LabEx DigiCosme

Results and Perspectives

Florence d'Alché-Buc (LTCI, Télécom ParisTech),
Pierre Duhamel (L2S, CentraleSupelec)

Partners involved in DigiCosme

Partners:

Laboratories:

Scientific scope of DigiCosme

Sustainable software
Stefan Haar (INRIA and LSV)
Florent Kirchner (CEA-LIST)

1. security of systems

2. continuous versus discrete systems: models and verification

3. from high-level to low-level certification : combination and cooperation of verification techniques

Communications networks
Ghaya Rekaya Ben Othman (LTCI -Telecom ParisTech)
Steven Martin (LRI-CNRS-UPSud)

1. network information theory : coding, security and caching:

2. future Access Network : Cloud, Ran and Optimization problems

3. distributed networks : storage, Computing, Security and Privacy

4. optical Communication : signal Processing, Coding and Networks

DataSense
Céline Hudelot (MICS, CentraleSupelec)
Bertrand Thirion (INRIA-neurospin)

1. scalable, expressive and secure tools for large-scale data

2. making sense of complex, heterogeneous data and knowledge

3. machine learning : meta-learning and multi-task

4. interaction and visualization

Organization - Governance

Scientific coordination

- **Head:** Florence d'Alché-Buc (LTCI, Télécom ParisTech)
- **Deputy head:** Pierre Duhamel (L2S, CentraleSupelec)

Administrative and financial manager: Catherine Dal Balcon
Communication: Isabelle Huteau

Education Committee

- Bruno Defude (SAMOVAR, Télécom Paris Sud)
- Franck Quessette (DAVID, U. Versailles Saint-Quentin)

Research and Innovation Committee

- Véronique Benzaken (LRI, CNRS, U. Paris-Sud)
- Pierre Zweigenbaum (LIMSI, CNRS)

A changing environment

In the context of

- IDEX Paris-Saclay University to be re-evaluated before 2020
- NewUni: a new institute around Ecole Polytechnique
- DATAIA started in January 2018
- First outcomes of IRS

The ANR Call for Evaluation and renewal of labEx has been launched: deadline sept 2018.

Main Actions - 2 call for projects /year

Education

- ▶ 1 yearly Computer Science Competition at Lycée level
- ▶ About 15 yearly Excellence Master Grants
- ▶ 9 Invited professors (+6 to come)
- ▶ 1 Thematic Summer School, Junior Conferences

Research

- ▶ **6 Emergence projects (support for new incoming PI)**
- ▶ 30 PhD theses, 20 postdocs and engineers (+5 to come)
- ▶ 8 doctoral and post-thesis missions
- ▶ 30 working groups

Innovation

- ▶ Collaboration with Systematic, co-funding Paris-Saclay SATT

A quick eye on the budget

Total budget : 9M euros

- 2017: 1.4 M euros (Research:1M)
- 2018: 1 M euros (Research:0.6M)
- 2019: 1.3 M euros

Reaping the benefits of a 6-year project

On the side of governance

- Governance now well balanced among nearly all the partners, each responsibility is shared by two persons, external/internal reviewers
- Calls for projects have been simplified and gathered
- Quality of submissions is increasing
- Some actions have been tested and then abandoned (post-thesis funding)
- Some others have been introduced (Junior Conferences) and adopted by the community

Reaping the benefits of a 6-year project

On the side of education

- Computer Science Competition at the Lycée level: bridging the gap between Lycée and University
- Linking master students to research
- Invited international guests: research and training
  - PhD tracks: excellence master grants lead to PhD
  - Best PhD student paper/production award

Reaping the benefits of a 6-year project

## On the side of scientific research

- Structuring effect: for instance, formal methods in Paris-Saclay; IRS 5G; DATAIA preliminary
- Leverage effect: towards larger projects
- Emerging topics:
  - bottom-up strategy: the call for working groups is a success
  - **new step since 2016**: postdoc call=opportunity to rapidly explore a new subject and the potentials of a new collaboration with a Working Group
  - Working group on e-health, upcoming Thematic School on Machine Learning and Formal Methods...

Leverage effect

- **From DigiCosme Projects to ERC grants**
  - Michele Wigger (LTCI), Alexandre Gramfort (INRIA-Saclay-LTCI), **Antoine Girard (L2S): Emergence project "CODECSYS"**
- **From DigiCosme Projects to ANR**
  - GoAsq: French-German ANR Project on Natural Language Processing (2015-2019) led by LRI and LIMSI, directly derived from two working groups in DataSense axis.
  - Addicte : ANR project (2018-2021) : LS2N Nantes with CEA List and LIMSI directly derived from two working groups in DataSense axis.

