Press release
Cachan, 7 July

ESTP announces the creation of a "Digital twins of construction and infrastructure in their environment" Research Chair in partnership with Egis, Bouygues Construction, Schneider Electric, BRGM, SNCF Réseau and Arts et Métiers.

ESTP is joining forces with Egis, Bouygues Construction, Schneider Electric, BRGM, SNCF Réseau and Arts et Métiers to form an unprecedented alliance of stakeholders who are among the leaders on their respective markets right across the construction projects value chain and lifecycle of buildings and infrastructure.

Their partnership will not only pave the way for joint progress on subjects at the interface of their respective activities thanks to a shared vision of digital twins, but also provide clarification of the challenges of the digital transition, particularly in terms of research activities, as a means of improving performance in the construction sector and contributing to environmental issues. For the ambition of this Research Chair is to drive forward the sector's digitization by overcoming critical technological hurdles and unlocking optimization solutions for more sustainable and resilient infrastructure.

The digital twin: a platform of sustainable services for efficient and responsible local areas and buildings

The construction trades must keep pace with the times by optimizing engineering approaches, operational processes and the lifecycle of infrastructure. In response to these new requirements, the digital twin represents a solution for centralizing, organizing and securing a project's datasets, rallying a project's stakeholders around a collaborative venture and spearheading the development of services tailored to end users' needs.

By combining simulation, artificial intelligence and data, it simulates the behavior of projects in a dynamic fashion, reflecting the reality on the ground. In this way, the digital twin allows real-time management of buildings, showcases the interactions between systems and objects and enables optimization of the impact that buildings have on their environment through their construction and operation.

Designed like a platform of sustainable services, this digital model is a genuine decision support tool.

It contributes to the **construction sector's transformation** by addressing **4 pressing issues** of our time: managing and monitoring the decarbonization of the sector and its environment, maximizing the performance of buildings with account taken of users' expectations, ensuring the sustainability of constructions and rolling out lasting improvements across cities.

A chair with a brand-new format, for the sake of constructability

The purpose of the "Digital twins of construction and infrastructure in their environment" Chair **is to uphold a holistic and shared vision of the subject – from knowledge to applications in practice – which fosters a shared industrial and scientific output.**

Through this close partnership, it will be possible to fund innovation and research programs aimed at achieving a high international profile.

6 key research and study **themes** have been defined:

- organization of datasets used and sourced from the digital twin during the building's life cycle;
- digital continuity applied to digital twins: interoperability of models and data;
- architecture of digital twins: link between the physical building and the DT;
- the digital twin as an enhanced decision support tool (Artificial Intelligence and simulation)
- contribution of digital twins to the energy and green transition
- governance of digital twins: data protection and cybersecurity

"In light of society's main challenges, we need to reinvent how we build by comparing perspectives and expertise from all links of the sector's value chain. This is what drives us and brings us together around this Chair initiative."

Martine Jauroyon, Business Transformation and CSR Director, Egis Group

"The partnerships in connection with Bouygues Construction's innovation policy that we have forged with such research organizations as MIT, Stanford, the Cambridge Service Alliance, Centrale Lille and now ESTP and Arts et Métiers are a tremendous collective opportunity in terms of R&D to swiftly roll out the digital and green transition of the construction sector."

Thiébault Clément, R&D Director, Bouygues Construction

"This Chair forms part of a policy to significantly develop research activities by strengthening teams and launching several new chairs over the coming year. A momentum which will help to build more bridges between researchers and professionals, scale up partnerships with businesses and promote research and training initiatives."

Joël Cuny, Chief Executive, ESTP

"This Chair will contribute to our digital development strategy and particularly data management regarding the urban subsurface and its interfaces with buildings. This will accelerate the development of our cluster on digital twins and geo-environmental data in Orléans."

Philippe Freyssinet, Strategy and Research Director, BRGM

"The Digital Twins Chair embodies our ambition to contribute to the whole life cycle of buildings and infrastructure for greater efficiency and an improved environmental footprint. We are committing to this partnership between ESTP researchers and our software publishing activity to advance interoperability, collaboration and decarbonization. We aspire to help facilitate adoption of the digital twin. Through our 3D activities of electricity grids, 6D BIM activities using RIB Software and management of 7D BIM maintenance and operations by Planon Software."

Marc Nézet, Senior Vice President Energy Management Software Transformation, Schneider Electric

"This chair is in perfect harmony with the strategy of SNCF Réseau to transform design, modernization and operation of our railway network thanks to the Digital Twin.
This collaboration will allow us to go even further in decision support and real-time management, in order to answer the societal challenges that we face."

Patrick Offroy, Asset Management Technical Director, SNCF Réseau

"This alliance is an opportunity to broaden the expertise of the Arts et Métiers laboratories in the field of digital twins to encompass construction and sustainable cities with ESTP and leading industrial partners. The Chair's deliverables will also inform Arts et Métiers' training activities to empower our young engineers in the technologies of the future."

