D2C

DATAIA CLUB CONNECTION

EXPLICABILITY CAUSALITY

October 22, 2020

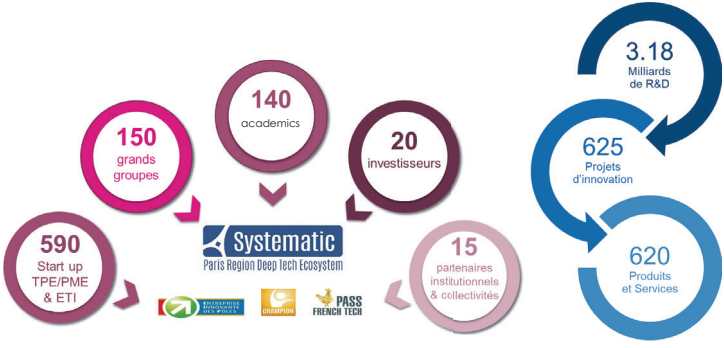
Systematic
Paris Region Deep Tech Ecosystem

université PARIS-SACLAY

INSTITUT DATAIA
Science des données, Intelligence & Société

Systematic and the « Data Science & Artificial Intelligence » Hub

Systematic, the European Deeptech cluster, brings together an efficient ecosystem with over 900 members. It enables its members to come together around technological and/or business-oriented topics.



Data Science & AI

Its «*Data Science & Artificial Intelligence*» technology hub brings together more than 160 academic partners, SMEs and large corporations around the following seven priority themes :

- **Trusted AI**
- **Evaluation of AI systems**
- **Learning algorithms**
- **Causality versus correlation**
- **Hybrid AI**
- **Data for AI**
- **Embedded AI**

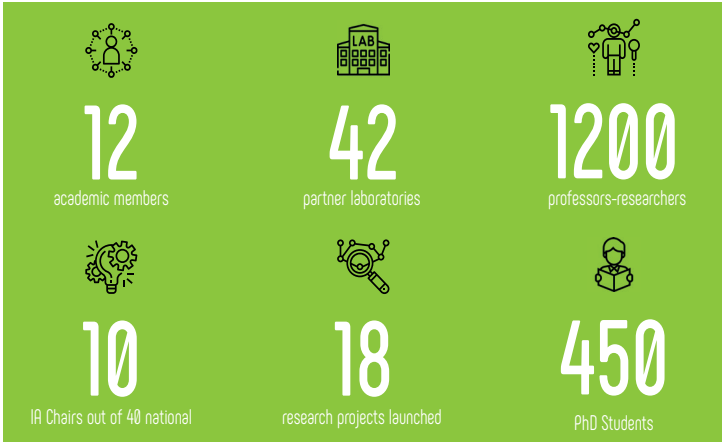
The DATAIA Paris-Saclay Institute

Located within the Paris Saclay University (16th in the Shanghai ranking, 1st in mathematics), it is the first French ecosystem in data sciences, AI and their societal impacts.

MISSION

To bring together multidisciplinary expertise and boost the collective strength of its partners in the Paris-Saclay cluster with the aim of combining big data and AI technologies with social sciences and humanities for an AI at the service of humans.

IN FIGURES



Industrial Affiliation Plan (PAI)

The Industrial Affiliation Plan (IAP) aims to boost the collective strength of the Institute's academic ecosystem and its industrial members. The services offered in response to the respective needs expressed include:

- Joint actions to support research;
- Sharing of experiences and collective needs;
- Facilitated access to recruitment;
- Access to training, seminars, workshops, etc.;
- Implementation of dedicated events (hackathons, challenges, etc.);
- Access to working places to increase exchanges.

DATAIA Club Connection (D2C)

The D2C system aims:

- **Upstream**, to present the priority research issues and to match them with the problems of industry;
- **Downstream**, to monitor contacts and opportunities for collaboration identified until they are set up and launched.

