connected automated driving.eu

Designing cooperative interaction of automated vehicles with other road users

25 September 2018

CARTRE and SCOUT are funded by the European Union Horizon 2020 Work Programme

Agenda

Topic	Presenter
interACT project & system architecture for automated vehicles interacting with other road users	**Anna Schieben**, interACT Project Coordinator **Robert Markowski,** WP 3 Department of Automotive, German Aerospace Center (DLR)
Advanced pedestrian intention recognition for automated vehicles interactions	**Johannes Ruenz**, BOSCH
Recognizing the traffic situation: Rule-based reasoning in combination with ontology representation	**Dr. Evangelia Portouli**, Institute of Communication and Computer Systems
Questions & Answers	

The EU project interACT

Anna Schieben, DLR

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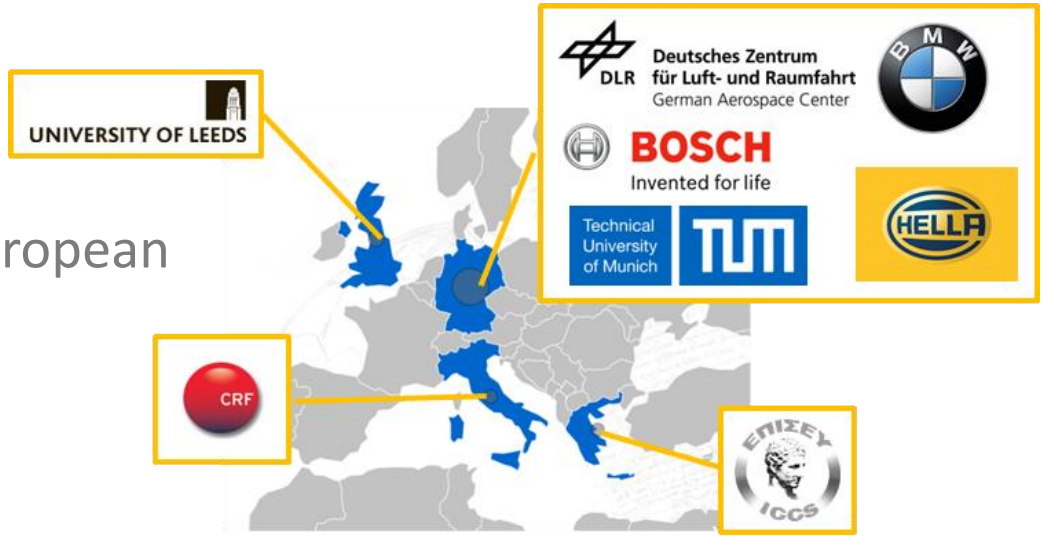
interACT Project Facts

- **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:** Begoña Munoz (INEA)
- **US - EU twinning project**: AVIntent (NHTSA)



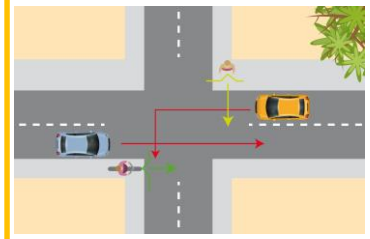
Integrating automated vehicles in mixed traffic

The challenge

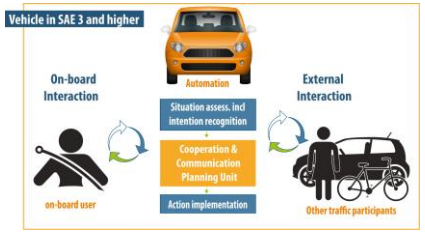
Achieve a safe, highly accepted and efficient integration of Automated Vehicles in mixed traffic environment

1st Enabler
Psychological models

2nd Enabler
Intention recognition & behavioural predictions



3rd Enabler
CCPU & safety layer



4th Enabler
Novel HMI elements

5th Enabler
Methodology for assessing the quality of interaction

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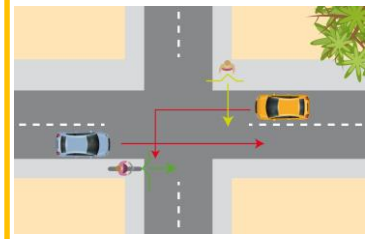

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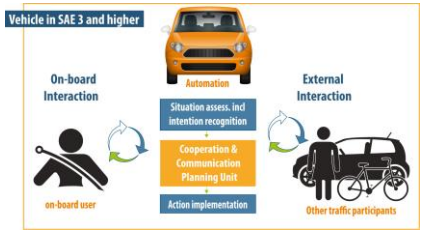

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System Architecture for Automated Vehicles Interacting with other Road Users

