

Collaborative Perception in automated transportation through IoT technology for safeguarding VRU protection

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Abstract

As automated features begin to permeate the market and the possibility of full automation becomes more likely, it is essential to both review potential impacts on traditionally vulnerable populations as well as reimagine vulnerability under this emerging market.

With regard to the safety of highly automated cars, their continuous development and implementation raise new issues in traffic research, as e.g. the effect of automated vehicles on the driver and the surrounding traffic participants. For the efficient implementation of such technologies, it is therefore a prerequisite to offer a safe and sustainable shared mobility environment.

During the last decade a large number of IoT technologies have been developed by the research community. These technologies empower IoT researchers and solutions providers to develop and deploy novel IoT applications in key application areas. Such an area is highly automated driving, where it is expected to highly benefit from IoT services, especially in controlled environments, both for technological advancement of the vehicle automation per se but also on emerging business perspectives.

The Internet of Things (IoT) will become increasingly important in transportation in the next several years, especially as autopilots and self-driving cars come to the foreground. The IoT will contribute to collect additional data from other vehicles and/or road side infrastructure, complementing the data already collected by on-board vehicle's sensors and traffic management centres. This data, exchanged along the roads and on the Internet, will be useful to develop new services, making vehicles safer for drivers, passengers, and other road users. IoT will enable drivers to be given accurate real-time information on road and weather conditions sourced from other vehicles already encountering those conditions.

The overall objective of the AUTOPILOT project is to bring together relevant knowledge and technology from the automotive and the IoT value chains in order to develop IoT-architectures and platforms which will bring Automated Driving towards a new dimension.

One of the project focused studies is to investigate the interaction and coexistence of highly automated cars with vulnerable road users, especially on pedestrians and cyclists. Potential conflicts between automated vehicles and pedestrians in shared traffic spaces, like parking

places or public points of interest, need to be identified and solved in a collaborative way; the knowledge on the intention of the vulnerable road users in traffic situations play an important role in this context. This is therefore addressed in this study as collaborative perception.

This abstract aims to present the collaborative perception concept enabled through an IoT platform at a controlled touristic environment. This platform will both target the development of innovative algorithms for calculating the intentions of the vulnerable participants, and the necessary required wearable platform (using off-the-self wearables such as smartphones, smart glasses, smart watches, etc.) that will communicate with the automated cars through IoT-based technology available through the infrastructure.