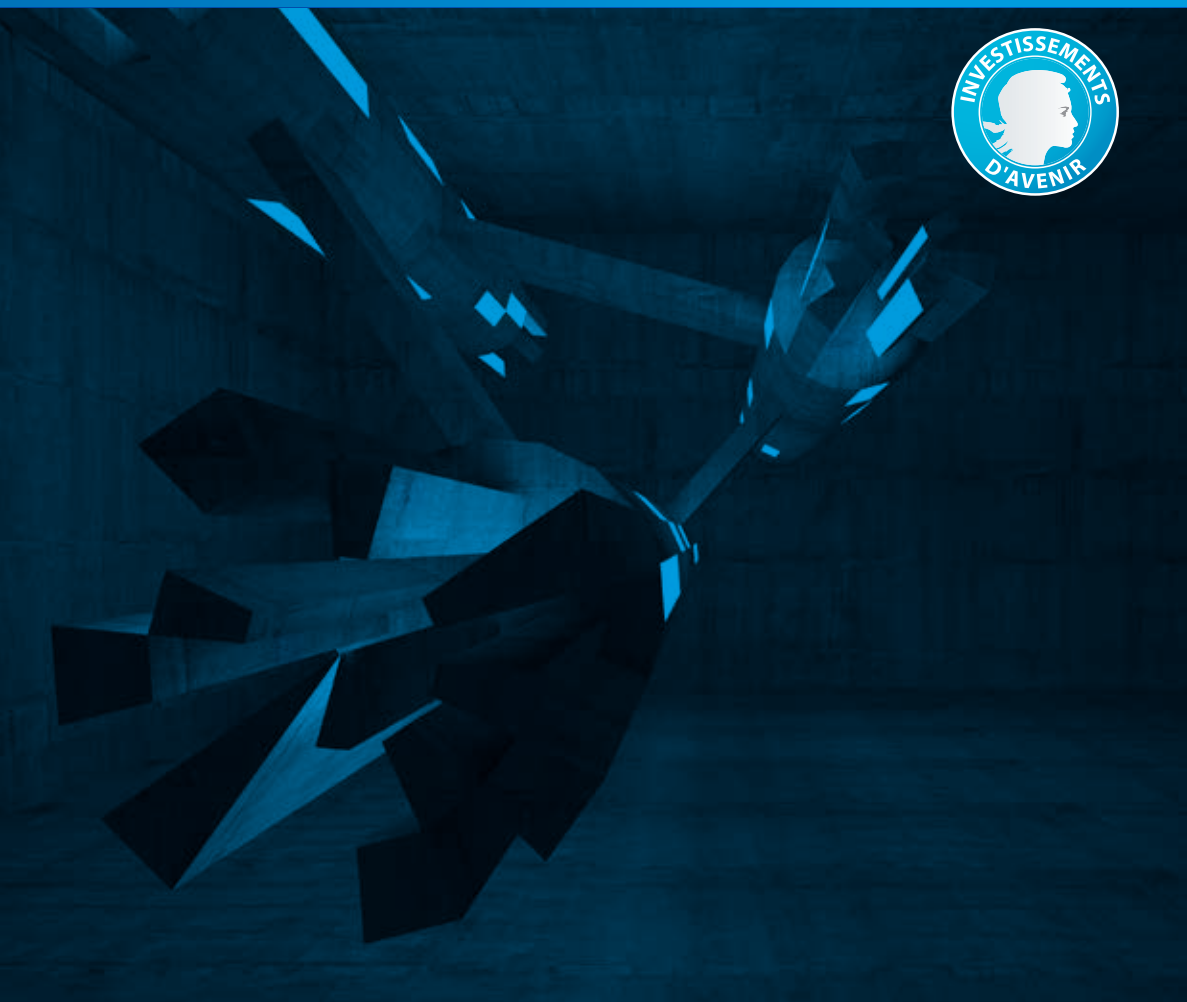




# Boosting Digital Transformation



# Institute of Research and Technology (IRT) SystemX

SystemX, set up in 2012, is the only Institute of Research and Technology (IRT) in the field of **digital engineering of complex systems**, meeting industries and territories' technological and scientific challenges through flexible, open and collective applied research. The functioning of SystemX is based on two fundamental aspects:

● **Bringing talents together.**

The institute brings together all the partners involved in its projects under one roof, thus creating a melting pot of interaction between stakeholders in the public and industrial research sectors.

