ADAS&ME

March 2019

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

EDITORIAL

Automation and ADAS are likely to have significant impact on our economy, society and everyday lifes.

Globally, automakers are focusing on autonomous vehicles to satisfy customer demand, to remain competitive and to improve their product portfolio. Development of a supportive regulatory framework, government funding and investment in digital infrastructure are also expected to play a key role in affecting market growth over the time.

In the meantime, the global autonomous driving market is expected to grow up to $173,15bn by 2030 with shared mobility services contributing to a large part of this increase.

In this frame, ADAS&ME not only develops new solutions but also studies the existing market in order to ensure its solutions will contribute to the best interest of the users. Therefore the consortium now looks forward to the coming socio-economic and market study to better understand the project environment and support the significant progresses of our solutions development.

ADAS&ME HMI strategies

The ADAS&ME HMI strategies are specified for all vehicles and the respective deliverable is ready for submission in a few days.

This is the result of extensive user tests and several iterations and improvements in simulators and vehicles. The HMI strategies integrate the automated functions and interventions, such as brake and steering support with the aim of guiding drivers and passengers to safe and smooth transitions.

Integration of HMI elements into Fraunhofer IAO driving simulator in Stuttgart, Germany

The HMI team has also performed an expert survey to address the consequences of multiple driver states. The adaptation strategies and personalization will be a major focus in the coming month. The HMI team is now also focusing on the finalization of integration into the vehicle demonstrators and hence working closely with the Use Case leaders. Plug fests are planned to integrate not only the final

HMI and test the software, but also to connect driver state sensor input via the decision support system with the HMI. Most of the HMI hardware is installed and tested. The HMI strategies are already working to a large extend and we are looking forward to our final demonstration planned for end of 2019 in Barcelona.



Integration of HMI into the Ducati test bike and Dainese Helmet in Bologna, Italy

New simulation tools have been applied with great results regarding immersion and flexibility. New Virtual-Reality Simulator for Scania Cockpits

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ADAS&ME Use Cases in H2020RTR Conference

Brussels

29 November 2018

The second edition of the H2020RTR conference, organised by ERTRAC took place in Brussels. The European-wide event dedicated to the presentation of results from road transport research in H2020 projects, gathered more than 75 projects. ADAS&ME participated in the "Driving assistance and automated driving systems" with other partner projects such as MAVEN, AUTOMATE and VI-DAS.

ADAS&ME contribution at the Automated Road Transport workshop

Hambourg

21 November 2018

ADAS&ME was represented in the Joint workshop of European Projects on Automated Road Transport by Frederik Dietrichs from Fraunhofer IAO. The event was organised by the project AUTOMATE with 5 sessions related to the current status of automation and expected challenges that EU funded projects are facing.

Interview : Thierry Bellet from IFSTTAR, Pre-pilots studies

What was the objective of Activity 7.2 you managed in ADAS&ME?

This activity was focused on the implementation of a set of Pre-Pilot Studies (PPS) to support the design and development of the future monitoring functions and, at last, the driving aid systems to be progressively developed in ADAS&ME.

Why were data collection pre-pilots necessary in the project?

Empirical data collection from Pre-Pilot Studies was crucial for WP4 efforts related to the development of monitoring functions able to assess, in real time, different drivers' states (in terms of fatigue, stress, inattention or emotions). Indeed, developing monitoring systems requires to use empirical datasets (for designing, training and then evaluating the algorithms), that should be made available to the developers. Because of the innovative objectives of ADAS&ME, such empirical material was not available at the beginning of the project. Consequently, it was necessary to collect that in accordance with the specific research topics and technical objectives of the project.

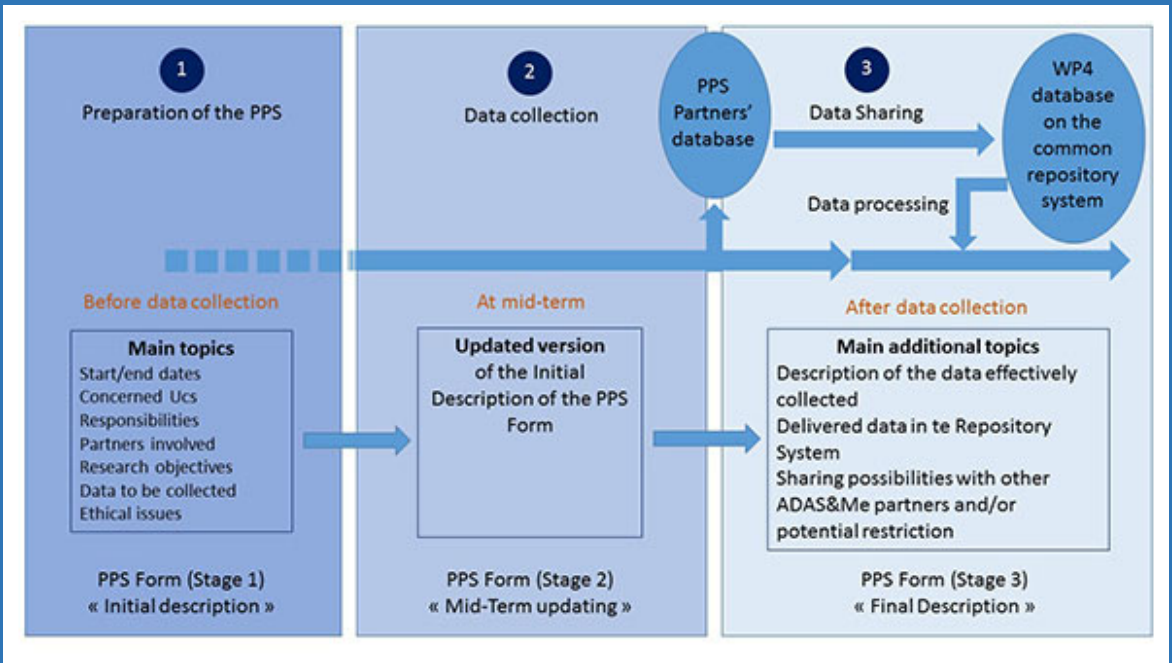
How was the work conducted ?

