

# Assistance for car drivers: prototyping via a simulator study

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## **Abstract**

To improve comfort and road safety more and more Advanced Driver Assistance Systems (ADAS) enter the car. These systems must concentrate on user needs. For this purpose, assistance components were developed to analyse the driving situation (e.g. time headway or potential dangerous situations like road accidents) and to provide adequate support. In this study an ADAS on longitudinal control that either informed and warned the driver or intervened was considered.

The starting point is not primarily the system functionality but rather the user who has to interact naturally with a dynamic distributed system. Such assistance scenarios were defined based on general assistance concepts and on human action stages when performing a task. The assessment of these scenarios led to the implementation of different versions of the assistance system. Then subjects had to perform driving tasks during a simulated drive on a virtual course. Using this method, important usability measures (acceptance and effectiveness) could be compared. In general it was found that the higher the assistance grade the higher is the road safety. In conditions with bad visibility and when considering the amount of critical situations any form of assistance helps to avoid dangerous situations. The acceptance study showed that the automatically reacting systems were more accepted than systems informing only, although most of the drivers demand to keep control of their vehicles.

## **Introduction**

Technological systems play an increasing role in the ongoing development of the society. However, this only holds as long as the user is able to use the systems. In order to guarantee effective systems which truly support people in using the technology, usability aspects have to be taken into account in a very early phase of the development process, especially in the case of assistance systems supporting the user in risky situations.