It is part of the ambition to facilitate the establishment of several levels of collaboration and create a constructive dynamic:

1. Expertise / Student projects / Internships
2. Research collaborations / CIFRE theses
3. Joint laboratories / Joint teams
4. Multi-partner chairs

Objectives and program

The main objectives of the D2C «*Causality*» to be addressed focus on aspects of causality - from predictive models to causal models:

- Common definition to make clear the difference with explainability issues;
- Why: what some can do and not others;
- How to build a causal model.

2pm - 2:05pm	Introduction by Bertrand Braunschweig - Inria Director and President of the DS&AI Systematic Hub
2:05pm - 3:05pm	State of the art by Michele Sebag (CNRS, Université Paris-Saclay, LRI) «Causal modelling & machine learning» and Julie Josse (Inria, CMAP) «*Causal effects treatments theory*»
3:05pm - 3:45pm	Pitch: points of view of researchers and industrialists - research angles, needs, issues
3:45pm - 4:45pm	Brainstorming: collective construction of topics of general and shared interest
4:45pm - 5:45pm	Deepening in small committees in order to identify topics for bilateral projects
5:45pm - 5:50pm	Conclusion and action plan

DATAIA researchers

Causal modelling & Machine learning

Michèle Sebag (CNRS, Université Paris-Saclay, LRI)
Research: inference and learning, symbolic and numerical approaches to AI.

How to estimate a causal effect from observational data?

Julie Josse (Inria, CMAP)
Research: missing data, causal inference, estimation of heterogeneous intervention effects, personalized medicine

Causal inference in information theory and statistics

Pablo Piantanida (CentraleSupélec, L2S)
Research: deep learning, information representation, inference mechanisms

Identification of causal factors/variables in a model

Myriam Tami (CentraleSupélec, MICS)
Research: modeling, machine learning, complex and heterogeneous data

DATAIA researchers

Causal inference from a statistical perspective: estimation and model selection

Bertrand Thirion (Inria, Neurospin)
Research: statistical modeling and machine learning applied to brain imaging data

Counterfactual inference to estimate treatment effects

Blaise Hanczar (Evry University, IBISC)
Research: deep learning, supervised learning, prediction systems, performance evaluation

Solving discrimination and regression problems, studying causal relationships

Isabelle Guyon (Université Paris-Saclay, LRI)
Research: Support Vector Machines (SVM), statistical data analysis, pattern recognition, statistical learning automation

DATAIA Club PAI Companies

Elements of causality to understand predictions from medical images

GE Healthcare

Nicolas Gogin - *Deep learning and image analytics*
Jorge Hernandez Londono - *Staff Software Engineer*

Interpretation of car crash calculation results, search for root causes

GROUPE RENAULT

Yves Tourbier - *Optimization and decision support expert*
Benoit Laussat - *PhD Student*

Causal inference to inform Model Based Clinical Drug Development

SANOFI

Departement R&D Digital and Data Sciences

Franck Auge - *Translational sciences, Bioinformatics*
Caroline Cohen - *Strategy and Business Lead Europe*
Paolo Piro - *Clinical Data Sciences*
Bernard Sebastien - *Clinical Modeling and Evidence Integration*

Departement Molecular Design Sciences
Hervé Minoux - *In-Silico Science activity*
Bruno Filoche - *Compounds Data-Science activity*

SERVIER

Charles Hebert - *Director of R&D Data Driven Program*

Institutional partners

cap·digital
Paris Region

CHOOSE
PARIS
REGION

Finance
Innovation
Pôle de compétitivité mondial

HUB
FRANCE IA

Systematic
Paris Region Deep Tech Ecosystem

SATT
PARIS-SACLAY
L'innovation en confiance

System X
INSTITUTE OF RESEARCH
AND TECHNOLOGY

Institut Convergence 17-CONV-0003 INSTITUT DATAIA (I2DRIVE)

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