

Where are we bound for?

Persuasion in Transport Applications

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Abstract. Due to its interdisciplinary nature, research on persuasion in transport applications is fairly scattered across communities as diverse as psychology, transportation science, computer science and automotive user interfaces. We would like to take this workshop as an opportunity to achieve a first step towards a systematic overview of the field of persuasion in transport applications. The aim of this workshop is thus to bring together people with interest in persuasion and/or automotive research and to discuss, share knowledge, and take away insights, strategies, and tips of how to use persuasive technology to improve the driver-vehicle interaction loop. We are covering both i) theoretical work focusing on theories and models, modalities, and strategies and ii) practical work/design studies toward optimal applications for vehicle environments (behavior change, social interaction, cooperative self organization, gamification approaches/serious games, incentives, etc.).

Keywords: Persuasion, Multi-modal transport chains, Future transport, Serious games, Behavior change.

1 Introduction and Motivation

We can expect a very exciting time for the transport field, with two main areas of research: First, the application of cooperative strategies between the various entities involved in traffic (technology and non-technology enabled), and second, the transition from manual to automated driving. Persuasive technology has the potential to push the field forward, e.g., by applying methods to lessen selfish behavior and thus, to establish cooperative self organization. Furthermore, using gamification approaches or incentives, it is expected that the transition between different levels of control in partial automation and the co-existence of manual and automated cars can be made smoother and safer.

The safety, efficiency and ecological impact of transportation systems is dependent on the attitudes and behaviors of their users. People often have the choice between different routes and transportation modalities, they have certain driving styles, and they will have various attitudes towards concepts like car sharing and semi-autonomous driving. Persuasive Technology, that is, interactive information technology designed for changing users attitudes or behavior [1], has shown to be effective also in many areas of transport, demonstrated for example by a large EU FP7 project “MyWay” (<http://myway-project.eu>, last accessed November 29, 2015) or many other related works, e.g., [5], [4], [2], [6]. Due to its interdisciplinary nature, research on persuasion in transport applications is fairly scattered across communities as diverse as psychology, transportation science, computer science and automotive user interfaces. We would like to take the Persuasive Technology 2016 conference as an opportunity to achieve a first step towards a systematic overview of the field of persuasion in transport applications.

To this end, we need to have a general consensus on (1) what to persuade (the goal state), and (2) how to persuade (methodologies, modalities, and strategies), and thus we can design (3) optimal applications for vehicle environments. To achieve (1) what to persuade, more data need to be systematically archived from across multiple disciplines. To better know (2) how to persuade, we may need to go beyond the traditional conceptualization about the relationship between driver and vehicle. One of the directions could include making computers (in our case, “vehicles”) more social. For example, Salah et al. [3] shows that the role of pervasive systems is “*(to support) change from a passive observer to a socially active participant that influences people’s attitudes and behaviors, by providing support in goal selection and acquisition*”. Even under this assumption, we can think of different strategies (e.g., social interaction between a driver and an intelligent transportation system, extension of the driver’s social interactions with other “people” by utilizing a car’s networking and other capabilities, etc.). To design (3) optimal in-vehicle applications, these efforts can evolve with the rapidly changing situations of the transport industry (e.g., intelligent transportation systems, instrumented road infrastructure, connected vehicles, semi/full autonomous vehicles, etc.).

2 Topics of Interest

To discuss all these aspects in the workshop, we have qualified topics of interest as follows.

I. Theories and Models

- (a) Theories and models in Psychological, Cognitive, and Affective Sciences about i) motives, rewards, incentives, reinforcements and ii) behavior modification
- (b) Theories and models in Affective Computing
- (c) Theories and models in Positive Design/Technology/Computing

- (d) Direction: Persuasion for long-term vs. short-term behavior adaptation
- (e) Ethical issues: What is the direction of persuasion, who decides it?, etc.
- (f) Trust: Persuasive technology or manipulative technology

II. Modalities and Strategies

- (a) Speech-based dialogue between driver and car
- (b) Implicit/subliminal/unobtrusive/ambient driver-car communication
- (c) Multimodal interactions (visual, auditory, haptic, gesture; combinations)
- (d) Reminder and preventive strategies
- (e) Gamification of behavior modification technologies

III. Applications in Vehicle Environments

- (a) Intelligent means of transportation
 - i. Promote fuel efficient driving
 - ii. Detect and prevent or mitigate i) fatigue driving, ii) emotional driving, iii) use of mobile phone while driving
- (b) Social cars
 - i. Provide collective knowledge about driving skills and traffic pattern
 - ii. Promote car pooling
- (c) Autonomous vehicles
 - i. Persuade the driver based on social networks (other people's opinion), rather than a car
 - ii. Expand the driver's social abilities by initiating a contact with other real people, by using a car
 - iii. Persuasive technology to support the transition between different levels of control in partial automation
 - iv. Application of persuasive technology (serious games) to establish cooperative self organization (i. e., lessen selfish behavior)

3 Organizers

Andreas Riener is a professor for Human-Machine Interface and Virtual Reality at Ingolstadt University of Applied Sciences, Germany with more than 10 years of experience in automotive UI's and novel in-car applications and more than 100 publications in the field. His current interest is in the future of mobility and he is the main organizer of a prestigious Dagstuhl seminar on "Automotive User Interfaces in the Age of Automation" (June 2016).

Myounghoon "Philart" Jeon is an assistant professor of Cognitive Science and Computer Science at Michigan Tech. He directs the Cyber-Human Systems Center at Tech. His Mind Music Machine Lab conducts research on automotive interfaces, affective computing, auditory displays, and assistive technologies, which has led to more than 130 publications and numerous awards. He was a professional automotive UX designer and led many industry projects.

Peter Fröhlich is a senior scientist at AIT, where he leads a team of researchers dealing with Personal Value-enhancing Experiences. His research interests include user experience and mobile spatial interaction, as well as persuasive technologies for sustainable and privacy-aware behavior. He has contributed as organizer and committee member to renowned conferences and journals, such as the Journal of Personal and Ubiquitous Computing, Mobile HCI, Automotive UI, and CHI.

Alexander Meschtscherjakov is an assistant professor at the Center for HCI at the Computer Sciences Department of the University of Salzburg. In his research he deals with automotive interaction design and persuasive technologies in various domains. He was co-chair of conferences (e.g., AutoUI'11) and organizer of workshops (e.g., AutoUI'13-15, CHI'15, PT'14).

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