Robert Markowski, DLR

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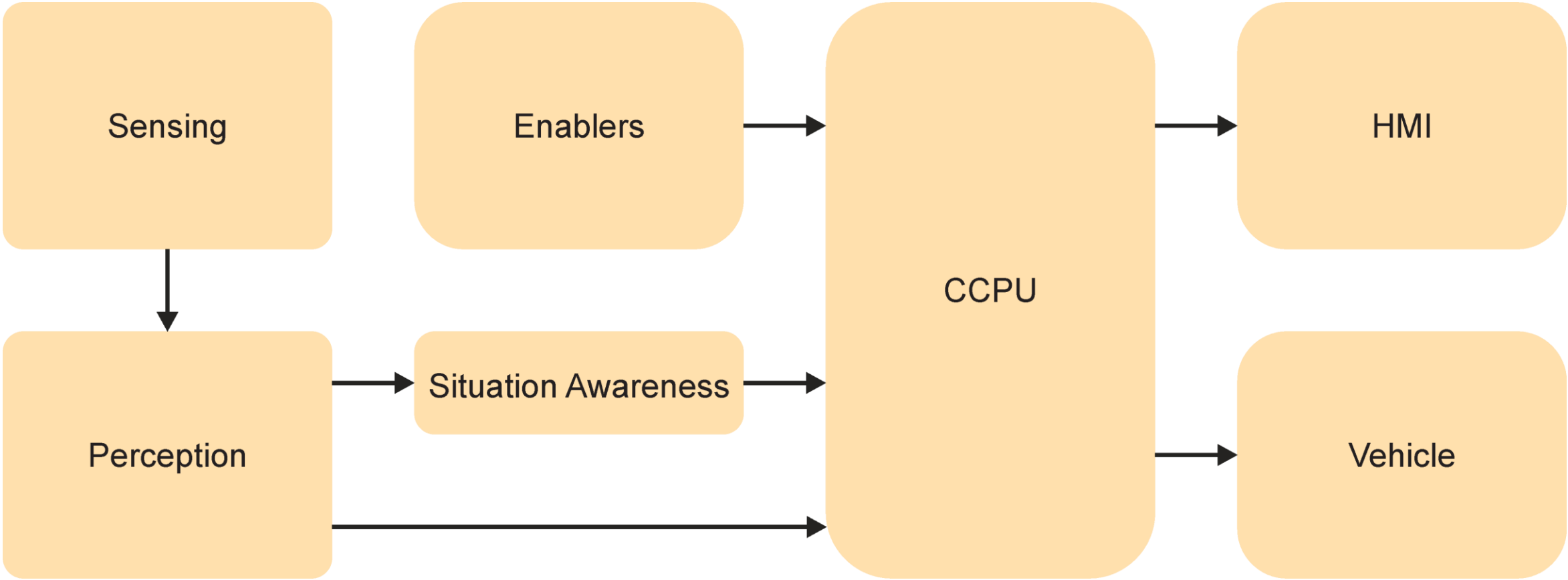
Agenda

1. Highlevel Architecture
2. Robot Operating System
3. Component Description
4. CCPU Functionalities

Highlevel Architecture



Middleware: Robot Operating System (ROS)

- different components are communicating with each other
- publisher-subscriber pattern
- messages define interfaces
- encapsulating components
- programming languages: C++, Python and Java

Sensing & Perception

Sensing

- Localisation Sensors
- Object Detection Sensors
- Cooperative Sensors

Perception

- Localisation
- Traffic Participants Tracking
- Static Obstacle Detection
- Pedestrian Intention Feature Recognition
- Dynamic Object Classification
- Motorised TP Intention Feature Recognition

