From a Driver-centric towards a Service-centric Lens on Driverless Cars

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Abstract
Within qualitative interviews we examine attitudes towards driverless cars in order to investigate new mobility services and explore the impact of such services on everyday mobility. We identified three main issues that we would like to discuss in the workshop: (I) Designing beyond a driver-centric approach; (II) Developing mobility services for cars which drive themselves; and (III) Exploring self-driving practices.

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Self-driving, User Experience, Service Design, Ethnographic Research

ACM Classification Keywords

Personal Information on the Authors
Gunnar Stevens is a professor of Information Systems at the BRSU and senior researcher of Human Computer Interaction at the University of Siegen, Germany. He is well-known for his research in the fields of End User Development, Technology Appropriation, and Sustainable Interaction Design. From this stance, he is interested in driverless cars as a mosaic stone on the way towards a sustainable, post-private car society.

Johanna Meurer is a scientific assistant and PhD student in Information Systems and New Media at the University of Siegen, Germany. She is experienced in

the interaction design of multimodal mobility platforms and eco-feedback for mobility contexts. Her research focus lies on an ethnographic understanding of ICT-supported mobility.

Christina Pakusch is a scientific assistant at the Bonn-Rhein-Sieg University and PhD student at the University of Siegen. Her field of research is in the area of sharing and service economies and sustainable development with a focus on future mobility.

Paul Bossauer is a scientific assistant at the Bonn-Rhein-Sieg University and PhD student at the University of Siegen. His field of research is Smart Data, new business models and privacy issues raised by the new options for collecting mobility data.

Motivation to Participate

With expanded transport systems and multiple mobility services, western societies like the USA or Germany can be considered mobile in various respects. Although this is illustrated by diverse mobility modalities (e.g. hitching a ride, taking a bus etc.), the private car still represents the main mode of transport. However, such monomodal mobility based on private motor vehicles does not satisfy the requirements of individualized lifestyles, the complexity of mobility needs, and the demand for sustainable societies. In contrast, multi-optional offers seem to be better suited and gain greater popularity [5].

From this stance, automated driving vehicles have become a highly interesting research subject. They can, for instance, help to improve the safety and fuel-efficiency of manual driving [10]. Vehicles which drive themselves completely also enable entirely new mobility services which affect the choice and use of the transportation options available [6] [2].

Self-driving cars are mainly addressed within technological, legal, political, and ethical issues [9]. Most studies adopt a driver-centric lens leaving many potential areas unexplored while still focusing on the current paradigm of driver-car interaction [7] [8] [3] [1]. In order to address the full potential of self-driving in the future, our research aims to investigate a wide range of possible new mobility services and the impact of such services on everyday mobility.

In our first qualitative study we interviewed n=20 people about their concerns, ideas, and desires with regard to various options of using cars which drive themselves (e.g. as private cars, car-sharing, taxis, etc.). Our first tentative findings show that the fear of losing control, not having so much fun, and liability issues were major concerns affecting the acceptance of private cars which drive themselves. However, when asked about self-driving taxis, these issues became much less relevant with economic factors playing a major role. For instance, a taxi driven automatically would be preferred to a traditional taxi (with a driver), if it were cheaper than the traditional one.

Within our service design lens, we would like to explore and discuss the following issues in the workshop:

- **Beyond driver-centric design: Implications for a service-centric lens of user experience design**

Firstly, our tentative findings indicate that a user's experience is not determined by technology alone but also

by the specific context of the transport mode and the particular service in which it is embedded. This has design and research implications, too. For instance, we as designers have to consider whether a *driving-my-car experience* (having fun, being in control etc.) or a *taking-a-taxi experience* (leaning back, delegating the work etc.) should be provided. This has an impact on the material design, e.g. the design of the passenger cabin, but also on the symbolic design, e.g. the labeling as a lean-back experience.

- **Mobility services for cars which drive themselves: Designing business models and impact assessment**

Secondly, the findings indicate that, so far, driverless taxis have great potential. With regard to this, we want to discuss how HCI research can contribute to designing "self-driving" services. In addition, it is reasonable to expect that self-driving cars will have a large impact on the labor market as far as taxi drivers are concerned. We therefore want to discuss new challenges for value-sensitive and participatory design to envision socially acceptable self-driving services.

- **Exploring self-driving practice: Understanding everyday life to envision the future**

Thirdly, this new and highly explorative research field is accompanied by fresh methodological questions. One of the main challenges facing user research is the lack of experience with self-driving cars and the limited options for testing them, which is why we are interested in a methodological discussion on how to deal with these restrictions. Further, studies like [4] make people aware of the increased potentials of self-driving cars for particular user groups and settings, such as for older people in rural areas who might profit from innovatory taxi services. However, these potentials remain, as yet, still underexplored.

Further remarks

All the authors are greatly interested in using the workshop to share their experience with others and for getting in contact with researchers and practitioners from various domains concerned with self-driving cars. This includes a discussion on new services, and how we can face upcoming challenges. We are further interested in methodological issues and human factors.

We would like to participate in the pre-workshop program (i.e. visiting Google Partnerplex and Stanford University one day prior to the workshop) with 1-2 persons.

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