



Third International Conference on Automotive User Interfaces and Interactive Vehicular Applications

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ICT&S Center, University of Salzburg
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ADJUNCT PROCEEDINGS WORKSHOP „SUBLIMINAL PERCEPTION IN CARS“

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Message from the Workshop Organizers

Introduction

The aim of this workshop is to discuss the potential and possible application of subliminal techniques employed to counteract the problem of limited cognitive abilities and bounded attention of a driver. To alleviate the cognitive load associated with the interaction with the variety of emerging IVIS/ADAS in addition to the driving task, we assume that subliminal techniques offer high potential to significantly reduce the amount of information to be processed simultaneously. These cues should be provided using appropriate modalities (visual, auditory, tactile/haptic, olfactory, etc.), following the specific nature of the task to fulfill, and according to a driver's abilities.

As research and discussion on subliminal techniques would benefit from a significant collaborative effort from a range of disciplines like engineering, neuroscience, computer science, psychophysiology, we have invited researchers from these fields to submit their position paper. We are sure that the approach provides exciting challenges, which will significantly impact on society at large, making significant contributions toward a more natural, convenient, and even a relaxing future style of driving.

Summary of Contributions

The position papers submitted to the workshop of "Subliminal Perception in Cars" have undergone a rigorous peer-review process where the manuscripts were reviewed by two to three reviewers each. In the end, 6 position papers were selected for the publication in the workshop proceedings and presentation/discussion at the workshop, held November 30th, 2011 in the frame of the 3rd International Conference on Automotive User Interfaces and Interactive Vehicular Applications.

The first paper by Peter Sinclair presents a very interesting concept, Road Music, for a dynamic music generator conditioned by the driving style and road environment. The approach differs from commercial products in that it does not make use of audio tracks that are selected according to driving parameters, but instead alters the melody parameters such as pitch, tempo and tone based on multitude parameters. This will probably spark quite a few interesting discussions/debates over the subliminal perception of automated, real-time, generated music.

The next paper by Jeon and Walker provides a good review of how to design unobtrusive affect detection and mitigation systems in the area of in-car interaction from a cognitive/psychological point of view (concluding most profound ways are speech and facial detection). This paper would "drive" further discussion at the workshop with the subject matter.

The position paper by Angela Mahr focuses on research exploring the possibilities of the use of speech and sped-up speech for in-vehicle contexts. The paper is suitable for the workshop because it treats with one of the natural and unobtrusive communication ways, namely "speech". Moreover, sped-up or compressed speech is one of the well-known subliminal process examples in psychology. The "Semantics" approach of the author seems to be a plausible way and worth investigating further and the authors' previous work using a robust cognitive psychology experimental paradigm has been nicely wrapped-up to proceed with discussion in the workshop.

The fourth paper by Andreas Riener gives an interesting presentation of possible subliminal techniques and their application in the car, enriched with critical assessment of consequences of affect on driving. Interesting is the reference of the two possibilities for displaying the drivers affect. Visible, for example

on an emotion-gauge, or in a more unobtrusive way by an adaptively display. In particular, the details given about information processing and the capabilities of the diverse sensory channels could add a interesting view on the discussion at the workshop.

The next paper by Joseph Fellner describes the core research interests of AUDIO MOBIL, an internationally acting automotive system supplier and system service provider, in the field. The company focuses on HME (human-machine-environment), HMI (human-machine-interaction), vehicle-to-X-communication, driver assistance systems and car infotainment. With regard to the workshop, AUDIO MOBIL is mainly interested in the field of infotainment and entertainment for a driver and passengers. Including the “view” of the industry, not only its wishes and recommendations, but also criticism and concerns would direct the discussion at the workshop to a “more realistic” and goal driven route.

The last paper presents a driving simulator experiment with different visual stimuli related to vehicle speed. This research corresponds to the workshop in that it provides an unobtrusive cue in the peripheral visual area. When it comes to subliminal perception, people are likely to think about non-visual modalities, such as auditory or tactile displays. However, the provision of the information in peripheral vision might be an alternative method instead of that in the focal vision area. This research is expected to enrich the workshop discussion in terms of adding a typical (but not usually considered in a subliminal perception domain) modality.

Conclusion

The authors of this workshop have shown very diverse approaches of how to implement or apply subliminal persuasion and perception in driver-vehicle interaction. We believe that this cross-section of research projects and industry interests in the broader field of subliminal perception in cars illustrates the potential application of subliminal techniques holds to improve driver-vehicle interaction or driving experience. Nevertheless, it also highlights that there are still technical difficulties and unresolved problems limiting a broader deployment in the near future.

As a concluding remark, we would like to thank all the authors and reviewers for their excellent work.

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