● **Pooling of skills and platforms.**

SystemX is consolidating its technological platforms by pooling the components and infrastructures of its research projects, and is developing expertise in the service of its public and private partners.



As part of the French government's investment for the future Program (PIA\*), the IRTs are interdisciplinary institutes for technological research bringing together stakeholders from higher education and research establishments, startups, SMEs and large corporations engaged in joint research programs.

## Locations in France and internationally

SystemX aspires to become a recognized player in the field of digital engineering of complex systems on the national and international stage. To nourish this ambition, the institute has forged partnerships with globally renowned research centers and is broadening its scope of action in France and internationally.



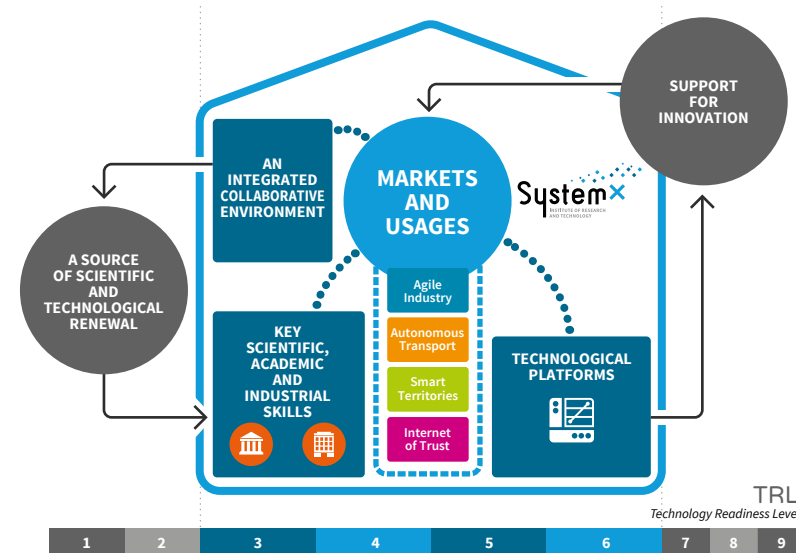
\* Programme d'investissements d'avenir

# Boosting Digital Transformation

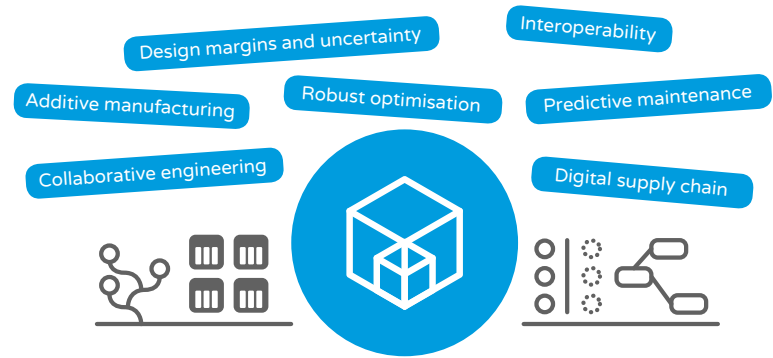
SystemX has three defined objectives:

- 1 Meet industrial challenges** by fostering competitiveness and anticipating technological disruptions in the phases of design, modeling, simulation and testing innovations that increasingly incorporate digital technologies.
- 2 Share and disseminate the knowledge and skills acquired** through consolidated technological platforms as part of the institute's research projects and training initiatives.
- 3 Promote excellence and spread the institute's influence** in Europe and internationally with a view to making it the French applied research reference in digital engineering of complex systems.

