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interACT

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

PROJECT FACTS

Start Date:
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41 months
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5.527.581€

PROJECT COORDINATOR

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consortium

Deutsches Zentrum für Luft- und Raumfahrt
German Aerospace Center (DLR)

BOSCH Invented for life

HELLA

CRF

ICCS

UNIVERSITY OF LEEDS

Technical University of Munich

interACT objective

Achieve a safe, highly accepted and efficient integration of Automated Vehicles into mixed traffic environment

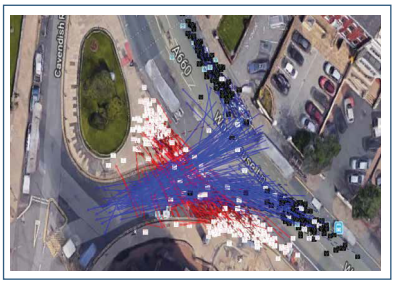
The results

Results - Evaluation methodologies

1. Evaluation criteria and methodologies derived for Automated vehicles **2.** interACT demonstrators evaluated in test-track studies, while eHMI/iHMI solutions were also evaluated using driving and pedestrian simulator **3.** Impact assessment carried out to understand the effects of the interACT solutions on safety, traffic flow, criticality, comfort, and acceptance

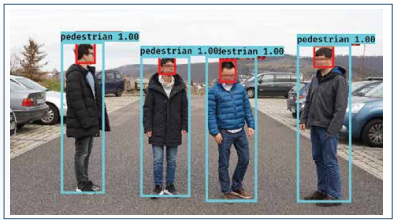
Results - HMI/eHMI

1.Two interaction strategies defined: intention-based & perception-based strategy for HMI/eHMI **2.**Two eHMI technologies developed and implemented: 360° Light Band & Directed Signal Lamp **3.**Two iHMI technologies: Light Band & Automation Display



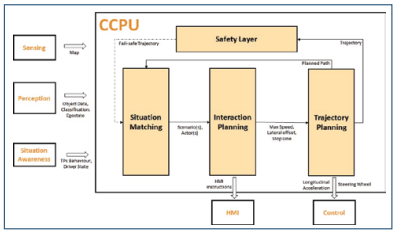
Results - Human interaction behaviour

1. Definition of interaction terminology **2.** Several observation studies on human-human interaction in Greece, Germany and the UK **3.** Traffic participants tend to avoid conflicts; Interactions are more likely to occur when the vehicle is driving slowly; Pedestrians mostly focus on implicit vehicle cues rather than explicit communication



Results - Intention recognition

1. Risk analysis framework for the prediction of traffic participants location **2.** Pedestrian intention prediction using the semantic map and behaviour models of other traffic participants **3.** Novel deep learning techniques, for classification of pedestrians' head orientation and hand waving gestures **4.** Hidden Markov model for vehicle maneuvers recognition and generation of intention-aware trajectory. **5.** Extended vehicle prediction trajectory via fusion of intention-based with typical motion-based



Results - Communication and Cooperation Planning Unit

1. Recognition of traffic conflicts between Automated Vehicles and other traffic participants **2.** Implementation of reaction strategies according to the identified situation (future path constraints, candidate actors for HMI/eHMI interaction) **3.** Integration of internal and external HMI to enable human-like interaction **4.** Development of safety layer for emergency situations

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