



Press release

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ESI Group and the DesCartes program aiming at transforming Singapore into a hybrid, ethical and sustainable smart nation

ESI Group, Rungis, France, (ISIN Code: FR0004110310, Mnemo: ESI), a global player in virtual prototyping for industries, is collaborating in the launch of the DesCartes project in Singapore by providing its scientists, its expertise in hybridization methods and its virtual prototyping software solutions to the various stakeholders.

DesCartes a 5-year and a 35 million euros budget collaborative program, has been selected by the National Research Foundation (NRF) of Singapore and is based on the CREATE campus, "Campus for research excellence and technological enterprise", the international research hub of Singapore. Behind this very French name lies one of the largest collaborative programs of the CNRS: the "Program on Intelligent Modelling for Decision-making in Critical Urban Systems", dedicated to Hybrid Artificial Intelligence.

A smart city project to a better extent: A smart nation project

For many years, many smart cities projects have been launched. The principle of these smart cities is to collect data generated by sensors, to deploy specific applications, such as sensors indicating air pollution, alerts on accidents, traffic conditions in real time... However, the concept of smart nation carried by Singapore differs from the others because it pushes the concept to its paroxysm: from the digitization of an entity, a building, a single system to the digitization of a whole city interacting in real time.

From electrical grid optimization to delivery drones

DesCartes is developing hybrid AI methods, combining AI with knowledge-based models (physics, engineering), to enable trusted, real-time decision-making that is "people-centric" and "in harmony with society." All in response to complex situations related to critical urban systems in the context of Singapore's "Smart Nation." This research will be applied, for example, to urban mobility or energy management, or to anticipate the needs of future transportation networks, smart industries, or smart buildings. *"For example, we aim to develop solutions to optimize the supply and demand of the electricity network, or solutions to improve the flow of cab drones or delivery drones, or to develop intelligent predictive maintenance applied to industrial tools,"* explains Dominique Baillargeat, director of CNRS@CREATE. Systems in the city that will be able to analyze data on the use of services by the population and then make optimization decisions.

ESI's role in this project.

ESI, recognized worldwide for its predictive physics modeling and virtual prototyping expertise, will play several roles in this program. First, its Scientific Director, also a member of CNRS and ENSAM, Prof. Francisco Chinesta, will be the program director. In addition, the Group will make its performance simulation solutions ([VPS](#), [VA One](#), [Simulation X](#), etc.) and its expertise in hybridization and model reduction methods available to the partners and the program. ESI will thus be able to predict material



behavior in real time, anticipate incidents (associated with damage, cracks, corrosion, etc.), model the wind for better use of drones, and make city management more intelligent and human-friendly. Finally, ESI will bring all its engineering expertise to optimize the platform in which the data will be used to make the right decision at the right time.

Dr. Francisco Chinesta, leader of the engineering activity for ESI in this project, says: *"The goal of the Singapore program is to think and design an interconnected smart city with features that will revolutionize the concept of smart cities. In this project, it is essential to place the citizen - the human, but also more generally the living - at the heart of the hybridization devices. All the partners in this project aim to make Singapore an ethical, responsible and secure new city."*

The Descartes program partners

The Descartes project involves on the French side:

- CNRS
- 13 universities and prestigious schools : Université Paris-Saclay, Université Toulouse Paul Sabatier, Université Lyon III Jean Moulin, Université de Bordeaux, École Nationale de l'Aviation Civile, Université Paris Sciences & Lettres, Université de Strasbourg, Arts et Métiers, INP Grenoble, INP ENSEEIHT, Ecole Normale Supérieure de Paris-Saclay, Université Grenoble-Alpes, Université Côte-d'Azur.

and, on the Singaporean side:

- 3 universities: Nanyang Technology University, National University of Singapore, Singapore University of Technology and Design.
- A*STAR: Agency for Science, Technology and Research. A*STAR is the national R&D agency of Singapore.

It is developed in collaboration with five industrial partners: ARIA, CETIM MATCOR, EDF, ESI Group and Thales.

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About ESI Group

Founded in 1973, ESI Group is a leading innovator in Virtual Prototyping solutions and a global enabler of industrial transformation. Thanks to the company's unique know-how in the physics of materials, it has developed and refined, over the last 45 years, advanced simulation capabilities. Having identified gaps in the traditional approach to Product Lifecycle Management (PLM), ESI has introduced a holistic methodology centered on industrial productivity and product performance throughout its entire lifecycle, i.e. Product Performance Lifecycle™, from engineering to manufacturing and in operation. Present in more than 20 countries, and in major industrial sectors, ESI employs 1200 high level specialists around the world and reported 2020 sales of €132.6 million. ESI is headquartered in France and is listed on compartment B of Euronext Paris.

For further information, go to www.esi-group.com.

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