interACT Work Package 2
How Do Traffic Participants Interact in Current Urban Scenarios and How this Helps when Designing Automated Vehicles

Motivation
Automated vehicles (AVs) will soon be introduced onto urban roads but road traffic will never be fully automated. In the future, we must ensure that the AV can interact with other road users in an intuitive, expectation conforming manner.

The EU-Project interACT aims to enable the safe integration of AVs into mixed traffic environments by designing, implementing and evaluating solutions for safe, cooperative and expectation conforming interaction of the AV with both its on-board user and other road users.

Methodology
Observations of traffic situations in Leeds (UK), Athens (Greece) and Munich (Germany) were conducted to analyze current road user behavior, using videos, LiDAR, eye-tracking, questionnaires and observation protocols. The different observation methods were temporally synchronized to create a holistic understanding of interactions in current urban traffic.

For the observation, two locations with two use cases each were chosen:
- Non-signalized intersections
- Shared spaces

The observation focused on interactions between two vehicles as well as interactions between vehicles and pedestrians.

Results
Most notably, interaction occurs only if the velocity of the vehicle in right of way is below a certain threshold. This means that at higher velocities interactions are highly unlikely and automated vehicles will not need to communicate with other road users. Furthermore, drivers tend to be more cooperative whenever they are hindered to proceed at their intended pace. Therefore, AVs might need to adapt their behavior accordingly.

Different driving strategies implicitly give hints to other road users about the driver’s intention. For example, if a driver aims to let another vehicle turn on to his lane, he will open a gap, thus, signaling the willingness to cooperate.

Novel communication interfaces, so called external Human Machine Interfaces (eHMI), could enhance the interaction with other road users by communicating the automation’s intention early. This may lead to a faster understanding of the automation’s intention by the other traffic participants, which would potentially increase traffic flow.

Outlook
Interaction in traffic occurs today, which means that road users will expect AVs to behave in a comparable way. By using implicit and explicit communication automated vehicles could be introduced on to urban roads without disrupting accustomed traffic situations.

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Observation of Urban Traffic

Potential Communication of AVs

For further information, please visit: https://www.interact-project.eu