ADAS for the Communication between Automated and Manually Driven Cars

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Abstract:

With the increasing development of automation in traffic, the automated vehicle seems to be within reach. However, with this upcoming technology several problems arise. As long as the automated vehicle is in its infancy, there will be mixed traffic on our roads. Whereas cars equipped with the new technology will have the possibility of sharing and exchanging various information, conventional vehicles will lack an interface for this information exchange. In order to make a step towards the interaction between automated and manually driven cars an assistance system for a manually driven car is developed, implemented and evaluated. It serves the purpose of enabling manually driven cars with the ability to receive, understand and distribute information provided by automated cars to the human driver via an intuitive HMI. Finally, it might avoid critical traffic situations in which human drivers misunderstand or misinterpret the behavior of automated cars. In order to follow the recommendations and information of the assistance system, the acceptance and the trust in such an ADAS is a prerequisite. Therefore a user study is conducted focusing on the willingness of drivers to cooperate with automated cars. Furthermore the intuitiveness as well as the distraction is investigated in the user study. Since the interface is important for the user acceptance, two interaction systems, gesture control and touch control, are compared and evaluated regarding the usefulness, satisfaction and trust.

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