Situation Awareness & Enablers

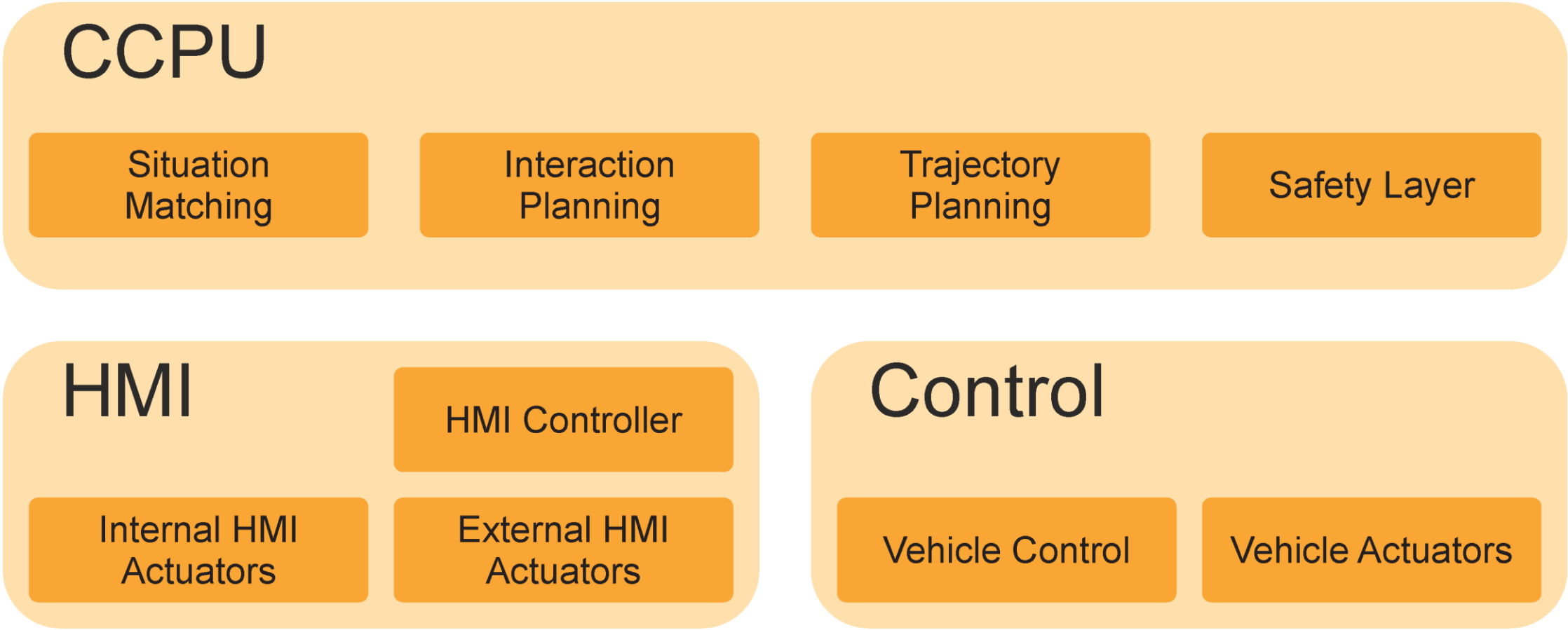
Situation Awareness

- Traffic Participants Behavior Prediciton
- On-Board User Monitoring

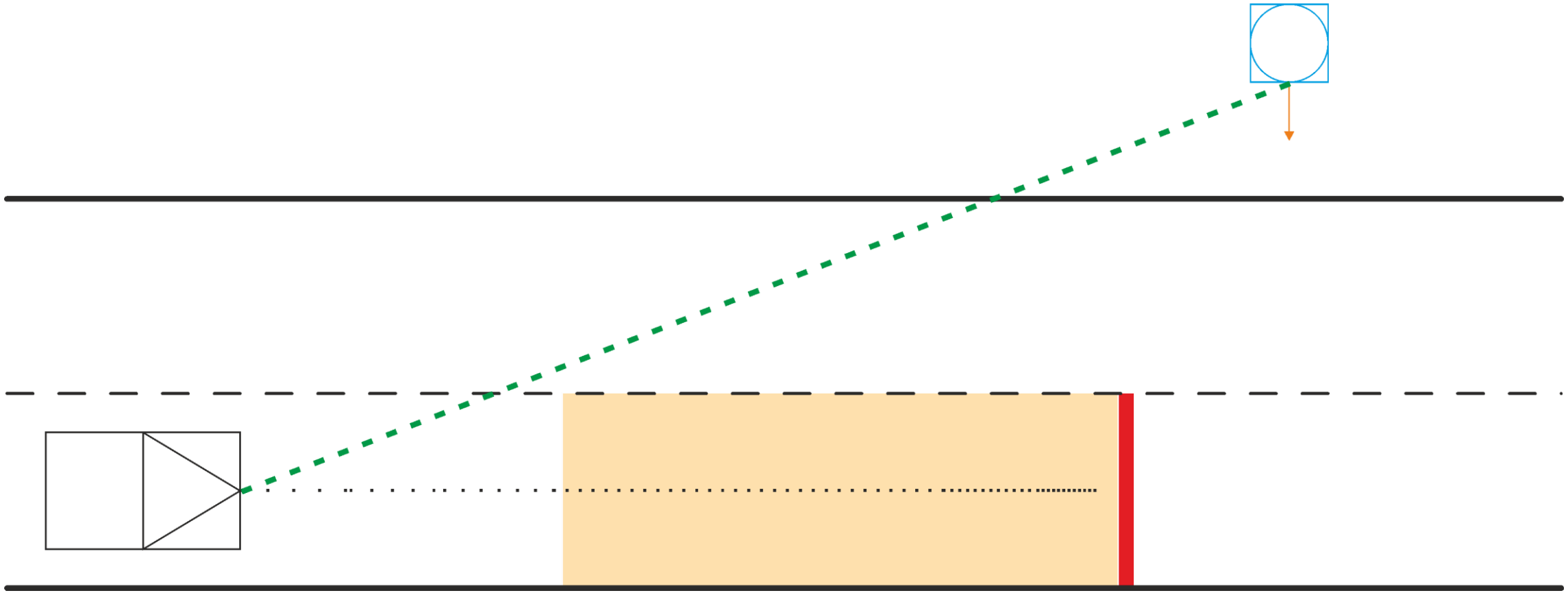
Enablers

- Scenario Catalogue
