

**Press release**

## **SystemX launches the Vehicle Robots and Autonomous Shuttles Scenarios (SVR) project to assess the operating safety of autonomous shuttles and robot-taxis**

*With the SVR project, SystemX uses its expertise in design, simulation and validation of autonomous systems, for use cases related to the operational safety of autonomous shuttles and robots-taxi. This approach that was implemented as part of the SVA project (Simulation of Autonomous Vehicle Safety) was launched by the IRT in 2015, for passenger cars with the aim of constructing scenarios for validation purposes, and will be extended to shared transport (shuttles and robot-taxis). This project will lead to the definition of a common language and a library of test scenarios for the entire industry and the realisation of a PoC (Proof of Concept) to demonstrate its feasibility via a simulation platform.*

**Palaiseau, le 11 avril 2019** – SystemX, the only Institute for Technological Research (IRT) dedicated to the digital transformation of industry, services and territories, launches the SVR project (Vehicle robots and autonomous shuttles Scenarios) lasting two years. Its goal is to build a shared repository at the national level by the autonomous shuttle and robot-taxi industry, in order to allow the evaluation of the dependability of their systems by the use of digital simulation. Research carried out within SystemX will lead to the definition of a common scenario description language for the entire sector as well as to the construction of a database of potentially secure scenarios (infrastructures, driving situations, external disturbances etc). These scenarios will be used to perform digital and physical tests for the purpose of designing and validating autonomous transport systems. This common reference system will be used to progressively establish the protocols for the approval and authorisation of autonomous transport systems with the authorities.

The SVR project is part of the SystemX's autonomous transportation activities, aimed at providing methods and tools for the design and validation of these systems. The autonomous transport system, as defined in the SVR project, integrates several elements such as vehicles (shuttles and robot-taxis), road infrastructure, signalling, a centralised control post and communication between these elements. The entire set-up is secure: each element involved in this security must remain operational in all circumstances (time of day, traffic, weather etc) during which the service must be provided. The scenarios and the simulation implemented must therefore cover all of these elements in all the selected conditions of use (rain, fog, night etc). This project will help consolidate the institute's expertise in the design and validation of autonomous transport systems, particularly by bringing together the automotive and shuttle sectors.

SystemX targets 5 main objectives through this project:

- To define a data model to describe the operating situations of autonomous shuttle and robot-taxi systems.
- To define a common vocabulary, to be shared by all the relevant parties in the public transport sector, to describe the use cases and associated test scenarios.
- To build a base of test scenarios for stand-alone shuttle and robot-taxi systems. These scenarios may come from situations created in the design phase of the system, feedback from experiences, or extracts from existing or in-process databases (incident databases of the experiments).

### **The SVR project in a nutshell**

- **Application sector:** Mobility and Autonomous transport
- **Duration:** 24 months
- **Total effort:** 7 ETP

**Industrial partners:** AVSimulation, EasyMile, Groupe PSA, Navya, RATP, Renault, SNCF, Transdev, Valeo

#### **Main objectives of the project:**

- Definition of a common language and a library of test scenarios to evaluate and validate the dependability of autonomous shuttles and robot-taxis.
- Realization of a PoC on a simulation platform.
- Recommendations for evaluating the achievement of safety objectives.

- To define an approach based on the list of cases covered by the simulation (and according to success criteria) in order to identify a Safe Use Perimeter (ODD).
- And lastly, to demonstrate the feasibility by producing a Proof of Concept (POC) on a simulation platform, including sensor models and a self-contained shuttle model and functions with signaling or the control station.

These objectives are intended to generalize the proposed approaches for the private vehicle in the SVA project, including in particular the construction of a scenario library and the carrying out of digital tests, to shared transport systems in which the vehicle is just one constituent system.

It should be noted that these collaborative research efforts are part of the **Roadmap of the France Autonomous Vehicle Program of the New Industrial France (NFI) programme**. The results of these projects will feed back into the common good to participate in the demonstration of the safety of the systems within the framework of approvals and authorisations of operation etc.

*“Unlike the autonomous car of a level 3-4 which can be confronted with an infinity of situations but which can ask the driver to resume driving in the event of system failure or difficulties in interpreting its environment, autonomous shared transport of the shuttle-type and level-5 robot-taxis must ensure that the driving, availability and safety of the vehicles are not compromised in any circumstances. On the other hand, the autonomous shared transport environment is better controlled than that of the autonomous car, so it can be more easily adapted to meet safety requirements. Securing is therefore not just about the vehicle but also about infrastructure and centralised control”,* explains Jean van Frank, SVR Project Manager at SystemX.

### **About IRT SystemX**

Founded in 2012 under the “Investing for the Future” (PIA) program, the Institute for Technological Research (IRT) SystemX positions itself as an accelerator for the digital transformation of industry, services and territories. As part of its 2019-2025 roadmap, the institute has set for itself three main objectives: to accelerate the use of technologies for value creation, to strengthen the collaborative R&D capabilities of companies, as well as to stimulate the production of knowledge of the academic ecosystem surrounding major scientific challenges. Its research works cover the issues of four priority application sectors: Mobility and Autonomous Transport, Industry of the Future, Defense and Security, Environment and Sustainable Development. It spans height different scientific and technical fields: Data Science and AI; Human-machine interaction; Scientific calculation; Optimization; System Engineering and Safety; Dependability of critical systems; Digital security and blockchain; IoT and future networks. The use cases and projects carried out by SystemX are at the crossroads of these application sectors and scientific and technical domains, while relying on one or more technological platforms developed within the institute. Based on the Paris-Saclay area, Lyon and Singapore, SystemX has since its creation in 2012 launched 36 research projects (including 24 ongoing ones), involving one hundred economic partners and 32 academic laboratories, and has now as many as 350 employees including 140 own resources.

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