THE PASCAL PROJECT AND THE RELATED EUROPEAN PROJECTS

A poker of consortiums for a “driverless” Europe

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Under the Horizon 2020 programme, the PAsCAL project interfaces with other important projects to promote the development and acceptance of autonomous vehicles.

The PAsCAL project turned one year old. These were months of intense work, during which the foundations for the planned activities were laid, but not only. For example, the first interviews with sector experts and the first surveys have already been carried out, among groups of citizens in different European countries and with specific categories such as visually impaired and professional drivers - we will report on this in the next articles. And the work of defining the experimental scenarios with the different simulators and the respective interdependencies is well under way. Some high-level expert groups have been set up too, external to the project partners but interested and willing to follow the project’s work by providing their advice and their contribution of knowledge and skills. Among the various activities, relationships have also been established with other projects dealing with the same subject. The call of the EU funding program Horizon2020 which finances PAsCAL, in fact, provided for the financing of multiple projects, in order to have different approaches and points of view on the subject but also to be able to finally evaluate both the consistency of certain results and the differences in results obtainable from different approaches. We therefore asked each of the other 3 projects to "introduce themselves" allowing a first view of their different perspectives and settings.

PAsCAL
Enhance driver behaviour & Public Acceptance of Connected & Autonomous vehicles

The project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement n. 815098

Trustonomy

(Horizon 2020 / grant agreement n. 815003): Building acceptance and trust in autonomous mobility

Kicked off in May 2019, within the Horizon 2020 Research and Innovation programme from the European Commission, Trustonomy (a neologism from the combination of trust + autonomy) wants to raise the safety, trust and acceptance of automated vehicles by helping to address technical and non-technical challenges through an integrated and inter-disciplinary approach, bringing experts and ordinary citizens to work closely together. Trustonomy will investigate, setup, test and comparatively assess, in terms of performance, ethics and acceptability, different relevant technologies and approaches in a variety of autonomous driving scenarios, covering different types of users, road transport modes, levels of automation, driving conditions.

Despite technological breakthroughs in connected and automated transport, the total transformation of existing transportation into a fully autonomous system is still decades away. In the meantime, mixed traffic environments with semi-autonomous vehicles, passing the control to the human driver in specific situations, is expected to become the norm. In this context, the human factor is still (and will remain) essential for the safety and performance of road transport in the forthcoming decades, due to the necessary driver-vehicle interaction, and because of the co-existence of mixed systems, which is likely to be raising unexpected challenges.

To find the right level of cooperation level between human/machine is not that easy neither fast. Working on people's trust is a huge challenge. And even if you overcome this challenge, a coexistence phase human/machine may still be necessary. The multidisciplinary assessment frameworks proposed by the Trustonomy project are meant to bring the human factor at the very center of different technological approaches.

Within its first year of work, involving 16 partners and supported by a high-level Advisory Board, Trustonomy has analysed the overall operational context of automated driving, including regulatory frameworks, operational barriers, existing solutions and expected trends, both at technological and market levels, setting up the stage of the project.

Trustonomy also carried out preliminary research to define the user requirements, focusing on the scenario known as "Request to Intervene", whereby a driver is required to take manual control back of a previously automated vehicle. A survey was undertaken to explore what characteristics/design considerations are important to users, with respect to the amount of trust they would have in this type of scenario.

After that, methodological guidelines and the modular architecture were defined, while at the moment, Trustonomy is especially focused on the design of its specifications, a key work involving almost the whole consortium. Project pilots, mainly devoted to the analysis of user's acceptance of and trust in autonomous driving systems, are taking shape as well, and preliminary trials will start in the coming months, compatibly with the Covid-19 emergency.

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Drive2theFuture

(Horizon 2020 / grant ag. n. 815001): Needs, wants and behaviour of 'Drivers' and automated vehicle users today and into the future

