PERSYVAL-Lab
Pervasive Systems and Algorithms

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## Scientific coordinator of the LabEx

PERSYVAL-Lab

- LabEx (Laboratoire d'excellence) of *Université Grenoble Alpes*
  - 12M Euros for 8 years (March 2012 to December 2019)
  - 800 researchers and academics
  - 10 research laboratories covering a large spectrum of competencies: mathematics, computer science, signal processing, control and hardware architecture.

- Ambition: federate computational sciences in Grenoble
  - to design novel systems and algorithms at the **convergence of physical and digital worlds**

Scientific program

structured by **4 research actions** conducted by integrated multi-disciplinary small and effective teams
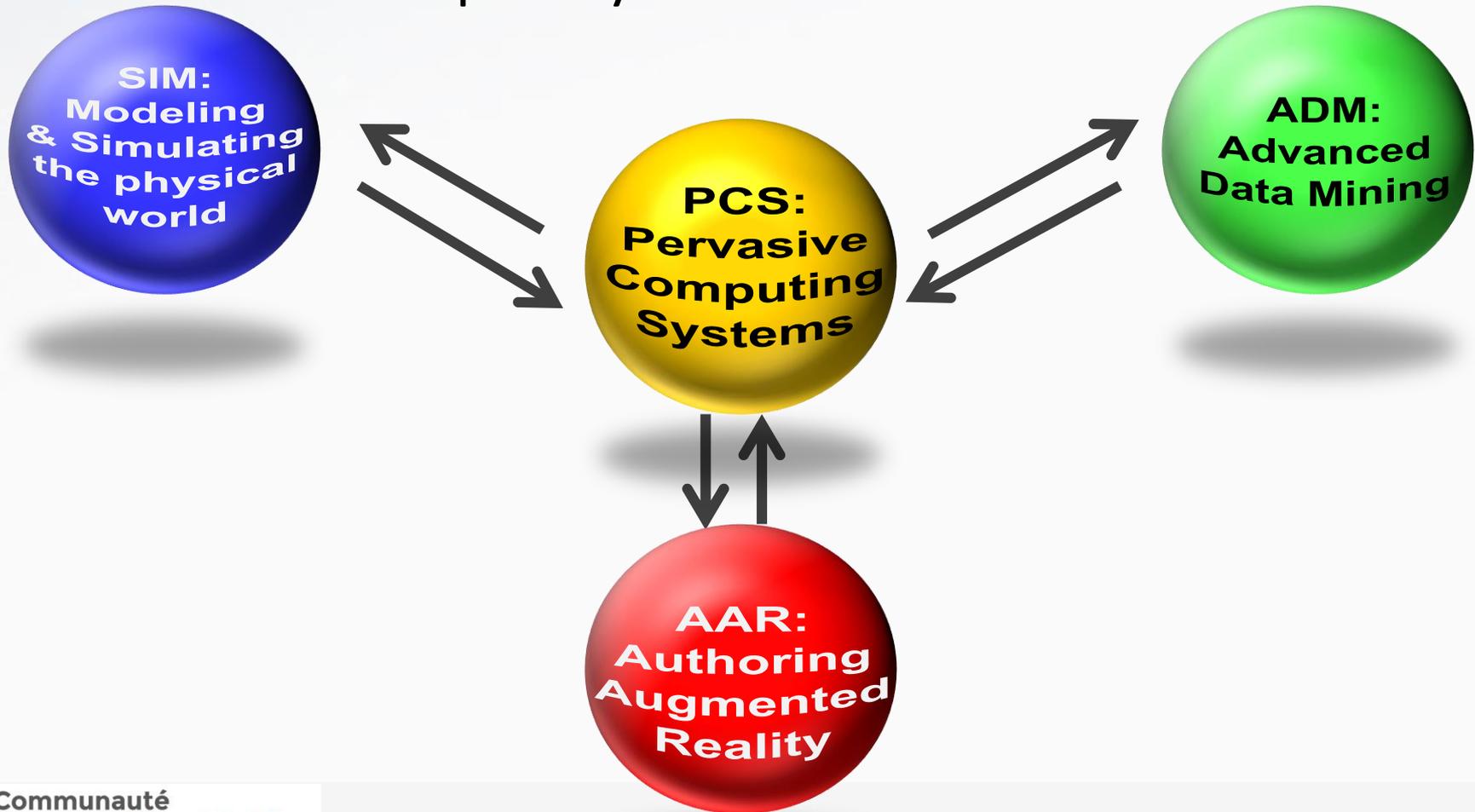
Strategy and funding policy

