

Automotive User Interfaces

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1 New Challenges in Human Computer Interaction

Components that include processing, communication, sensing and media are common in many areas in the automotive domain. With these novel technologies, creating attractive in-car user interfaces has become a great challenge and a means for showing innovation. Additionally, users expect interfaces that are intuitive and straightforward to use, without the need to read a manual or undergo lengthy training. The overall experience in driving a car is more and more influenced by the man-machine interface, and hence creating a compelling user interface is of great importance for a successful product.

Traditional means for user interface development as known from desktop computing are often not suitable, as many other conditions have an influence on the design space for automotive user interfaces. In comparison to many other domains, trial and error while the product is already in the market is not acceptable as the cost of failure may be fatal. Especially user interfaces for the primary driving task are very different and hence introducing new approaches is difficult. One reason is that the UNDO concept that has made many applications successful in the desktop world is often not applicable as actions are performed in the physical environment.

2 Research Topics for Automotive UIs

In the workshop, a variety of the following topics has been discussed and research that addresses many of these challenges and topics has been presented. In particular we see innovations in the following areas.

- new concepts in-car user interfaces
- multi-modal car user interface
- methods and tools for automotive user interface research

- approaches for the evaluation of novel car user interfaces
- novel multimedia interfaces and in-car entertainment
- speech interfaces for in-car use
- user interfaces for navigation systems
- use of in-car sensors for context-aware and adaptive functions
- detection and estimation of user intentions

Current research shows that user interface research in the automotive domain is relevant across many areas ranging from primary driving control, to assisted functions, to navigation and entertainment and safety.

3 Aim of the Workshop

In the workshop we brought together researchers, developers, practitioners and students from academia and industry who are concerned with envisioning, creating and implementing automotive user interfaces. This first workshop on automotive user interfaces at the Mensch und Computer Conference at the Bauhaus Universität in Weimar has become a venue to present novel research in this field and to discuss ideas and problems on the topic. We hope this workshop is a first step towards foster a community that has interest and expertise in the domain of automotive user interfaces. The included papers were peer-reviewed by the workshop program committee. We like to thank the authors for submitting the work and the program committee for their valuable comments. Automotive User Interfaces Workshop program committee and organizers:

- Klaus Bengler, BMW Group Forschung und Technik
- Susanne Boll, Universität Oldenburg
- Andreas Butz, Ludwig-Maximilians-Universität München
- Verena Broy, BMW Group Forschung und Technik
- Alois Ferscha, Universität Linz
- Hans Gellersen, Lancaster University
- Stefan Graf, BMW Group Forschung und Technik
- Gerhard Hanrieder, Harman/Becker Automotive Systems GmbH
- Paul Holleis, Nokia Research Center, Helsinki Finland
- Heinrich Hußmann, Ludwig-Maximilians-Universität München
- Dagmar Kern, Fraunhofer IAIS

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- Reinhard Klein, Universität Bonn
 - Antonio Krüger, University of Münster
 - Klaus Schaaf, AutoUni, Volkswagen AG
 - Albrecht Schmidt, Fraunhofer IAIS and B-IT University of Bonn
 - Henning Schröder, Harman/Becker Automotive Systems GmbH
 - Nhu Nguyen Thien, Siemens VDO Automotive AG
 - Michael Weber, Universität Ulm