## An integrated collaborative environment

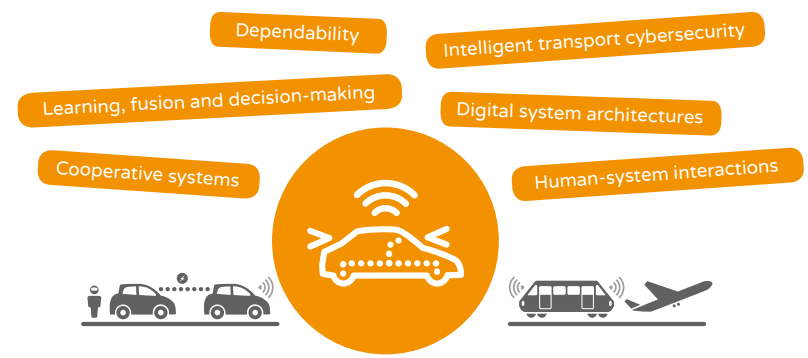


# Meeting Industrial Challenges



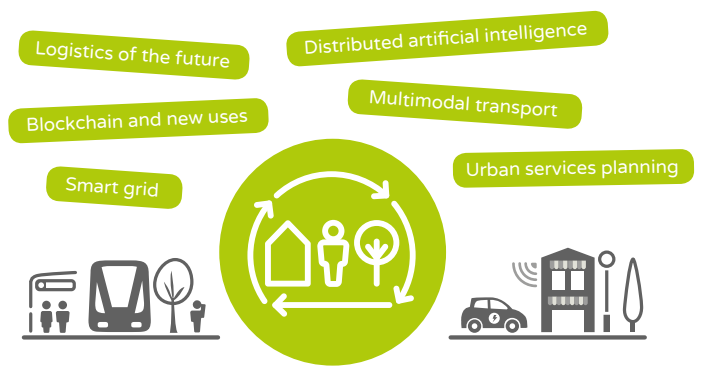
## Agile Industry or the digital transformation of industrial processes

Methods, processes and software tools for digital simulation for robust and optimized design and the life-cycle of complex systems.



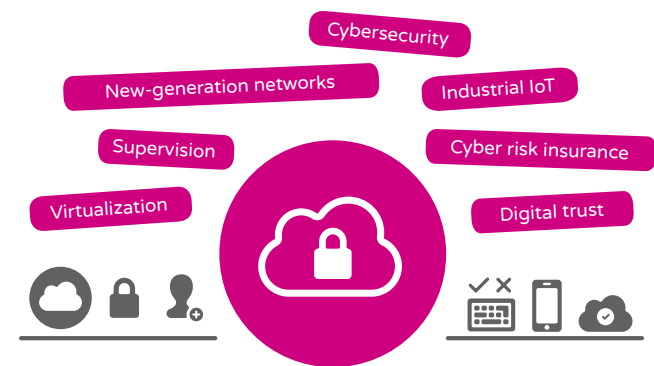
## Autonomous Transport or the design of safe and secure intelligent transportation systems

Studies and simulations of safe and secure new architectures incorporating artificial intelligence for connected autonomous transport adapted to new uses.



## Smart Territories or the user at the center of tomorrow's territories

Decision-support tools for optimisation and operational planning of smart and sustainable territories.



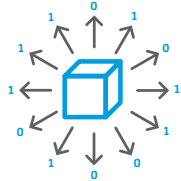
## Internet of Trust or digital trust in the "Internet of Everything"

Software and tools for security, control and optimum management of information systems.

# Offering Scientific Solutions

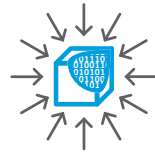
The scientific research at SystemX is focused on four scientific domains and addresses the main industrial challenges involved in digital transformation.

