

Reliable in-Vehicle pErception and decisioN-making in complex environmenTal conditionS

At a glance

Full Title: Reliable in-Vehicle pErception and decisioN-making in complex environmenTal conditionS

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Coordinated by: Institute of Communication & Computer Systems (ICCS)

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Consortium



Description

EVENTS is a Horizon Europe project that brings together a complementary consortium of 12 partners within 6 EU Member States and UK, with the view to deal with complex situations where the normal operation of the Connected and Automated Vehicle (CAV) is close to be disrupted (e.g., due to dynamic traffic changes, harsh weather/light conditions, unstructured road, imperfect data, sensor/communication failures, etc.). These situations are called “events” and they are creating challenges for CAVs, that should be overcome in order to enable safe and reliable automated driving in such cases. An indicative, but non-exhaustive list of these challenges is the following:

- Perception in complex urban environments, in particular dealing with Vulnerable Road Users (VRUs);
- Perception in adverse weather and poor lighting conditions;
- Perception under (partial) occlusions;
- Accurate prediction of road user trajectory (especially if highly manoeuvrable, like VRUs);
- Utilisation of connectivity (off-board information) to improve accuracy, certainty & reliability of perception;
- Reduction of the costs of the required sensor-suites;
- Real-time decision-making and motion planning especially in uncertain situations;
- Self-assessment of perception systems.

EVENTS project aims to create a robust and resilient perception and decision-making system, able to tackle the abovementioned challenges. In EVENTS, in case the system or some of the subsystems cannot perform with the expected quality and reliability, an improved minimum risk manoeuvre is triggered. Within the scope of EVENTS project, and in order to cover a wide area of scenarios, the various types of “events” are clustered under three main use cases:

- Interaction with VRUs in Complex Urban Environment;
- Non-Standard and Unstructured Road Conditions;
- Low Visibility and Adverse Weather Conditions.

To achieve its objectives, EVENTS will bring together, adapt and improve technological advances, in perception and decision-making for real-time CAVs operation. As a summary, the major expected breakthroughs to be introduced by EVENTS project, are the following: i) the robust and reliable perception of objects, and especially VRUs, under complex urban traffic and bad weather or low visibility conditions, ii) the improved perception performance while using cost-efficient sensor suites and iii) the real-time decision-making for CAVs under non-standard traffic and unstructured road conditions.