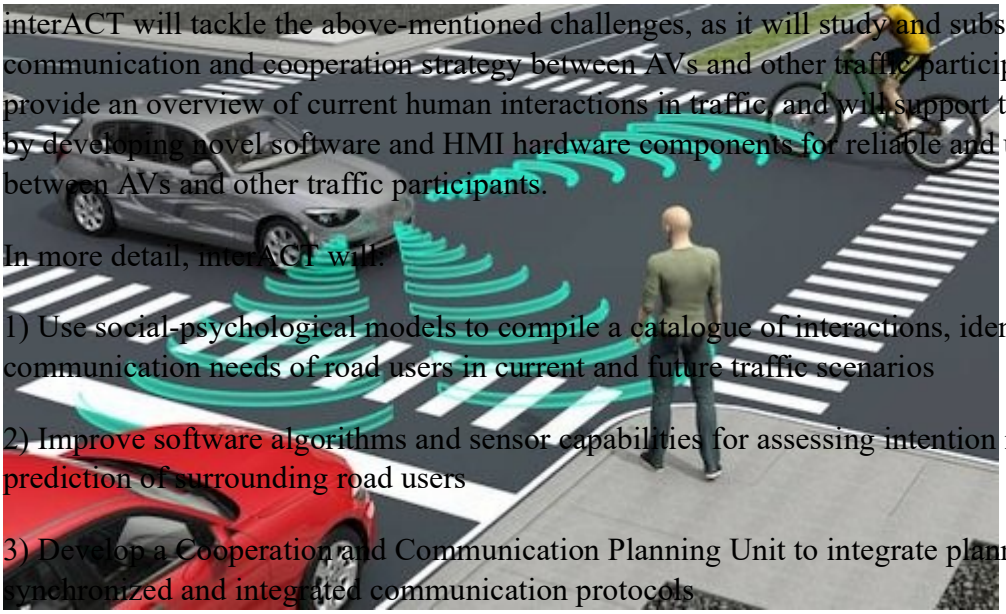
interACT

Designing cooperative interaction of automated vehicles with other road users in mixed traffic environments

A new EU project has started to study the necessary interactions between automated vehicles (AVs) and traffic participants in the future transport networks.

Over the next three years, the project interACT will develop novel, holistic interaction concepts for AVs, that will enable the integration of AVs in mixed traffic environments, in a safe and intuitive way. The project, which consists of 8 partners from 4 countries, officially launched its activities with the organisation of the consortium kick-off meeting that was held in Braunschweig, Germany on 4-5 May 2017.

Automated Vehicles (AVs) are expected to start being deployed in mixed traffic and for this they will need to interact safely and efficiently with other (non-equipped) users, including drivers of manually-driven vehicles, cyclists and pedestrians. Currently, these vehicles cannot communicate their intentions to other road users, and this limitation reduces the capacity for intuitive and cooperative interaction between the AV and others, and the smooth traffic flow. Moreover, other traffic participants are currently not familiar with the presence of AVs and need to adapt to this new reality in a way that will ensure safety, especially during the transition period.



interACT will tackle the above-mentioned challenges, as it will study and substantially improve the communication and cooperation strategy between AVs and other traffic participants. interACT will provide an overview of current human interactions in traffic, and will support the safe deployment of AVs by developing novel software and HMI hardware components for reliable and user-centric communication between AVs and other traffic participants.

In more detail, interACT will:

1) Use social-psychological models to compile a catalogue of interactions, identifying the main communication needs of road users in current and future traffic scenarios

2) Improve software algorithms and sensor capabilities for assessing intention recognition and behaviour prediction of surrounding road users

3) Develop a Cooperation and Communication Planning Unit to integrate planning algorithms, providing synchronized and integrated communication protocols

4) Ensure safety of road users by developing easy-to-verify software for a safety layer, and novel methods for fail-safe trajectory planning.

Prototypes will be developed and evaluated in multi-actor simulators and two test vehicles, assessing their ease-of-use, acceptance, safety and reliability. The impact of this successful communication on traffic safety, traffic flow and acceptance of AVs by the society will be investigated.

interACT is expected to have strong impact on road safety, on usability and acceptance of AVs, on validation procedures for AVs and on the European competitiveness of vehicle manufacturers.

The Institute for Transport Studies team will investigate the interaction requirements of road users in the UK, using a mixture of observational and simulator-based studies. The current interaction strategies of pedestrians, cyclists, and drivers will be explored through observations and interviews at key locations in Leeds. Innovative automated video analysis techniques will enable the categorisation of typical interaction behaviours, and the development of behavioural models. The University of Leeds simulators will be used to design and evaluate various solutions for increasing the communication capability of AVs, based on the outcomes of the observational studies. A user-centred approach will be adopted, and any communication strategies developed will be tested to ensure appropriate levels of user understanding, acceptance, and trust.

Contacts for further information

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Project Facts

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Partners:

- Bayrische Motoren Werke AG (BMW Group), Germany
- Centro Ricerche Fiat SCpA (CRF), Italy
- Hella KGaA Hueck & Co (HELLA), Germany
- Institute of Communication and Computer Systems (ICCS), Greece
- Robert Bosch GmbH (Bosch), Germany
- Technische Universität München (TUM), Germany
- University of Leeds (UNIVLEEDS), United Kingdom

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