interACT – Project overview

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Project facts

• **Programme:** EU/H2020-ART04 - *Safety and end-user acceptance aspects of road automation in the transition period*

• **Duration:** 36 months

• **Period:** May 2017 – April 2020

• **EU Funding:** 5.527.581 €

• **Coordinator:** Anna Schieben, DLR

• **Partners:** 8 industrial and academic partners from 4 European countries (Germany, Italy, Greece, UK)

• **Project Officer:** Begona Munoz (INEA)

• **US - EU twinning project:** AVIntent (NHTSA)

This project has received funding from the European Union’s Horizon 2020 research and innovation programme
Integrating automated vehicles in mixed traffic

Situation Today

On-board driver

interact

Other traffic participants

Future situation: Automated vehicles in mixed traffic environments

On-board user

interact

Vehicle automation

interact

Other traffic participants

H2020 RTR/Brussels Nov 2018

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The challenge
Achieve a safe, highly accepted and efficient integration of Automated Vehicles in mixed traffic environment

1st Objective
Psychological models

2nd Objective
Intention recognition & behavioural predictions

3rd Objective
CCPU & safety layer

4th Objective
Novel HMI elements

5th Objective
Methodology for assessing the quality of interaction
1st Objective: Psychological models – results achieved

- Observational studies successfully conducted in three EU countries
- Data used:
  - to refine user requirements for the design of explicit and implicit communication strategies for AVs
  - to improve the situation assessment algorithms of the AV by providing a set of communication signs and behaviours intuitive to humans;
  - to design suitable algorithms for the CCP Unit which ensure the AV behaves in an intuitive expectation-conforming manner
- Further details: https://www.interact-roadautomation.eu/cad-webinar-series-ix-interact-project/
2\textsuperscript{nd} Objective: 
Intention recognition & behavioural predictions

• Tracking system, which covers 360 degree around the ego vehicle (laser scanner, radar sensors, stereo video cameras)
• Intention recognition and behaviour prediction incl. gesture recognition
• Extension of the time horizon for reliable prediction from 1-2s, as is the case with physics-based prediction models today, to ≥3s for pedestrians
• Inclusion of smart phone data for behaviour prediction
3rd Objective:
Cooperation and Communication Planning Unit & Safety Layer

- The CCP Unit is responsible for managing the time-synchronised, integrated planning of explicit communication message (on-board and external HMI) with the behaviour of the AV
- Software components under development for situation matching, interaction planning and trajectory planning


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4th Objective:

**Novel HMI elements**

- Provides research and solutions on how to design interaction strategies required for the three-way cooperation between all agents
- Under development:
  - 360° LED light band
  - Directed single lamp
  - On-board HMI LED band and additional displays

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Upcoming objectives and results
The challenge

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The challenge
5th Objective:

Methodology for assessing the quality of interaction

- Measuring cooperation capabilities of AVs with other road users is a completely new area of research.
- Develop methodologies required to measure and quantify how the on-board user, the AV and other road users establish and use each-others’ intentions and behaviour
- Impact assessment and safety and user acceptance
Expected or potential impacts

- Impact on easy-of use and user acceptance of automated vehicles
- Impact on societal changes in the traffic environment
  - Traffic safety
  - Traffic flow
  - Changes in Mobility
- Impact on validation procedures for automated vehicles
- Impact on leadership position of EU vehicle industry (standardization and product innovations)
Thank you

Any questions?

http://interact-roadautomation.eu

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