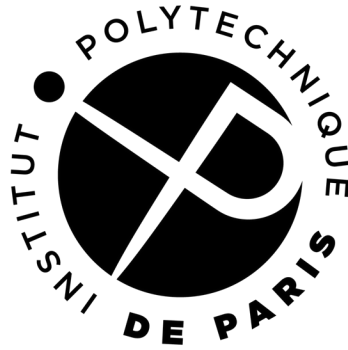




Master and PhD track in CS and DataAI

<https://cs.ip-paris.fr/master>

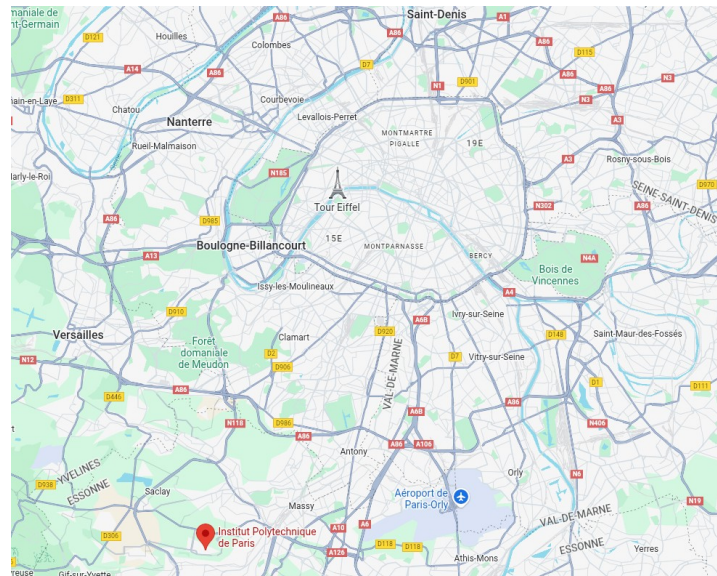
Institut Polytechnique de Paris (IP Paris)

■ French university founded in 2019

■ Composed of the top engineering schools in France

- Ecole Polytechnique, ENSTA, ENSAE, Ecole des Ponts, Télécom Paris, Télécom SudParis

■ Located in Palaiseau (south of Paris)



Master and PhD track in CS



Computer Science at IP Paris

- More than 200 permanent researchers in 6 laboratories
 - LIX, CMAP, U2IS, LTCI, Samovar, Lab-STICC
- Covers all the fields, from theoretical to practical research
 - Fundamentals in CS, networks, distributed systems, robotics, security, data analytics and artificial Intelligence, high-performance computing, human computer interaction, operational research, bioinformatics...

IPParis Master of Computer Science

■ Internationally highly ranked

■ A 2-year **research-oriented** program taught in english

- Scientific courses (~ 60% of your time)
- Research projects (~ 40% of your time)
- A 6-month research internship in a research lab
- Goal: prepare for a PhD

■ Research projects

- Spend between 1 to 4 days/week (both in M1 and M2)
- In a laboratory of IP Paris with PhD students and professors
- On cool subjects that you choose and enjoy!

Our master tracks

■ 9 different majors

- CSN: Computer Science for Networks
 - CPS: Formal methods and foundations of Cyber-Physical Systems
 - Cyber: Cybersecurity
 - DataAI: Data and Artificial Intelligence
 - FCS: Foundations of Computer Science (MPRI)
 - IGD: Interaction, Graphics & Design
 - MPRO: Operations Research
 - PDS: Parallel and Distributed Systems
 - QMI: Quantum, Mathematics, Computer Science
-
- In most tracks, you have a large choice of courses
 - and a large freedom: you can choose some courses from other tracks, or masters, or any engineering school of IP Paris

Computer Science for Networks (CSN)

■ Focus on network

■ Example courses

- Network programming
- Performance evaluation and metrics
- Distributed Computing Systems
- Network Security and Privacy
- Wireless network and IoT

■ Contact : Natalia Kushik <natalia.kushik@telecom-sudparis.eu>

Cyber Physical Systems (CPS)

■ Focus on formal methods for CPS

■ Example courses

- Real-time System Scheduling
- Safe Intelligent Systems
- Introduction to Control Theory
- Navigation for Autonomous Systems
- Introduction to the verification of neural networks

■ Contact: Sergio Mover <sergio.mover@polytechnique.edu>

■ Website: https://www.enseignement.polytechnique.fr/informatique/IPP_CPS/index.html

Cyber Security (Cyber)

■ Focus on the theoretical and practical aspects of cybersecurity

■ Example courses

- Security-Oriented Programming
- Introduction to Cryptology
- Compilation
- Introduction to Network Security
- Risk analysis and attack detection
- Secure protocols
- Systems and application security

■ Contact:

- Olivier Levillain <olivier.levillain@telecom-sudparis.eu>
- Sébastien Canard <sebastien.canard@telecom-paris.fr>

■ Website: <https://cs.ip-paris.fr/courses/tracks/cyber/>

Data and Artificial Intelligence (DataAI)

■ Focus on Artificial Intelligence (AI) and large-scale data management.

