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Putting People Center Stage

Automated systems are performing more and more of the tasks that were previously carried out by manual workers. These tasks had often put people's safety at risk and also caused them discomfort. One example of these automated systems are autonomous vehicles, which in years to come will take over partial or full responsibility for driving and will relieve people of the work involved in controlling the car. However, in the case of partially autonomous vehicles in particular, it is clear that people, both in the vehicles and in their surroundings, will continue to play an essential role in ensuring that our roads remain safe and that traffic flows smoothly. Therefore we need not only to improve the functions of the automated vehicles, but also to find a people-friendly design for the sociotechnical system that consists of the person in the car, the surrounding traffic, and the partially autonomous vehicle itself.

Studies carried out by our organization indicate the relevance of the surrounding traffic. In our presentation at the 4th ATZ conference Driver Assistance Systems in April in Wiesbaden, Germany, we will be explaining this in more detail. In these studies, drivers encountered autonomous vehicles which behaved in a way that they did not expect, despite the fact that it was predictive. The automated car was equipped with a traffic signal assistance system that

informed the car of the time remaining before a signal turned red or green. This allowed the car to adapt its speed in order to save time and money. However, this type of behavior led to negative emotional reactions such as frustration among the drivers in the vehicles behind and also to safety-critical situations. This is not surprising, because frustration is caused when purposeful behavior is obstructed and can lead to attempts being made to overcome the obstruction in the short term by aggressive driving. In the long term, frequent frustration can also reduce drivers' acceptance of systems of this kind.

The German Aerospace Center (DLR) has developed solutions that will help to avoid the negative consequences of automated vehicles. These include enabling the systems in the car to identify and interpret human emotions by recognizing changes in facial expressions and to offer user-focused assistance to compensate for negative emotions and counteract the consequences of inappropriate behavior. Only when automated systems can correctly identify and predict human thoughts, emotions, and behavior will they be able to interact and cooperate with people in a way which ensures that the sociotechnical system as a whole functions safely and effectively. This is all about putting people at the center of the process of developing system functionality.