An Artficial Intelligence Platform for Automated Vehicles

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Implementing artificial intelligence in automated vehicles follows different development paradigms than the traditional design of embedded systems. With much of the function not realized by explicit programming, but rather by automated code generation resulting from training with extensively labeled data sets, the question arises what kind of tools and development systems need to be available for this implementation. We will introduce a framework and tooling infrastructure that covers the entire development process: from data collection to labelling support to advanced forms of machine learning and system deployment. We focus on issues of validation, as much of the automatically generated software is safety-critical, and address automated simulation as a key aspect of this validation before any system finally hits the road. But we also present a detailed view on the resulting embedded software and hardware platform for automated vehicles.

Ralf G. Herrtwich runs automotive software development for NVIDIA in Germany where he can draw upon his long R&D experience in vehicle automation, infotainment and telematics. He currently focuses on the market deployment of artificial intelligence applications for autonomous vehicle perception and control as he is responsible for the delivery of NVIDIA solutions to German automotive OEMs and suppliers.

A computer scientist by education, Dr. Herrtwich started his career in academia at TU Berlin and UC Berkeley. He then held management positions with IBM and several telecommunication start-ups before joining Daimler in 1998 to manage its advanced engineering on telematics, infotainment and, later, driver assistance and chassis systems. Since 2010, he led the development of self-driving vehicles for Mercedes-Benz. In 2013, his team made an S-Class re-enact the world's first overland drive, covering the historic 65-miles Bertha Benz Route autonomously in regular traffic. From 2016 to 2019, after the acquisition of HERE Technologies by Daimler, BMW and Audi, he was appointed to HERE's leadership team to steer the development of navigation applications, location-based online services and high-definition maps for automated driving.

Since 2009, he also is honorary professor for vehicle information technology at the Technical University of Berlin. In 2019, he was named Fellow of the German Computer Science Society in recognition of his contributions to artificial intelligence in vehicle automation.