Drive2theFuture (Horizon2020/Contr.No. 815001) kicked off in May 2019 a 3-year trip towards preparing the drivers, travelers and vehicle operators to accept and use connected, cooperative and automated transport modes and the industry of these technologies to comprehend and meet their needs and desires. Drive2theFuture develops training, HMI concepts, incentives policies and other cost efficient measures to promote and then to comparatively assess several alternative connected, shared and automated transport Use Cases for all transport modes and with all types of users (drivers, travellers, pilots, VRUs, fleet operators and other key stakeholders), in order to understand, simulate, regulate and optimize their sustainable market introduction; including societal awareness creation, acceptance enhancement and training on use.
With 31 partners from 13 European countries on board and an International Advisory Board consisting of exceptional experts in the area, Drive2theFuture (coordinated by CERTH/HIT) has now completed its first year of work, having quite interesting and important first results to present.
Primary focus has been on the user clustering, needs' and desires' identification and defining the relevant use cases. Detailed user clustering has been performed, including all modes, along with a terminological database comprising 120 terms and introducing a new AV-related related VRUs definition. An extensive User acceptance survey addressing all transport modes and automation levels, is being undertaken in more than 20 countries, translated in 18 languages and receiving – so far – more than 10.000 responses (preliminary analysis already performed). Measures' transferability across modes has been investigated, while risks concerning the acceptance of AVs have been identified and assessed by experts, clustered in four categories, i.e. organizational, legal, technical and behavioural, also taking into account social media sentiment analysis. A taxonomy of mode-specific knowledge and skills required for operating AVs has been performed, research hypotheses have been defined, along with a set of 13 Use Cases which will frame the evaluation and impact assessment within Drive2theFuture. Moreover, significant progress on big data analytics, simulation and behavioural modelling has been achieved, along with the benchmarking of good practices on existing HMI and the identification of each user group's training needs for each mode.
In terms of evaluation and assessment, the impact assessment framework and related KPI's are defined, while Drive2theFuture Phase I (setting the scene) pilots are already ongoing.
Drive2theFuture next steps include, among others, the implementation of Phase II (evaluation) pilots– considering COVID-19 restrictions – the development of training tools and curricula, as well as affective and persuasive HMI concepts and the AV driver Behavioural Model and simulation tools.
Ethical, sociocultural, legal and safety/security issues are carefully being considered throughout the project, while correlation to MaaS is another important issue which is investigated. Business models, guidelines and policy recommendations are also an area of special focus, towards issuing, based on the overall results of the project, an Automation User Acceptance creation path Roadmap, for the years to come.

For further information: www.drive2thefuture.eu
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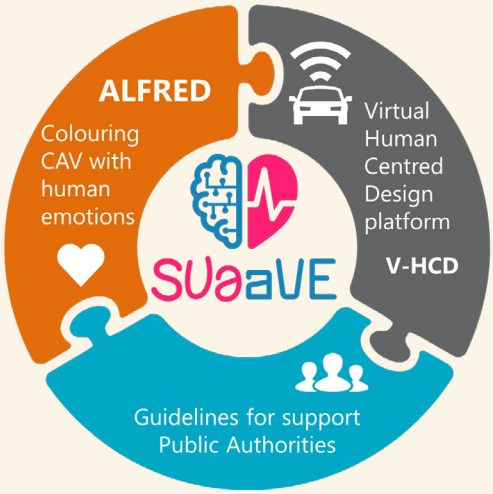
SUaaVE

(Horizon 2020 / grant agreement n. 814999): The new approach for coloring automated driving with human emotions



While the deployment of connected automated vehicle (CAV) turns into reality, its acceptance has been called into question. Societal issues regarding public acceptance, user awareness and ethics, therefore, become priority concerns. The approach based on the technology push, jeopardizes social viability of innovative technology like CAV, as it creates a gap between the well-thought technical reliability and public acceptance.

The SUaaVE project (SUpporting acceptance of automated VEhicle), funded from the European Union's Horizon 2020 Research and Innovation Programme, aims to make a change in the current situation of public acceptance of CAV by leaning on a Human-Driven Design (HDD), enhancing synergies social science, human factors research and automotive market by means of an iterative process of assessment, co-design and prototyping. The process involves above 4,000 subjects (passengers, traditional and future drivers, VRUs) as well as 100 experts and stakeholders along the project.

The main goal in SUaaVE is the new paradigm of automation: ALFRED, defined as a human centered artificial intelligence to humanize the vehicle actions by understanding the emotions of the passengers of the CAV and managing corrective actions in vehicle for enhancing trip experience. Furthermore, SUaaVE tackles social issues regarding public acceptance, ethics, and user awareness. In this regard, the goal is the development of Guidelines for support Public Authorities, representing a breakthrough in the public acceptance of future CAVs for both the society and, in particular, for all road users.

The research in SUaaVE are underpinned by different methodologies such as focus group discussions, Delphi study, large-scale survey (France, Germany, UK, Italy, Spain and The Netherlands) as well as experimental tests with subjects to assess user behaviour and acceptance levels in the framework of automated vehicle. These tests are supported by the Virtual Human Centred Design (V-HCD) platform, a 3D virtual simulation environment for urban and highway road context, that allows "immersive experiences", as a passenger or as an external agent, assessing their acceptance of CAVs.

SUaaVE, is coordinated by the Institute of Biomechanics of Valencia (IBV) and composed by a highly experienced and multidisciplinary consortium. The partners' profile represent a twofold vision of the problem: Academic and Scientific Perspective (RUG, TÜM, VED, Bordeaux INP, IFSTTAR and IBV) and Industrial vision, including different companies in the value chain: OEM - CRF (a company of FCA)-, TIER 1 – FICOSA/AAA - and technological suppliers, CVT and IDIADA.

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