- Create a collective dynamics across the **research laboratories** and **academic programs** in the LabEx scope
  - build **multidisciplinary research** and **pedagogical teams** to tackle the cross-disciplinary challenges of the LabEx program
  - through different calls for projects
- Increase the Grenoble **attractiveness** and **visibility** in **computational sciences at large**
  - master and PhD grants
  - PERSYVAL-Lab summer schools
  - Jean Kuntzmann Prize

Research projects calls

- Different project types but a common principle:
  - collaboration between at least 2 laboratories to encourage cross-disciplinarity and cross-fertilization

- 3 types of projects
  - Exploratory projects (call every year)
    - ❖ **21 ended, 15 ongoing**, **8 just started (2017)**
  - Project-teams (call every two years) *last call in 2016*
    - ❖ Multi-laboratories teams working together for 3,5 years to contribute to one of the workpackages of the LabEx program (budget : 250.000 Euros)
    - ❖ **5 ending, 10 ongoing**
  - Co-supervised PhDs (call every year) *last call in 2016*
    - ❖ **9 defended, 16 ongoing**
    - **+** 19 PhDs funded by project-teams
    - ⇒ **44 PdD funded by the LabEx**

More details in the scientific brochure https://persyval-lab.org/

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Overview through talks and posters

Exploratory projects

=> **poster session with Wine & Cheese (today, 6:00 – 7:30)**

Project-teams

=> **(long or pitch) oral presentations**

Co-supervised PhDs

=> **8 oral presentations + poster sessions at coffee breaks**

Schedule for oral presentations

AAR session: today 2:00-3:30
ADM session: today 4:30 – 6:00
PCS session: tomorrow 8:30 – 10:05
SIM session: tomorrow 11:00 – 12:30

Achievements

- More than **300 publications** and **200 people** involved in PERSYVAL-Lab's projects

- **Structuration** of existing but dispersed forces on some transverse topics with strong societal impact

  - Cybersecurity, data science, hybrid systems, low consumption high performance embedded systems, embodied augmented reality, social robotics, internet of everything

- **New synergies** between fundamental and applied computational sciences

  - Geometry and optimization, stochastic machines, modeling and certification of real-time systems, ultra-low power electronic systems

- **Leverage for industrial collaboration and transfer**

  - ARAMIS 2014-2017 (cybersecurity) with ATOS (PIA), DEMA (Nano2017 program, STMicroelectronics), PIA project with Kalray, Airbus and Dassault Aviation)

  - **Creation of Anatoscope startup (anatomic transfer)**

Promotion of research data sharing

- Creation of a platform for sharing research data at large scale (**PerSciDo_Grenoble_Alpes)**
  - a flexible infrastructure based on Linked Open Data principles
    - a working group has been launched in January 2015
    - support of the CNRS for hiring a software engineer, starting in September 2015, for 18 months , renewed for one year in May 2017
  - V1 open in September 2016

  https://persyval-platform.imag.fr/perscido/web/

  $\Rightarrow$ **towards a « data lab »**
    - **for <u>researchers </u>to test and compare different methods of data analytics on datasets of different size and nature**
    - **for training <u>students </u>in data science,**
    - **for providing data materials for <u>teachers</u>**

Roadmap for Education

- Promote multidisciplinary lab-oriented courses
  - to train students to the design of cyber-physical systems

- Increase the attractiveness of our training offer in computer science, control, mathematics and signal processing.