To manage this Activity 7.2, IFSTTAR proposed a common methodological framework to monitor the data collection process though the different PPS, to be progressively implemented by the ADAS&ME partners along the project (between T9 and T30). As summarized in the following figure, this management process included 3 main phases: "Before" (preparation of the study), "During" (data collection) and "After" the PPS (data sharing with WP4 and other ADAS&Me Partners). At each one of these phases, a specific "PPS form" describing the PPS and its progress status was produced.

As a first step, partners in charge to implement a PPS had to complete a synthetic "From" about the "initial description" of their PPS. From this initial description, it was possible to collectively assess the adequacy and the complementarity of the PPS implemented within the project, to harmonize the data collection process between partners, and finally to prepare the future sharing of the PPS data inside

the consortium. Then, during the data collection process (Phase 2) the initial description was updated in case of changes introduced in the experiment plan. At this 2nd stage, collected data were stored by the partner(s) in charge to practically implement the PPS. Finally, when the data collection was fully completed, the datasets were shared with WP4 partners from a repository system, specifically developed by UPATRAS for ADAS&ME. In addition, each leader of the PPS had to complete the "final description" of their PPS, to support the management of the data collection process in 7.2.

In addition, from T9 to T26, six workshops were also implemented during the ADAS&ME plenary meetings. According to the progress in the data collection process, these workshops were more related to methodological considerations, supervision of the data collection process, data sharing issues (including requirement towards the repository system to be developed in WP4) and then about the experience gained from each PPS and potential recommendations for additional PPS.



What are the main results and how PPS were be used by other partners in ADAS&ME?

During the project, 9 Pre-Pilots Studies were implemented in order to collect specific datasets related to the drivers' emotional states and physiology, according to the different Use Cases (UC) explored in ADAS&ME. Five PPS were performed during a 1st round (from T9 to T18), and four during a 2nd round (from T19 to T30). As far a possible, this data collection process per PPS was based on similar sensors (it was typically the case for Smart Eyes eye tracking system) to made the collected datasets sharable between the partners as a whole. These 9 PPS were the following:

Use Case A (2 PPS - Total of 45 truck drivers – involved partners: SCANIA)**:** The aim of these PPS, implemented on a truck simulator, was to collect data to assess the cost of a day of long haul driving on cognitive and driving task performance, and to investigate truck drivers' emotions, distraction and stress while driving. The collected data were used to develop monitoring functions about these different states of the truck drivers.

Use Case B (2 PPS – Total of 26 electric car drivers – involved partners: VALEO, VEDECOM, OVGU & IFSTTAR): The aim of these PPS, implemented on open roads, was to collect empirical data to investigate driver's emotions and evaluate electric car drivers' range anxiety. To induce emotions and range anxiety among the drivers, a Wizard-of-Oz method was used. The collected data were shared

Use Cases C&D (3 PPS - Total of 64 car drivers - involved partners: DLR, OVGU & FORD): These PPS, implemented on test ground or on open road, aimed to collect data to monitor car drivers' stress and distraction (1 PPS) or their emotional states (2 PPS). Regarding emotion, a Wizard-of-Oz method to induce them was designed, in order to collect as natural as possible emotional status from audio, video and physiological data. Like for UCB, the collected data were shared with WP4 partners to develop algorithms for automatic emotion recognition based on facial expressions and speech.

Use Cases E&F (1 PPS - Total of 12 riders - involved partners: DUCATI and CETRH): The aim of this PPS, both implemented on open road and on a driving simulator, was to collect data to evaluate the riders' physical fatigue, inattention and stress. More precisely, the aim was to identify methods for inducing the states of physical fatigue, inattention and stress and to gather data to be used for algorithm development to determine the level of each state of the rider.

Use Case G (2 PPS - Total of 25 bus drivers - involved partner: VTI): The aim of this PPS, implemented on a driving simulator, was to collect data to evaluate the bus drivers' stress, inattention and fatigue. This data collection also allowed the partners to gain knowledge about the levels of stress that a bus driver is normally subjected. In addition, this PPS provided a set of data that are required for WP4 algorithm development for monitoring the stress level of the driver.

As a whole, empirical datasets were collected among a total of 172 participants from the 9 pre-pilots studies implemented in Activity 7.2. Except for Video data (which were processed from another way, due to their specific technical and ethical issues regarding anonymization), all the empirical data collected from these PPS were made available on the ADAS&ME common Repository System, and then shared with all the project partners in charge to develop monitoring algorithms aiming to assess drivers' Fatigue, Stress, Inattention and Emotions.

8th Plenary meeting in Bologna

The Plenary meeting was hosted on 24 to 26 October 2018 by DUCATI in Bologna.

As usual the Plenary was full of contents like updates from WP3 about Environmental Sensing, WP8 and the end-user survey that is being developed.

The use case demonstration also showed the good work carried out by this important part of the project.

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More information about the project and use cases on our website

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