ADAS&ME

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EDITORIAL

ADAS&ME has now been running for almost 18 months. We have had 5 Plenary meetings and additional workshops. The persons involved are now our new "working family". We share experiences, we argue and we find solutions. At the start of the project we focused on the Work Packages and all their "to-dos". The Use Cases were still not clearly defined and their role in relation to the work packages was still unclear. Today, I can see that things have changed. The Use Cases knit together the work packages in a way that makes it obvious for all of us what we are aiming to achieve.

The system architecture is defined, and the view of all sensors and those specifications are clear. Almost all driver states (sleepiness, stress, emotions, rest, attention) have their data ready, the environmental Situation Awareness Module is defined, and the reference database is developed. Also the work with the algorithms for the different driver states is ongoing. The HMI framework is set and the iterative HMI tests for each Use Case is about to start. In addition, the framework for the final evaluations is nearly complete. In parallel, information about the project is well disseminated and several scientific papers, conference papers and presentations have been made. Of course there are issues and difficulties, but the project would not have been challenging enough if there weren't. Our vision, to "**develop Advanced Driver Assistance Systems (ADAS) that incorporate driver/rider state, situational/ environmental context and adaptive interaction, to automatically transfer control between vehicle and driver/rider and thus ensure safer and more efficient road usage for all vehicle types (conventional and electric car, truck, bus, motorcycle)"**, is within reach, as long as we continue to work together. With that, I would like to take the opportunity to thank everyone involved in the project for all your hard work and keep continuing a close communication with our readers.

Anna Anund - Project Coordinator

IN THE SPOTLIGHT

5th ADAS&ME Plenary meeting took place in Barcelona *14-16 November, Barcelona*.

Local partner ACASA hosted an event that attracted all the ADAS&ME project partners with more than 45 people in total. On Tuesday 14th technical workshops were held on WP4, WP5 and WP7. WP2 presented the approach towards the final driver state algorithms and the plans for final implementation in vehicles; WP5 discussed on the test plan for HMI per use case and WP7 workshop worked on initial plans and data collection of the pre-pilots. On the following two days the consortium presented the overview of all work packages focusing on the submitted deliverables and the progress of all tasks in order to prepare the mid-term review of the project that will take place in May 2018. Next project meeting is expected to take place in February 2018 in Rome.

Bus drivers

Stress is a part of the daily work for bus drivers and a factor that also contribute to driver fatigue. One of the Use Cases in ADAS&ME focus on the idea to support the bus stop release him/her from the driving task for a short while. In addition, a system like this will theoretical provide a safer, smoother, more comformtable, and energy efficient stop and start at bus stop.

Such a support system requires knowledge about the level of stres and fatigue in drivers to make the transitions between the bus and the drivers safe and secure. A first explorative data collection on real road involving 15 bus drivers have been done with three purposes.

1. To gain knowledge about the levels of stress that a bus driver is normally subjected to.
2. To gather data that will be used for algorithm development to determine the stress level of the driver.
3. To compare physiological data obtained via unobstrusive sensors with the data from an ambulatory medical data acquisition system

STAGE 1 DATA COLLECTION

Stage 1 data collection took place at CERTH premises in Thessaloniki from the 4th to the 22nd December 2017. It was preceded by a long preparation and shakedown activity.
The tests are carried out using actual project sensors, integrated skilfully integrated in the undervest, in the back-protector, in the gloves and in the helmet by Dainese. Reference systems are used only to verify their performance.
The activity is performed using CERTH simulator, acquisition on real road with a Ducati Multistrada were limited and used to assure that external conditions like vibrations and rider movements, that cannot be accurately reproduced on a simulator, do not influence significantly the sensors measurements.
The rider states studied are physical fatigue (focusing on high temperature situations), visual distraction and, secondly, stress.
To study physical fatigue a thermal chamber had to be built: in there it is possible to control the air temperature and humidity using a traditional heating system and a humidifier, reproducing direct sun irradiation with a specific lamp and simulating relative wind effect with an industrial fan.
To induce visual distraction a simple but effective LED mounted on the steer was used, while for stress a specific virtual scenario was created.
This data collection has been fundamentally important for use cases E and F, since little researches on these topics were made in the past in the motorcycle field and no valuable data were available before.

DLR Pilot

It is envisioned that the driver monitoring system developed in ADAS&ME is able to detect emotional states of drivers based on audio, video and physiological data. In order to be able to discriminate between different emotional driver states using machine learning algorithms, a training data set including realistically experienced emotions is needed. Therefore, a pilot study in a real car will be run on a test track at the DLR facilities in Braunschweig with the goal to generate such a data base. For this, participants will drive a predefined route in the FASCarII, a test vehicle of the DLR, while they will be monitored using SmartEyePro-Cameras, a microphone, and physiological sensors. During the drives, participants have to accomplish certain secondary tasks that aim to induce the desired emotions in the driver. In total, the elicitation of four different target emotions in targeted. Frustration is induced using a badly designed speech-based interaction system, anxiety using a malfunctioning brake assistant braking at unforeseeable moments and a positive state via a funny radio show. Moreover, one neutral drive is accomplished. Additional speech data is generated by conversations following the respective drives. The final data base will be used by the partners EPFL, University of Magdeburg and Vedecom for the training of the machine learning algorithms.

Read more

More information about the project and use cases on our website

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