

EDITORIAL

BRAVE is celebrating its first anniversary ! Since June 2017, all the partners have worked hard to achieve the first milestones of the project: literature review on the acceptance of automated driving, test drives with end-users, etc. The consortium is now planning even more testing, with a multi-country test across the EU to be processed in May and June 2018.

Those twelve months have been dedicated to establishing the framework of BRAVE, mandatory to ensure a smooth and relevant implementation of the forthcoming activities, but also to raise the awareness about BRAVE. This will leverage our capability to reach and involve relevant stakeholders and further build on their expertise and knowhow.

Get on board and enjoy the reading!

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First consortium meeting in Slovenia on December 2017

On 19th and 20th December, BRAVE partners gathered in Slovenia. This first consortium meeting was hosted by the Automotive Association of Slovenia (AMZS), six months after launching the project.

The first day in Ljubljana was a great opportunity to review the work done by each partner, to discuss the first outcomes and to plan the activities for the months to come. Presentations especially focus on the literature review on the acceptance and road safety, ethical, legal, social and economic implications of automated vehicles (carried out by IfeS and VTI), and discussions were mainly focused on the definition of use cases. Indeed, specific scenarios had to be prepared for incoming testing of ADAS (Advanced Driver Assistance Systems) by road users.

Thus, the second day was fully dedicated to the preparation of the test-track studies with end-users, in AMZS test facilities of Vransko. The

purpose of the test-tracks studies is to learn more about user's requirements and behaviour regarding market and close to market ADAS systems. BRAVE focuses on user's requirements, and therefore the test-track study in Slovenia and all other tests will encompass drivers as well as other road users, Vulnerable Road Users (VRUs) and various stakeholders. For all tests, participants will answer a survey before and after realizing the use cases.



AMZS facilities in Vransko, Slovenia



Feedback on automated driving testing in Slovenia

In early March 2018, AMZS Safe driving Centre Vransko was in the sign of the most advanced technologies, testing Advanced Driver Assistance Systems (ADAS) and automated driving. Two use cases had been defined, both easily replicable by professional drivers. Participants responses were the first forming stones added into BRAVE user-centric approach. We used two Volkswagen Arteon, equipped with a rich selection of safety equipment, including adaptive cruise control (system for self-maintaining safety distance). With this safety equipment, Arteon can follow a car in front, brake by itself in front of an obstacle and also accelerate by itself to reach the pre-set speed if the road in front is clear. From a technical point of view, such functionalities can only be achieved with the help of radar. Arteon has its radar placed under the glass cover of the VW sign placed in the centre of the front grill.



Testing the adaptive cruise control with end-users in Vransko

In three days of testing, we performed two tests based on real situations from European roads with each participant. We designed the first test in the way that one of the two cars, with adaptive cruise control set, follows the other car in front at the speed 80 km/h first on a straight road and then over a crest, as this sort of road configuration and topography can be found often on European roads. Due to ascent followed by driving over the crest, the second car lost the virtual connection with the car in front and accelerated on itself. Right after driving over the crest the first car started to brake and the second car needed to adapt its speed and brake by itself. The participants in this test scenario sat on the co-driver seat beside our test driver and were not

acquainted with the scenario. Many of them were surprised and even shocked particularly when they were told by the driver that the car is driving on itself, with no action of the driver.

The second test also reflected a common scenario on European roads: again, one car follows a car in front with adaptive cruise control system set, with a distinction that now a third car unexpectedly and aggressively enters on the lane between both cars and starts to slow down. This sort of 'extortion' is common on our highways and represents quite a challenge for assistance systems, as the car sensors need to detect the obstacle very fast and autonomously provide a response with the braking system.

The tests were successful nearly each time, as the car managed to stop on its own and prevented a possible collision with the back of the first car driving in front. Only in 2 cases the professional test driver had to take control because the system did not respond properly.



Exploring the interplay of automated vehicle functions and vulnerable road users

The main objective in BRAVE is to improve safety and market adoption of automated vehicles by considering the needs and requirements of not only the future drivers but of all actors involved in the traffic environment. These could be other vehicle drivers and especially so-called Vulnerable Road Users (VRUs), such as cyclists or pedestrians.

In order to adequately match future automated systems to the needs and requirements of VRUs, several studies are planned in BRAVE. As a first step trust, acceptance, and the behavior of VRUs towards state of the art automated systems need to be explored as a baseline measurement. Therefore, a controlled study at the Fraunhofer site in Stuttgart, Germany was conducted. A representative sample of pedestrians was given the opportunity to experience available market systems both on road and in a virtual environment. The virtual environment was utilized to explore critical scenarios like automated emergency braking, which could be experienced as potentially dangerous. In a real-life scenario, an automated parking function could be experienced.

Within this study needs and potentials for improvement were derived so that future systems can be designed to perfectly serve the VRUs demands without compromising any safety aspect. The results of this study will help to derive innovative interactions and monitoring concepts for safe and intuitive vehicle-environment interactions. Thus, BRAVE enables a user-centric approach by considering feedback through testing existing technology and close-to-market concepts at early stages of the development process.

GRAIL - An Intelligent Interface between vehicles and Vulnerable Road Users

Like the Holy Grail in the medieval times, the GRAIL system provides a long-sought solution for deploying an intelligent and efficient interaction between vehicles and Vulnerable Road Users (VRUs), namely pedestrians and cyclists. GRAIL stands for GR^Een Assistant Interfacing Light, aiming at increasing road safety and reassuring VRUs when crossing the street, which is one of the main objectives of the BRAVE EU-funded project. Let's consider a situation where a couple of pedestrians are standing at the curb on a pedestrian crossing while looking for eye contact with the driver of the oncoming car. The pedestrians will definitely not start crossing



GRAIL system in detail



until they observe some signal indicating that the car is giving way to them.

In order to increase VRUs reassurance, the automated system developed by the University of Alcalá (UAH) performs two actions in parallel that contribute to improving the interaction between the car and the VRUs. On the one hand, the vehicle starts to decrease its speed significantly as soon as those pedestrians are detected by the onboard camera system. On the other hand, the GRAIL system, an array of green diodes located in the front of the vehicle, is turned on.

The combination of both actions, vehicle deceleration and green light coming on, provides a distinct sign to VRUs, indicating that the situation is safe for them to start crossing the street. The operation of the GRAIL system is graphically illustrated in the video available at <https://youtu.be/pfDrxVbVcto>.

New partnership with IMPACT Connected Car project

BRAVE has recently signed a new partnership agreement with another EU-funded project: IMPACT Connected Car. The objective of this partnership is to leverage dissemination activities, and take advantage of the communication channels of both project to reach a larger audience.

IMPACT Connected Car aims at providing support to SMEs of the connected car industry. The project especially offers Business, Financial and Technical coaching to beneficiaries, through a wide network of experts. SMEs will also benefit from a funding of up to 60k€ and have an easier access to large corporates to develop partnerships.

In the incoming months, BRAVE will seek to further develop its partnerships with relevant European initiatives working on similar topics.

KEY FIGURES

Consortium: 11 partners from 7 countries (Spain, France, Germany, Slovenia, Sweden, U.S.A, Australia)

Project duration: 36 months

7 work packages

24 experts involved in the Advisory Board

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