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**Prof. Dr.-Ing. Prof. h.c.
Dr. h.c. Torsten Bertram**
Robotics Research Institute,
Institute for Control Theory and
Systems Engineering, Technical
University of Dortmund

A Role for Robots in Automated Driving Systems

Globalisation, urbanisation, connectivity and individualisation are some of the forces that are shaping the future of transportation. This can be seen in the innovative development of automated driving systems and the enthusiasm of the researchers and engineers involved in this development. The successful testing of driverless vehicles has also inspired lawmakers to allocate resources to secure critical development programs. Moreover, mass media outlets have raised the visibility of the development by devoted considerable attention to innovative driver-assistance systems and the testing of driverless vehicle prototypes. Regrettably, the successes are sometimes diminished by reports of accidents and navigational miscalculations on the part of the chauffeurs made of hardware and software.

The development of automated driving systems has so far not taken sufficient account of the human passengers. For instance, many questions about the interplay between passengers and autonomous vehicles have not yet been answered or even appropriately formulated despite the fact that safe transportation will depend on a degree of continuous system transparency for both passengers and autopilots. This transparency is a basis for the human passenger's capacity to reliably predict and control the autonomous vehicle in the interest of greater safety. This applies as well to the autopilots with regard to passenger behavior. But how are we to prepare human passengers for interaction with autopilots? What forms of individual training will be necessary?

Autonomous vehicles can be expected to come at a certain price. Mature consumers with the right buying power will presumably number among the initial customers, in part because they can be expected to value the comfort of safe, automated mobility in their own vehicles. The demographics of the situation point to both to other challenges and other solutions. One way to extend the autonomy of humans in their private environments is to provide them with technical assistance. Applications in the field of robotics that have many parallels to automated driving systems are being developed to accommodate this need. Robots need to be able to navigate in their environments.

The fact that mature consumers may one day be able to make it more smoothly through life with the assistance of robotic systems suggests a role for robots at the steering wheels of self-driving cars. Operating in the capacity of a chauffeur, the robot would represent a case of diverse redundancy in the control of various functions. However, the notion of robotic assistance also seems to suggest that the increments along the continuum from partial to full automation may be skipped altogether owing to a lack of system transparency for all participants.

Cars will one day be automated or autonomous, but presumably later and in a different form than we expect. Let's direct our questions about the details to the millennials.