

CarUSE – Developing a framework for IVIS evaluation

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Abstract

Usability and driving safety are key aspects when evaluating human-machine-interfaces (HMI) of advanced in-vehicle information systems (IVIS). A central aspect of IVIS evaluation is the potential to distract the driver from the task of driving. Inattentiveness and distraction can have a critical influence on driving performance (stabilization, manoeuvring) especially when the primary task (driving) and the secondary task (operating the IVIS) use the same cognitive resources. Using existing methods to evaluate human-machine-interaction in an automobile in combination with accepted human performance models, the Technische Universität Berlin is developing a methodological procedure that can be used to test advanced driver information systems in early periods of the development cycle. This paper will describe the first steps in the development of that procedure and report the primary results of a feasibility study used to estimate the objectivity and utility of existing methods of IVIS evaluation. Moreover, it was tested to what extent certain assumptions of the “15-second rule” (Green, 2000) are applicable for such a procedure.

Introduction

Advanced in-vehicle information systems have become essential products of the automobile industry. Consequently, specific requirements for the design of the automotive human-machine interaction (HMI) have to be met in order to combine all single systems and functions into a holistic concept of interaction. The ergonomic principles of human-machine interaction, the psychological and physiological characteristics of the driver, and the definition of the driving task and traffic situation mark the external parameters, which need to be considered when designing human-machine interaction as well as advanced driver assistance systems (Timpe, et al., 2002).

CarUSE: On the way to an evaluation toolbox

Beyond the pure functionality of in-vehicle information systems, usability and safety requirements have to be addressed. Guidelines for the design of cockpits and automotive systems have already been developed by industry as well as legal authorities. So far, no standardized method has been established to describe and evaluate the HMI of a vehicle. Nevertheless, certain significant efforts have led to a

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