## 1 Data science and Interaction



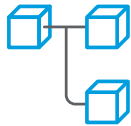
Understanding the real world through data

## 2 Scientific Computation and Optimization



Understanding the real world through physical modeling

## 3 Systems and Software Engineering



Formalizing complex systems design

## 4 Infrastructure and Networks



Ensuring exchanges between information system components

These four domains provide a framework for the scientific challenges and form the basis of SystemX's strategy. Beyond the skills of its researchers, engineers and PhD students, the institute is forging partnerships with all the laboratories of the Université Paris-Saclay and its ecosystem.

### SEMINAR @SystemX



SystemX welcomes renowned researchers to run a **Seminar@SystemX** each month to present a scientific topic around digital engineering. These seminars help to bring together the players in academic and industrial research.

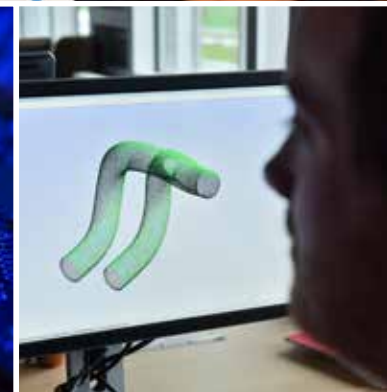
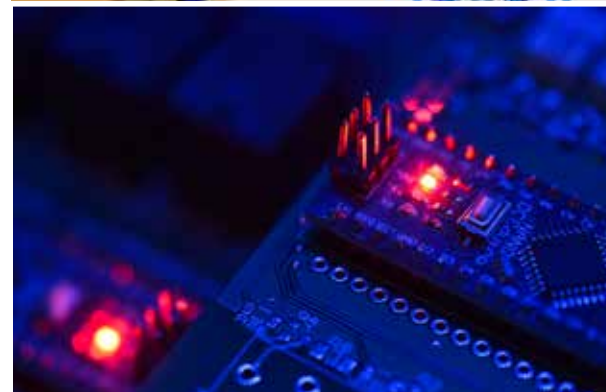


Each year, SystemX puts its PhD students in the spotlight with the **ThesisDay@SystemX** event. The idea is to give them the opportunity to talk about their work in front of an audience and during a poster exhibition.



SystemX identifies and structures the technological challenges to be resolved, and the scientific solutions to industrial problems.

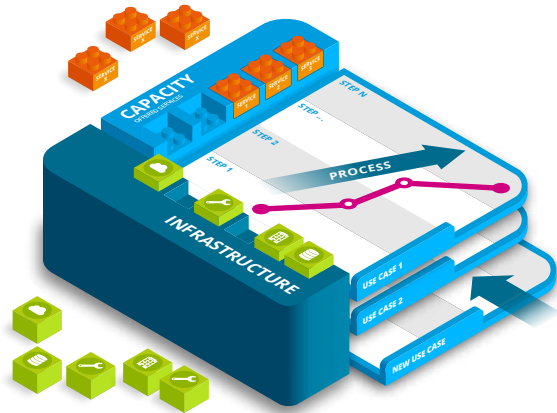
RESEARCH AND INNOVATION





# Sharing and Capitalizing on Technological Skills

## What is a technological platform?



SystemX has set up reference platforms on which the institute's teams create all the technological bricks developed in its projects. These platforms accelerate the finalizing and realization of prototypes that enhance the institute's research activities, ensuring re-use and dissemination of results.

## Typology of SystemX Platforms

**INTEGRATION AND FEDERATION OF SOFTWARE COMPONENTS**

Software platforms designed for the implementation of prototypes, evaluating and sharing components produced by research.

**MODELING AND SIMULATION OF CYBER-PHYSICAL SYSTEMS**

Platforms for modeling and simulating cyber-physical systems.

**TECHNOLOGY-AIDED METHODS AND PROCESSES**

Platforms for implementing processes, methods and tools for systems and software engineering.