- Interaction Strategies Catalogue

CCPU, HMI & Control



Interaction Planning:
Integrated Planning of Internal and External Communication



Safety Layer:
Ensure Safe Behavior in Emergency Situations

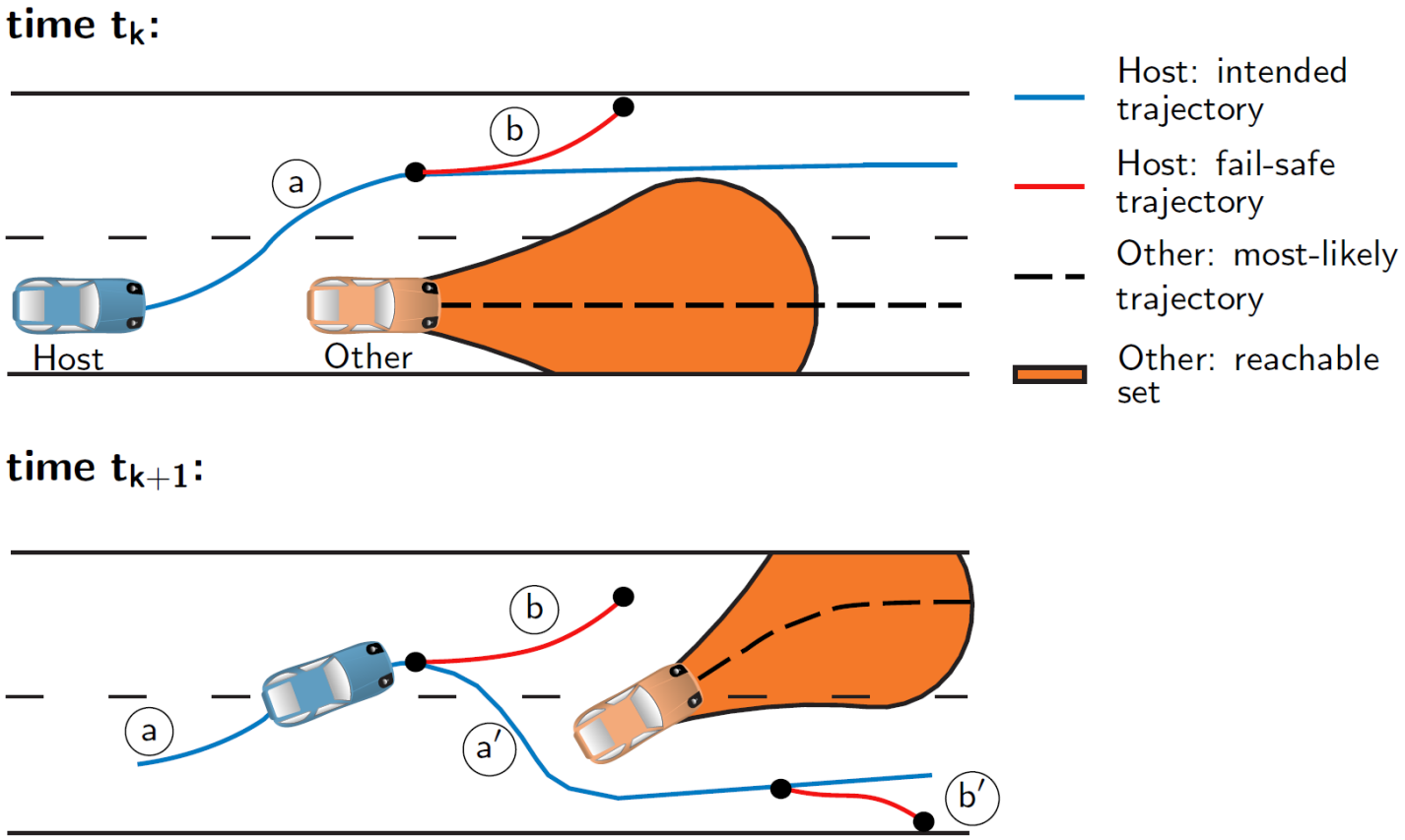


figure from interACT D3.1