Welcome to the

PDS and HPDA tracks!

Master in computer science of IP Paris

Gaël Thomas (PDS)
Pierre Sutra (PDS)
François Trahay (HPDA)

Institut Polytechnique de Paris

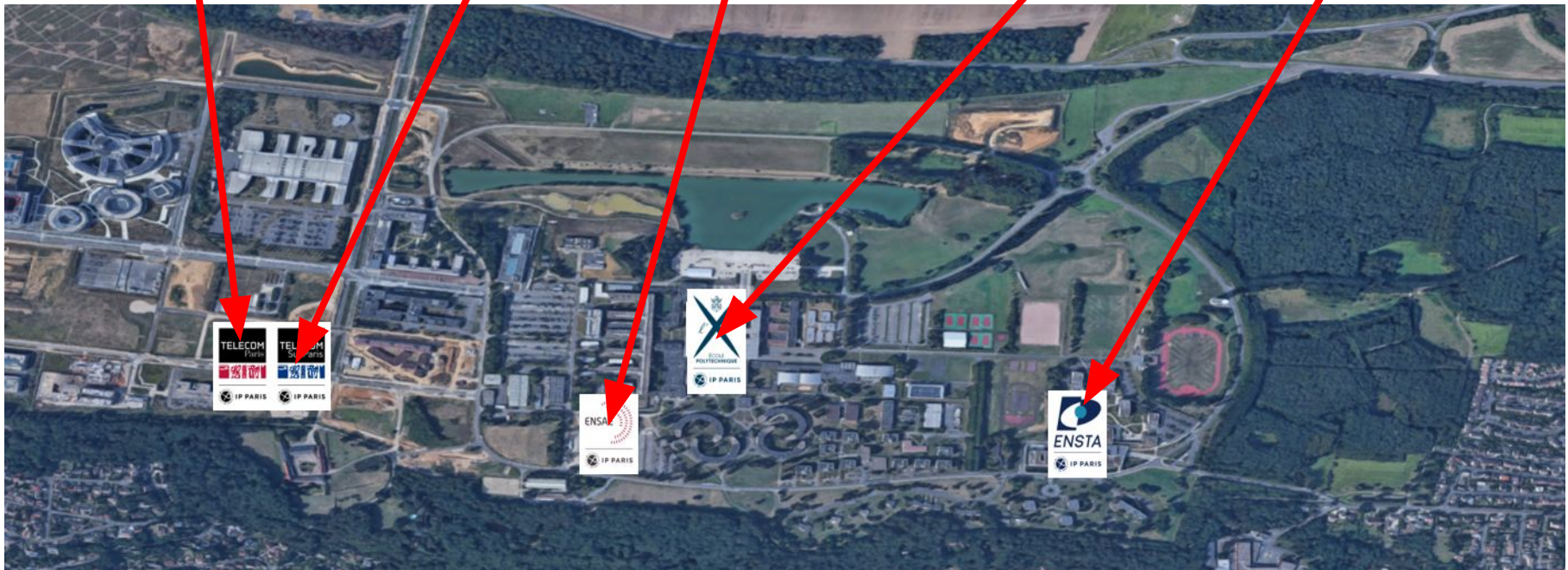■ Brings 5 french schools together

Telecom Paris   ENSAE Paris   ENSTA Paris

Telecom SudParis   École Polytechnique

PDS and HPDA tracks

- **Parallel and distributed systems**
  - Consists in distributing the computation over many computing units (from end devices to data centers) connected by networks
  - They are ubiquitous : IA applications, online games, social networks, web services, healthcare simulation...