- A wide span of academic programs:
  - 5 engineering schools
    Ensimag, Phelma, ENSE3, Industrial Engineering, Polytech Grenoble
  - 3 university departments
    DLST, UFR IM^{2}AG and UFR PhITEM
  - 1 university institute of technology (IUT)

Actions

- Financial and human support for the development of mutualized experimental platforms
  - ❖ Computing infrastructure, Automatic control, Fablabs, Robotics, Vision
  - ❖ 1 dedicated engineer

- Setting up of multidisciplinary UEs at undergraduate level
  - ❖ Physical computing , Robotics, Bachelor summer program

- Master scholarship program
  - – 8000€/year/student, 10 scholarships/year
  - – main criteria: excellence and motivation for research

Educational platforms

- used by students from different background for building and implementing innovative projects.

- Web site and YouTube channel:

    persyval-lab.org/fr/platform

# International visibility and attractiveness

- PERSYVAL-lab summer schools
  - 5 editions: 36 summer schools
    - ❖ French-American Doctoral Exchange Seminar (FADEx) 2016 on Cyber-Physical Systems

- Creation of Jean Kuntzmann Prize
  - awarded every 2 years to a distinguished researcher for pioneering cross-disciplinary work in computational sciences
    - ❖ 2014 Laureate : Emmanuel Candès (Stanford University)
    - ❖ 2016 Laureate: Joachim Weickert (Universität Saarland)
  - series of lectures and reading groups

- Master and PhD grants

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Master and PhD students origin

