ADAS&ME

May 2018

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 688900

EDITORIAL

The road to full automation crosses two uncharted territories: the conditional (SAE 3) and the highly automated (SAE 4) levels of automation. In both cases, road users and vehicles need to co-exist and collaborate in both trivial and critical driving tasks. As long as automation is seen as a comfort element in "soft" traffic scenarios (such as parking or traffic jam assistance), user acceptance remains high. However, its spread to the "full" driving task often meets with scepticism and mistrust by a large percentage of road users, especially drivers. The issue may be resolved through the introduction of "adaptive driver assistance", where automation would be seen on the one hand as the "saviour" of a fatigued, overloaded, stressed or simply inattentive driver; and on the other hand as a driving "companion" providing advanced comfort functions but still keeping the driver in the loop.

The ADAS&ME project is developing complex systems that will acquire and fuse data from heterogeneous sources (driver state and emotions, vehicle generated data, and data from the environment surrounding the vehicle, i.e. other vehicles and road users) and implement customized HMI towards smooth handover of the driving control task between autonomous system and conventional human-driven (manual) mode. ADAS&ME is structured around concrete Use Cases that will be implemented in demo vehicles and/or simulators with the ultimate goal to build the necessary level of trust in drivers in increasing levels of automation.

In order to realise this step change, however, ADAS&ME is facing some major challenges… Well, Rome wasn't built in a day, they say, and many different roads might lead to Rome, be Rome the "perfect" system that combines manual and automated driving in a natural manner, thus increasing safety, comfort and acceptance of ADAS systems ("A" for "adaptive").

Josep Laborda (ACASA)

International Events

ADAS&ME participated in important international events worldwide with lots of interest from the audience:

AAAS Meetings took place in Austin (Texas) on February 15. Anna Anund, the ADAS&ME project coordinator presented the overall project including descriptions of use cases. The dissemination of the project led to a significant impact in social media but also an appearance in the digital edition of the popular The Guardian. The journalist Nicola Davis published an interview with Anna Anund about driverless cars. ADAS&ME project coordinator has explained the objectives of the most of the Use Cases, including interesting statements regarding Use Case A: "If we are talking about truck drivers, their main problem is they have been driving on the motorway too long doing nothing" or Use Case E&F: "In a motorbike we can have sensors in protective gear – gloves, jacket, helmet".
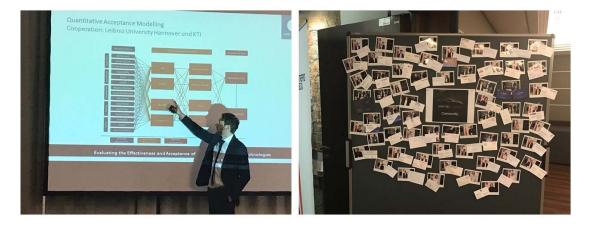

In addition, in April took place the Transport Research Arena in Vienna woth the ADAS&ME presentation at the INEA stand. Angelos Bekiaris (CERTH) and Marcel Mathissen (Ford) expained the objectives of the project and the achievements at the mid-term stage. In addition, Sri Venkata Naga Phanindra Akula (TUC) presented a poster with the title "A flexible automotive systems architecture for next generations ADAS". During the event, project leaflet was distributed among relevant audiece and stakeholders.

Intuitive vehicles

The Business-2-Business conference "Intuitive Vehicles" (www.intuitive-vehicles.com) took place in Berlin, Germany, from 18.-19. April 2018.

In 19 presentations and 2 interactive sessions, the conference was all about Human Factors, Human-Machine-Interfaces and User Experience (UX) in the automotive environment. Participants were exclusively senior representatives from OEM and TIERs as well as from Academia. Philosophical/background presentations, hands-on experiences, and research results were all presented. As was to be expected, a focus was on all levels of autonomous driving, and on augmented reality in the car. Some main findings were that empathy, emotion and experience are essential for UX, to be intuitive you have to build a relationship and to de-silo your activities, be holistic, reduce HMIs, reduce complexity, use natural interaction modi (voice etc.) and augmented reality. Key challenges in vehicle HMI are system transparency, fault tolerance,

proactivity, first contact, location, personality, learning, and personal profiles. Autonomous driving and the use of artificial intelligence will lead to a new driving behavior, car-driver interactions will be more natural, individual, and multi-modal, most important is trust and technological transparency.

For ADAS&ME, Andreas Wendemuth (U Magdeburg) presented the consortium activities. More venues like this are expected to come, the next one being the "Cognitive Vehicles" conference, June 12-13, 2018, in Berlin, Germany, where the focus will be on Imaging, Perception and AI.

Interview of Luca Zanovello from DUCATI
ADAS&ME Use Case E & F leader

What is your role in ADAS&ME project? I am the UC E&F leader, the ones dedicated to motorcycles

Which is the most innovative aspect in the use cases that you are developing? Well, it's hard to choose, many areas in the powered-two-wheelers field are still uncharted. For example there are few studies available on thermal comfort and muscular fatigue, and none considering the combination of them. Therefore all the activities related to the sensors positioning and integration, to the tests for data collection and to algorithm development are challenging. Also the new HMI (some components are embedded in the wearables) and the safety strategies, like the performance limitation and the motorcycle stabilisation are advanced. The synergy of the two aforementioned aspects, i.e. to have a motorcycle directly interacting with the rider based on his/her psychophysical conditions, is extremely fascinating.

ADAS&ME is at the middle point: which are the best aspects and the most

important difficulties in the project? I will start with the difficulties. There are considerable constraints on the motorcycle and the wearables in terms of room, weight, power supply, computational power, bandwith of the bike – wearables wireless channel, subsystem exposure to the environment,... This makes the development and integration of the hardware and software challenging. The other main difficulty is that there is little literature/research available on the UC E&F topics, this means few reference points and more time to solve the issues that appear during the project. Moving to the positive aspects I am satisfied of what we did in WP1 with stakeholders and end-users. I am then happy with the physical architecture we defined in WP2, with the big effort made to integrate the sensors in the wearables and to perform the first round of data collection tests. Finally I am very optimistic about the HMI and safety strategy: there is potential in them.

Are you involved in other R&D project funded by European Commission? Yes, the European Project PIONEERS (GA769504) which started a few days ago (1/5/2018). That project is specifically focusing on PTW riders' safety, mainly passive. Ducati role is to develop a system for motorcycle aimed at mitigating lateral impact effects on lower extremities.

6th Plenary meeting in Rome

8 February, Rome. The ADAS&ME consortium 6th Plenary meeting has taken place in Rome, from 5th to 8th February 2017, kindly hosted by <u>CTL</u> at <u>Sapienza University of Rome</u>. Almost all Work Packages (WPs) (except for WP6, which has not started yet) were presented and discussed giving a good feeling of great overall project progress and clear plan of future steps.
The first day was entirely dedicated to technical workshops of all <u>Use Cases</u>, data collection and PPS results.
The second day started with administrative and dissemination questions, where

multimedia communication actions were lively discussed. It continued with the presentation of the progress and next steps of all use cases, WP3 and WP2. Preparations for the Mid-term review started with preliminary plan and requirements presented by <u>CERTH</u>.

The third day in Rome began with the discussion points including Driver states, Driver monitoring and HMI sensors, Personalisation system and Repository Database storing and providing possibilities for the basic analysis for the data collected during ADAS&ME project.

It continued with presentations of WP5, WP7, WP8 and WP9.

Afternoon of the third day and the last day were dedicated to the UCs E and F HMI workshop.

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