PDS and HPDA tracks

- PDS track => focus on the **internals** of modern parallel and distributed systems in order to design them

- HPDA track => focus on the **use** of modern parallel and distributed systems in order to implement very large-scale computation

- Both tracks have a common set of fundamental courses, and
  - PDS specializes in parallel and distributed systems design
  - HPDA specializes in high-performance computing/data analytics

We are currently merging the tracks under the name PDS!
(but don't worry, you will still have your PDS or HPDA diplomas)

PDS and HPDA tracks

■ Goal of the track : understand how parallel and distributed systems are designed and implemented

- How we can make them **efficient**
- How we can make them **maintainable**
- How we can make them **correct**

Learn distributed systems from both a theoretical and a practical point of view

Study how we can leverage distributed systems to implement large-scale computation

PDS and HPDA tracks

- PDS and HPDA are **research oriented** tracks
  - Learn the last advances of the field
  - Prepare for a PhD through
    - Research projects with your professors (~ 40% of your time)
    - A master thesis of 6 months at the end of the M2 (internship)

- You will start to do research in 15 days!
  - **You can see the master as the first years of a PhD**
  - After the master, you are supposed to pursue with a PhD
    - But, of course, you can leave research and directly work in a company after the master
  - If you continue with a PhD, often, your research project advisor during the master will become your PhD advisor

Organization

■ The courses mostly come from the engineering tracks of the schools of IP Paris

■ In both M1 and M2 (master thesis excluded)
  - Scientific courses to learn new concepts (~50%)
  - Research seminars to know the last scientific advances (~10%)
  - Research projects in IP Paris' labs (~40%)

■ During the last 6 months of the M2
  - A master thesis in a research lab
  - Starts between february and march
  - A student can choose a research lab of IP Paris or of any other institute

PDS track   Welcome Session

The scientific courses

- A student can choose any course from the tracks
  - We don't distinguish the M1 and the M2 (but some courses are more basic than others)
  - A student can choose 7.5 ECTS from other tracks (provided that it makes sense)

- Very quickly (ideally today!), a student has to choose courses
  - The first courses (SLR201, SLR206) start next week :)

- Mandatory ECTS for the scientific courses
  - In M1: 27.5 ECTS in PDS, 37.5 ECTS in HPDA
  - In M2: 15 ECTS

The research seminar

■ Goal: learn the last scientific advances of the field

■ Each week, we have a research seminar the friday morning
- The students regularly present research papers
- For some of the seminars, we invite other researchers

■ Attending the research seminar is mandatory
- Except if you have another course at the same time
- And during the master thesis

■ Validation of the research seminar
- In M1 and M2 : 2.5 ECTS
- You will have a mark for each of your presentation

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The research projects

- The research project consists in learning research by doing research
  - Between 1 and 4 days each week in a research lab
  - Work with professors and PhD students of IP Paris on ongoing research projects
  - Mainly projects proposed by the professors of IP Paris, but you can also propose your own research project

- Evaluation: through a presentation and a report
  - In M1: 30 ECTS for PDS, 20 ECTS for HPDA
  - In M2: 12,5 ECTS

The research projects

■ Schedule
- 19/9/2023 at 10am: presentation of the research projects
- 26/9/2023: the research projects start
- 08/2/2024: final presentation for the M2/mid-term for the M1
- 23/2/2024: deadline for the research report for the M2 students
- 20/6/2024: final presentation for the M1 students
- 28/6/2024: deadline for the research report for the M1 students

The master thesis (internship)

- **M2 master thesis**
  - Mandatory (30 ECTS)
  - 6 months, usually starts in march or april
  - A student can continue his/her M2 research project
  - A student can also do a master thesis in any university
  - The student can also do an internship in a company if clearly research-oriented

- **You can also do a M1 summer internship**
  - Not mandatory, just a possibility
  - 1 or 2 months during the summer
  - Does not give ECTS
  - A student can continue his/her M1 research project during the internship

And after the master

- A student is supposed to continue a PhD thesis
  - The highest level diploma, recognized by all the main IT companies
  - 3 years, with a salary of roughly 2000 euros net/month
  - A PhD consists in doing research, just like during the master :)
  - After a PhD, a student can work in a company or in a university (80% in company, 20% in university)

- A student can also directly work in a company
  - In a research and development division or in a pure development division

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And now...

■   … let's choose your courses!

https://cs.ip-paris.fr/courses/tracks/pds/?page=../common/courses

https://cs.ip-paris.fr/courses/tracks/hpda/?page=../common/courses