■ Example courses

- Logics and Symbolic AI
- Big Data Infrastructures
- Deep Learning
- Image mining and content-based retrieval
- Programming with GPU for Deep Learning
- Robust Computer vision with deep learning, XAI, Uncertainty quantification
- Text Mining and NLP

■ Contact:

- Fabian Suchanek <fabien.suchanek@telecom-paris.fr>
- Julien Romero <julien.romero@telecom-sudparis.eu>

■ Website: <https://dataai.telecom-paris.fr/>

Foundations of Computer Science (MPRI)

■ Focus on fundamental Computer Science.

■ Example courses

- Finite Automata Modeling
- Algorithms and Combinatorics of Geometric Graphs
- Proofs of Security Protocols
- Verification of Concurrent Programs
- Quantum Algorithms and Complexity

■ Contact:

- Samuel Mimram <samuel.mimram@lix.polytechnique.fr>
- Gilles Schaeffer <schaeffe@lix.polytechnique.fr>

■ Website: <https://mpri-master.ens.fr/doku.php?id=start>

Interaction, Graphics & Design (IGD)

■ Focus on human-computer interaction, computer graphics, and design.

■ Example courses

- Human-Computer Interaction
- Multiplayer Online Games Development
- Computer Animation
- Image Analysis & Computer Vision
- Making Physical Representation of Data
- Learning for Robotics

■ Contact:

- James Eagan <james.eagan@telecom-paris.fr>
- Amal Dev Parakkat <amal.parakkat@telecom-paris.fr>

■ Website: <https://diva.telecom-paristech.fr/igd/>

Master en Recherche Operationnelle (MPRO)

■ Taught in French

■ Focus on optimization and operational research.

■ Example courses

- Fundamentals of Optimization in Graphs
- Optimization in Uncertainty
- Advanced Combinatorial Optimization
- Constraint Programming
- Graphs, Matchings, and Colorings

■ Contact:

- Sourour Elloumi <sourour.elloumi@ensta-paris.fr>

■ Website: <https://uma.ip-paris.fr/mpro>

Parallel & Distributed Systems (PDS)

■ Focus on operating systems and distributed systems.

■ Example courses

- Operating Systems
- Advanced programming of multi-core architectures
- Parallel Programming
- Cloud infrastructure
- Distributed algorithms
- Distributed computing through combinatorial topology

■ Contact:

- Gaël Thomas <gael.thomas@inria.fr>

■ Website: <https://cs.ip-paris.fr/courses/tracks/pds/>

Quantum, Mathematics, Computer Science (QMI)

■ Focus on quantum technologies

■ Example courses

- ZX-Calculus
- Quantum Shannon theory: entropy, entanglement, communication
- Tensor Computations
- Quantum Compilation
- Quantum Machine Learning Engineering

■ Contact:

- Romain Alléaume <romain.alleaume@telecom-paris.fr>
- Augustin Vanrietvelde <vanrietvelde@telecom-paris.fr>

■ Website: <https://qurosity.telecom-paris.fr/qmi/qmi.html>

IPParis PhD track program

- A 5-year research-oriented program that combines master and PhD
 - A master during 2 year
 - A PhD thesis during 3 years
- Research project
 - Conduct a 2-year research project during the master
 - Personalized curriculum depending on the research project
- 3 types of scholarships
 - **Subsidize tuition fees (ST)**: fees reduced from ~7000€ to ~250€ per year during the master program
 - **Master's scholarship (BM)**: ST + a Master excellence scholarship (10 000€ / year)
 - **Full package (FP)**: (BM) + a 3 year PhD grant (approx 2000€ / month)
- 3 PhD Track programs related to Computer Science
 - Computer Science, Data&AI, Quantum Computing

Applying to IPParis

■ Master program

- Requires a Bachelor of Computer Science
- 3 application phases (January, April, May)
- European students apply in March via MonMaster

■ PhD track

- Requires a Bachelor of Computer Science
- Apply in January

Application: <https://www.ip-paris.fr/en/education/admissions>

Useful links

- Research in CS and DataAI at IP Paris: <https://cs.ip-paris.fr>
- Master and PhD track in CS: <https://cs.ip-paris.fr/master>
- Application: <https://www.ip-paris.fr/en/education/admissions>
- Contact: francois.trahay@telecom-sudparis.eu