Novel on-board user interfaces for fostering trust in self-driving cars

Master thesis/Exjobb
Mobile Services Laboratory
Communication Systems

Task
The technology supporting self-driving vehicles has reached substantial maturity and some initial features for automating specific driving tasks are currently being rolled-out in the market. The level of reliability at the technical side is however not matched by the perceived traveling experience at user side. Recent studies have shown that a large majority of potential users do not trust self-driving vehicles. This critical “disconnection” between passengers and the AI software powering the vehicles depends on the fact that currently there are no effective means for humans to interact with the onboard AI.

The goal of this Master Thesis project is to design an innovative onboard user interface and evaluate its capability of fostering passengers’ trust in self-driving vehicles. In order for information to be available when and where the passengers require it, advanced visualizations will be used to provide passengers with information from the AI, while eye-gaze tracking will be used to control the input from the passengers.

Such novel visual interface needs to enable users to:

- understand which environmental information has been registered by the system,
- know what are the currently planned driving decisions,
- influence the driving decisions/style.

Part of the work will require building a testbed to perform user studies.

Competence
We are looking for a motivated MSc student who has fulfilled the course requirements for the degree project. Good knowledge of image processing and computer programming is required, as well as a basic knowledge of machine learning. In addition, we require good spoken and written English.

Application
Applications should include a brief personal statement, CV, and a list of grades. In the application, make sure to mention previous activities or other projects that you consider relevant for the position. Candidates are encouraged to send in their application as soon as possible. Suitable applicants will be interviewed as applications are received.

Start time: As soon as possible
Location: KTH, Kista, Stockholm

Mobile Service Laboratory
The Mobile Service Laboratory at the Department of Communication Systems' overall aim is to foster innovation, education and research in mobile services. The lab is pursuing the study, design, benchmarking, and evaluation of mobile applications and their associated services.

Self-driving Cars Interfaces for the Establishment of Trust (SCIET)
The SCIET project aims at designing and validating a set of novel onboard interfaces for self-driving vehicles. These interfaces will be bridging the information gap between humans and the AI softwares in the vehicles. The Thesis will be run in cooperation with the project’s partners: Ericsson and Universidade Federal de Minas Gerais (UFMG).

Contact
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