says Ola Benderius.

He explains that the research team is working towards achieving a transport revolution like when the horse was replaced by the motor car in

the early 20th century. All information that the truck compiles from sensors and cameras is converted into a format that resembles the way in which humans and animals interpret the world via their senses. This enables the truck to adapt to unexpected situations in its basic design.

Instead of just one large program with dedicated functions for all conceivable situations, the team is working on small and general behavioural blocks that aim to make the truck react to various stimuli, just like an animal does. The truck is programmed to constantly keep all stimuli within reasonable levels, and it will even continuously learn to do this as efficiently as possible. This makes the framework extremely flexible and good at managing sudden and new dangers, according to Ola Benderius.

"We are trying to design a system that adapts to whatever happens, without pointing to specific situations – and this is something that even the simplest animals can usually do better than existing vehicle solutions."

The software, OpenDLV (which stands for driverless vehicle), is being developed as [open source code](#) and is freely available on the internet. Through this, Ola Benderius and his project group hope that other researchers around the world can join the project by running and developing the software in their own vehicles. OpenDLV is intended to serve as an academic platform for researchers in many different scientific disciplines, such as vehicle engineering, adaptive systems, computer science and engineering, perception, neurology, and biology, where they can exchange knowledge about how autonomous vehicles should be made to enable their safe, large-scale introduction into society.

Provided by Chalmers University of Technology

Citation: Self-driving truck acts like an animal (2016, May 25) retrieved 3 July 2024 from <https://phys.org/news/2016-05-self-driving-truck-animal.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.