Laurent Champaney, President, Arts et métiers

About ESTP Paris:
ESTP Paris is a private engineering Grande École, with the status of a non-profit association governed by the Act of July 1, 1901. Founded in 1891 and recognized by the State for its public service missions from 1921, it became an EESPIG (Private Higher Education Institution serving the General Interest) and is bound by a contract with the French Ministry of Higher Education, Research and Innovation.
With 45,000 graduates including 32,000 engineers, 3,000 students in initial education and 1,000 interns in continuing education every year, ESTP Paris is the school which trains the most professionals in the construction, spatial planning, real estate and energy efficiency sectors in France. The school delivers degrees providing two to eight years' higher education, with student or apprentice status, including internationally recognized certifying programs and lifelong training. The engineering degree, accredited by the French engineering qualifications committee (CTI) since 1934, is the school's flagship course.
ESTP Paris groups together its research & innovation activities within the Constructability Research Institute (IRC, founded in 2009), which is a host team (EA) of Université Paris-Est's "Science, Engineering and the Environment" (SIE) Doctoral School.
What sets the school apart in all of its training and research-innovation activities: its very close ties with businesses and its broad international perspective (88 partner universities in 39 countries across every continent).

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Find out more at https://www.estp.fr/ and @estpparis

About Egis:
An international stakeholder in the mobility services and construction engineering sectors, Egis designs and operates intelligent buildings and infrastructure capable of tackling the climate emergency and the major challenges of our time, by contributing to more balanced, sustainable and resilient territorial development.
Egis harnesses all of its expertise for the benefit of the community and makes cutting-edge innovation available to all projects throughout their lifecycle: consulting, engineering and operation. Through its wide-ranging spheres of activity, Egis is a key stakeholder in the collective organization of society and the living environment of its inhabitants worldwide. In 2020, Egis posted revenues of €1.07bn and boasts a 16,000-strong workforce.
To share its expertise, in July 2020 Egis published a "White paper on the Digital Twin by Egis", an inventory of the expertise and skills developed by the Group.

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Find out more at https://www.egis.fr/ and @egis

About Bouygues Construction:
With 58,000 responsible and committed employees working across more than 60 countries, Bouygues Construction designs, builds and operates projects in the building, civil works, energy and services sectors. A leader in sustainable construction, the Group considers its primary added value to be shared innovation and gives top priority to health and safety. It has pledged to cut its greenhouse gas emissions by 30% by 2030 and provides its customers with an extensive choice of low-carbon solutions.
In 2020, Bouygues Construction posted revenues of €12bn.

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Find all of our news at https://mediaroom.bouygues-construction.com and @Bouygues_C

About Schneider Electric:
Schneider's purpose is to empower all to make the most of our energy and resources, bridging progress and sustainability for all. We call this Life Is On.
Our mission is to be your digital partner for Sustainability and Efficiency. We drive digital transformation by integrating world-leading process and energy technologies, end-point to cloud connecting products, controls, software and services, across the entire lifecycle, enabling integrated company management, for homes, buildings, data centers, infrastructure and industries.
We are the most local of global companies. We are advocates of open standards and partnership ecosystems that are passionate about our shared Meaningful Purpose, Inclusive and Empowered values.

Find out more at https://www.se.com/fr/fr/ and @SchneiderElecFR

About BRGM:
BRGM, the French geological survey, is France's leading public institution for Earth Science applications for the management of surface and sub-surface resources in a sustainable development mindset. Partnered with myriad public and private stakeholders, BRGM focuses on scientific research, supporting public policies and international cooperation. The institution's 700 or so engineers and researchers draw on their geological expertise to respond to the sub-surface challenges of the 21st century: management of natural and man-made hazards for spatial development, management of groundwater, subsurface and energy transition and mineral resources and circular economy.

Find out more at www.brgm.fr and @BRGM_fr
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About SNCF Réseau:
SNCF Réseau is the operator of France's National Rail Network. Acting in the general interest by meeting the growing demand for mobility and supporting the opening-up of the passenger and freight market, SNCF Réseau develops rail services over the 30,000 kilometers of National Rail Network line for which it is responsible in terms of management, maintenance, modernization and safety. Drawing on its human, tangible, intangible and financial resources, SNCF Réseau is developing a comprehensive range of services for its customers. The lines are developed, maintained, secured and modernized to ensure that their operation paves the way to values shared between all stakeholders.

About Arts et Métiers:
A leading technology institution, Arts et Métiers has 8 campuses and 3 institutes. Arts et Métiers' main missions are to provide training for engineers and industrial executives and conduct research. Every year more than 6,000 students benefit from its training

ranging from 3 to 8 years of higher education. Through its programs, 14 laboratories and partnership-based research, Arts et Métiers is a socio-economic stakeholder serving the interest of local areas.

Find out more at https://artsetmetiers.fr/ and @ArtsetMetiers_