SystemX's technological skills are organised around three domains representing different areas of expertise. Because SystemX's communities combine transversal skills and harness them to the institute's R&D projects over their lifecycles, they foster mutualization and valorization of the research.

## Three areas of expertise

**RESOURCES AND INFRASTRUCTURE**

Defines SystemX's information system strategy, particularly relating to big data management in the cloud and computing capacities, and makes the associated resources available.

**ARCHITECTURE AND SOFTWARE INTEGRATION**

Designs and integrates service-oriented software architectures of the proofs of concept studied within R&D projects, with a view to sharing and reusing them on the Institute's platforms to facilitate transfer to partners.

**DATA, UX AND INTERACTION**

Studies, designs and develops sector-specific use cases and proof-of-concept interactions, giving priority to the user experience to help research projects and partners to extract value from data and algorithms through use and form.



# Involving Startups in Research Projects



The START@SystemX initiative enables innovative startups to take advantage of the institute's innovation dynamic by joining its research projects.

Access to the large groups and technology suppliers enables them to build tomorrow's new services by experimenting and testing their technologies on concrete problems. START@SystemX relies on the combined academic and industrial strength at SystemX. In its search for agility, the institute offers several subjects linked to its research projects.

# Spreading Knowledge

SystemX supports education in digital systems engineering at institutions of higher education and research, tailored to the needs of industry.

## CRÉE PROJECTS



Integrated into SystemX research projects, the CRÉE (Cooperation - Research - Student - Enterprise) projects enable students to put their theory into practice by dealing with "market" problems. Each multidisciplinary CRÉE team is made up of three students who bring different skills (systems, data, simulation, IT, marketing, etc.) to the project they are involved in.

## SIMULATION ACADEMY



Under the SIMSEO program, steered by Teratec and Genci, SystemX was entrusted with the awareness and educational action that enables small and intermediate enterprises to identify the usage and deployment challenges of digital simulation in their businesses.

[www.simseo.fr](http://www.simseo.fr)

## KEY ACADEMIC PARTNER



### Université Paris-Saclay

- 360 state-of-the-art laboratories
- 14,000 publications per year
- 45 masters disciplines
- 200 startups
- 5,500 doctoral students
- 15% of French research
- 400 international agreements

## MAIN CLUSTER PARTNER



### Systematic Paris Region cluster

- 480 SMEs/20 intermediate-sized enterprises
- 150 large corporations
- 140 higher education and research establishments
- 20 local and government authorities
- 20 investors

# The IRT association



In March 2015, the IRTs decided to form an association called the **French Institutes of Technology (FIT)**. This association brings together eight French IRTs focused on four key values:



Teamwork



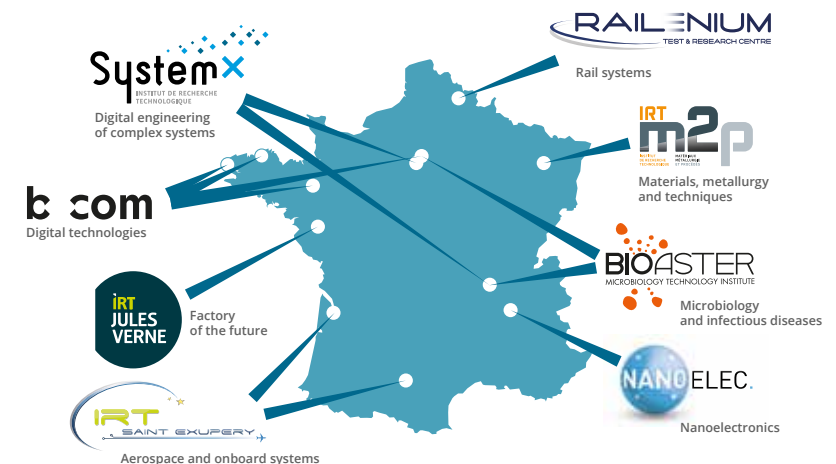
Creativity



Agility



Results





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