Masters II

- Africa 4%
- Grenoble 17%
- Europe 22%
- America 13%
- Asia 44%

PhDs

- Asia 18%
- America 5%
- Grenoble 41%
- Europe 36%
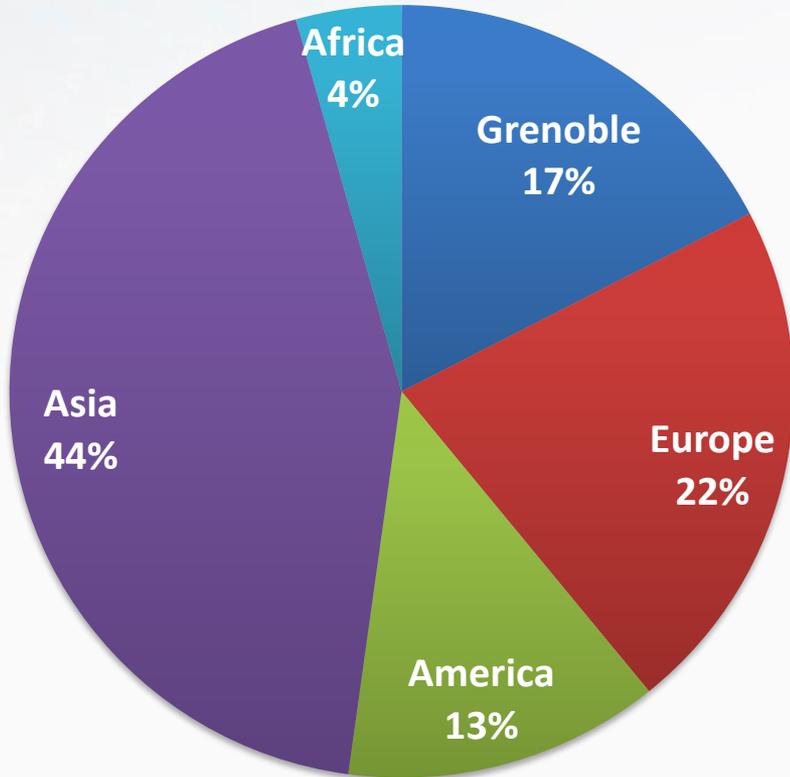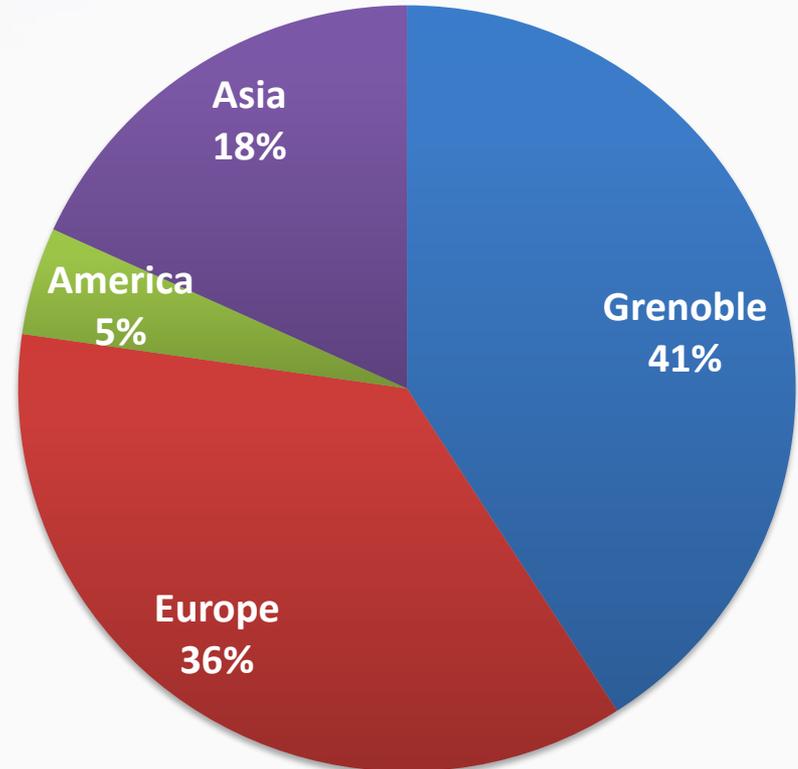
- 80% of the awarded master students are undergraduated from abroad
- 80% of the master laureates have been pursuing as PhD students in Grenoble

Budget allocation (2012-2019)