Collaborations between laboratories whatever the side of N118
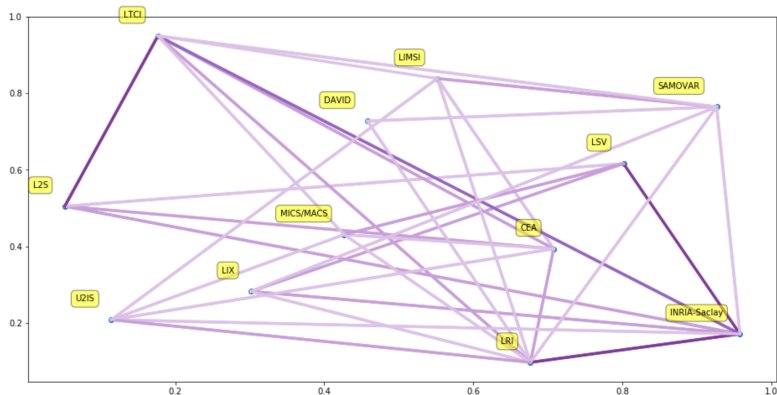
LABEX=A major tool for collaboration on the campus

Outline

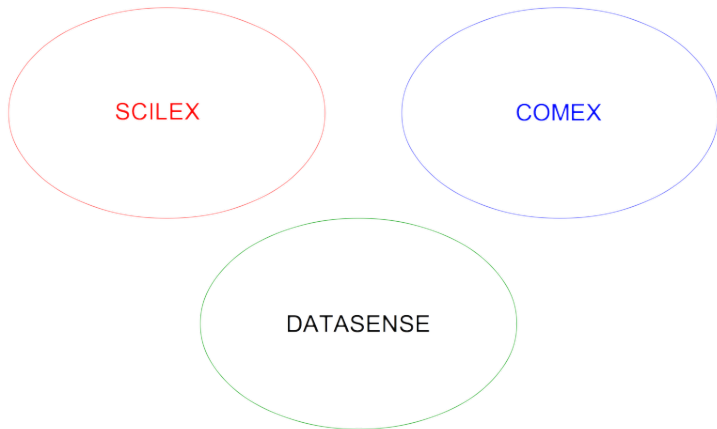# Evolution: challenges and opportunities

- Cybersecurity
- Internet of things
- Artificial intelligence
- E-Health
- Smart Cities
- Industry of future
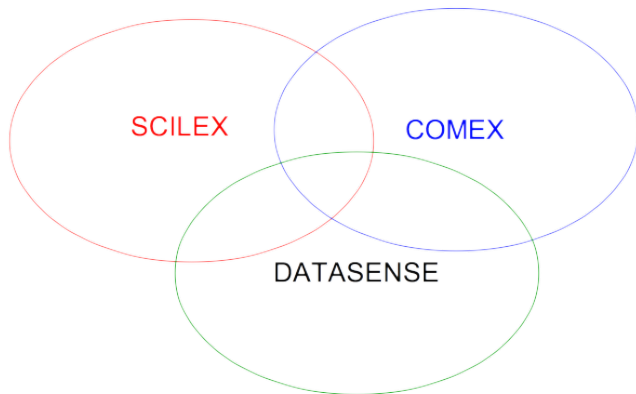
All challenges that require competences in the 3 axes

Evolution: scientific axes

Maturity of each axis

Evolution: scientific axes

A role to play at the interface of axes

Evolution: new actions

Thematic evolution

- Slightly reshape axes: include algorithmics
- Foster collaborations between axes to solve big ICST challenges: **Cybersecurity**, **IOT**, **AI** ...
  - cybersecurity: formal methods, networks, machine learning
  - trusted ai: machine learning and formal methods

Increase impact

- Task Force on a few target topics: more funding on key domains
- Encourage projects with impact on other fields (biology, health, climate/environment, chemistry,physics)
- Promote reproducible science, propagation of software libraries
- Work in concert with other instruments/tools (joint actions with DATAIA)

Evolution: proposed Perimeter

All labs/partners already involved:

+ INRA (Maiage), AgroParisTech (MIA), University of Evry (IBISC)

Many thanks to

- Catherine Dal Balcon, the financial manager without whom nothing will be possible
- Isabelle Huteau (communication and organization of the days)
- the whole DigiCosme Team and orators
- our scientific council !