Unallocated 826 786 €

Summer Schools 273 023 €

Education 1693 132 €

Valorization 421 392 €

UGA management fee 673 873 €

Research : Co-supervised PhD 2700 500 €

Scientific Animation 726 645 €

Joint projects with UGA MSTIC 500 000 €

Research : Exploratory projects 494 650 €

Research : Actions-teams 3690 000 €

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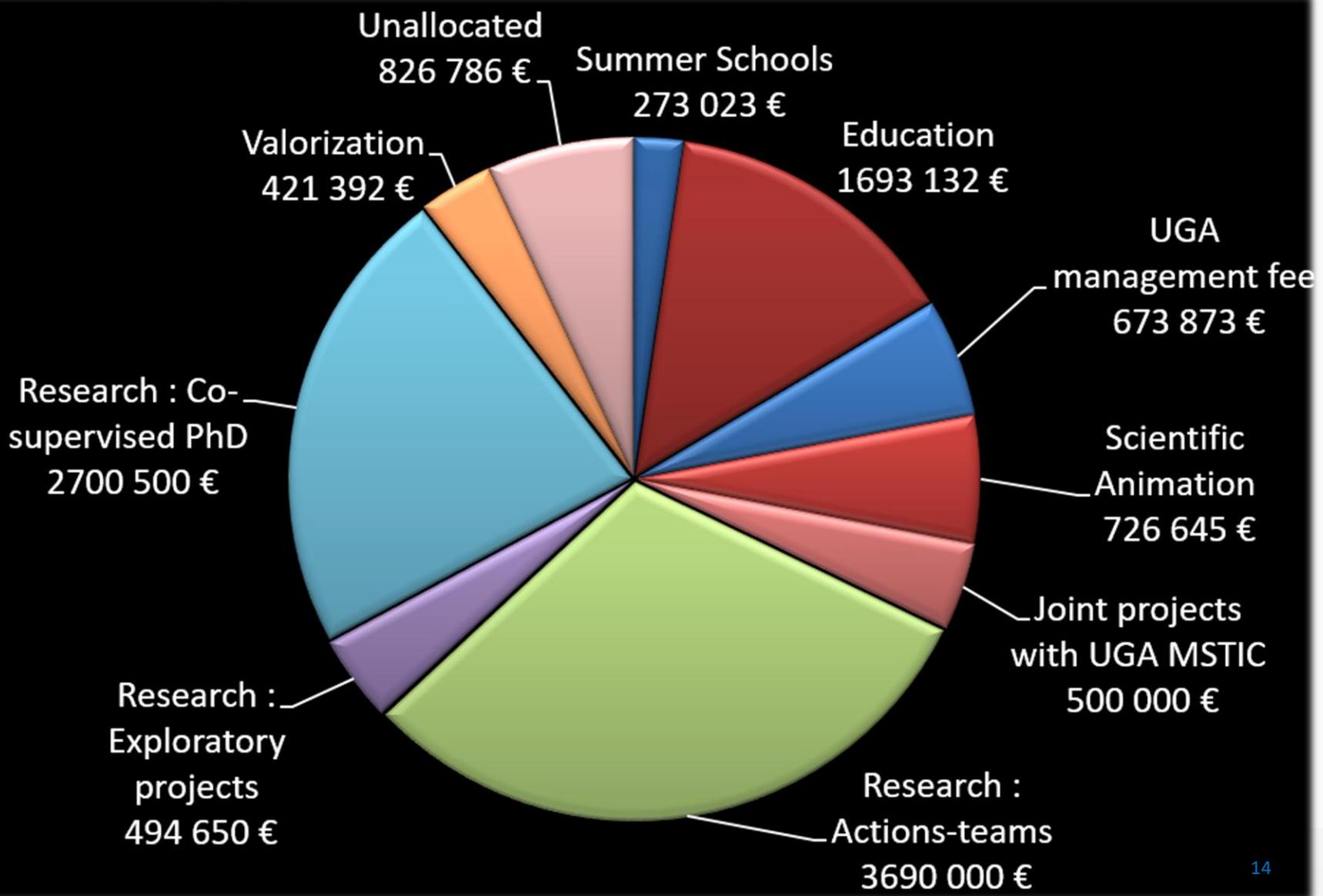
Time to prepare the future

Recommandation of the international jury in charge of the LabEx mid-term evaluation

We also recommend the definition of general guidelines for future structuring of the collaborations between partners, to ensure that the collaboration continues after the LabEx ends (for example, through the definition of new structures at the institutional level, new teaching programs, new grant proposals).

- 2016-2019 : Joint call for projects with the MSTIC department of IDEX UGA

- June 26, 2017: Joint application to the PIA 3 call for « Ecole Universitaire de Recherche » (EUR)
  - **Computational Sciences Grenoble Graduate School**

    => includes the renewal request of the integrated LabEx

Governance

Living force for the IDEX project (Mathematics and ICT)

UGA Governance

Steering Committee

10 Research Laboratories
- LIG
- G-Scop
- IF
- Inria
- CEA
- Gipsa-lab
- LJK
- TIMA
- TIMC-IMAG
- Verimag

9 Teaching Units
- ENSE3
- Ensimag
- Industrial Engineering
- Phelma
- Polytech'Grenoble
- DLST
- UFR IM2AG
- UFR PhITEM
- IUT1

Executive Committee

Board

Educational Board

Scientific Council

Advisory Board

4 Doctoral Schools
- EDISCE
- EEATS
- I-MEP2
- MST2I