

Master in Networks and Imaging Innovation and Engineering (MIR)

- “Imaging” track
- “Networks” track

Program objectives

The Master in Networks and Imaging Innovation and Engineering is one of the ICT (Information and Communication Technology) programs offered through the USPC (“Université Sorbonne Paris Cité”). Our Master’s program offers two tracks (specializations) in imaging or networks and aims to provide students with a double skills set in image processing and IT networks that prepares them for either a research or industry career. The program is open to students holding a Bachelor’s degree in engineering science, electronics, mathematics, IT and physics. It is also open to students coming from engineering schools with a background in ICT.

The first year of the Master (M1) is common to both tracks and aims to provide students with the basic scientific knowledge of image and signal processing, telecommunications and IT networks.

The second year (M2) offers specialized courses that prepare students to the job market. While keeping common core curriculum of courses, it offers two specializations referred as “tracks”: the “imaging” track focuses on the field of audiovisual content processing and transport; the “networks” track focuses on networking technologies and on the design of Internet applications. This Master prepares to research and industry careers. The goal is to provide students with the theoretical grounding and the hands-on command of technologies related to multimedia and IT networks, in order to train not only professionals ready for the audiovisual information processing and transport industry but also scientists ready for a PhD program in these research areas.

Program overview

- The M1 (core curriculum, with 6 ECTS credits of optional classes) is divided into 2 semesters of 30 ECTS credits each;
- The M2 is organized in a “core curriculum-track specialization-internship” sequence:
 - 1st semester: core curriculum (24 ECTS credits) then optional classes (4 ECTS credits) then track specialization classes (6 ECTS credits);
 - 2nd semester: 4 to 6 months internship (research or industry, 30 ECTS credits).

Admission requirements

Students are recruited through the regular admission procedure for Master’s degrees. Admission will be granted depending on the applicant’s educational background, within the constraints of the program’s enrollment goals. If applicable, students may also send an application file for a VAE (Validation des Acquis de l’Expérience, i.e. Work Experience Credit) procedure.

- M1: holders of a Bachelor’s degree (including, but not limited to, those offered by the Université Paris 13) in Engineering sciences, Electronics, Mathematics, IT and Physics/Chemistry.
- M2: admission is not only open to any M1 student from the program, but also to any applicant, French or international, who has achieved an appropriate education level (engineering school, first year of a Master’s degree, etc.)

Career placement

- Jobs: R&D engineer, project manager, research and/or teaching academic appointment (after completion of a PhD program), manufacturing engineer, etc.
- Fields: IT engineering services; technology innovation startups; IT and multimedia providers; other sectors companies that are active in networks and/or multimedia (banks, insurance companies, etc.)
 - the “imaging” track tends to lead to jobs related to multimedia content analysis, processing and transmitting, especially for image and video contents (HDTV, digital cinematography, surveillance video, medical imaging, multimedia security, video games, etc.)
 - the “networks” track tends to lead to jobs with an Internet component (Web applications, mobile communications, virtualization, network security, Internet of Things, etc.)

Further education

- PhD



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SEMESTER 1

Foundational TUs (Teaching Units) (30 ECTS credits)

TU 1

- Fundamentals of mathematics (FM, 5 ECTS credits)

TU 2

- UNIX (3 ECTS credits)

TU 3

- Information theory (TI, 4 ECTS credits)

TU 4

- Java object-oriented programming (POAJ, 4 ECTS credits)

TU 5

- Data transmission networks (RTD, 5 ECTS credits)

TU 6

- Digital Signal processing (TNS, 5 ECTS credits)

TU 7

- General knowledge 1 (CG1, 4 ECTS credits)
 - Communication and Writing Techniques (TEC, 2 ECTS credits)
 - English 1 (2 ECTS credits)

SEMESTER 2

Foundational TUs (20 ECTS credits)

TU 1

- Internet protocol (PI, 5 ECTS credits)

TU 2

- Digital image processing (TIN, 5 ECTS credits)

TU 3

- Computer graphics and virtual reality (ISRV, 5 ECTS credits)

TU 4

- Java for networks and images (JRI, 5 ECTS credits)

Choose among (for 6 ECTS credits):

TU 5

- TU 5.1: Digital Signal Processors (DSP, 2 ECTS credits)
- TU 5.2: Error detection and correction codes (CDCE, 2 ECTS credits)
- TU 5.3: Microwave transmission and satellite connection (FHLS, 2 ECTS credits)
- TU 5.4: Discovery project in imaging or networks (2 ECTS credits)
- TU 5.5: Discovery TU within another Master's program of the Institut Galilée (X ECTS)

TU 6

- Digital signal processing (TNS, 5 ECTS credits)

TU 7

- General knowledge 2 (CG2, 4 ECTS credits)
 - Communication and Writing Techniques (TEC, 2 ECTS credits)
 - English 2 (2 ECTS credits)

For more information

- > Director[s]
- Program director: Ken CHEN (PR) – M1: Anissa MOKRAOUI (PR) – M2 "Imaging" track: Azeddine BEGHADADI (PR) – M2 "Networks" track: Ken CHEN (PR)
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SEMESTER 3

Core curriculum (20 ECTS credits)

TU 1

- General knowledge 3 (CG3, 4 ECTS credits)
 - Innovation or Quality
 - English

TU 2

- Coding and Transmission of Multimedia Contents (CTCM, 5 ECTS)

TU 3

- Web Applications (AW, 4 ECTS credits)

TU 4

- Network security and multimedia content encryption (SRPCA, 5 ECTS credits)

TU 5

- Advanced QoS mechanism (MAQ, 2 ECTS credits)

Choose among (for 4 ECTS credits):

TU 6

- TU 6.1 : Joint source-channel coding (CCSC, 2 ECTS credits)
- TU 6.2: Distributed Internet applications 1 (AIR-1, 2 ECTS credits)
- TU 6.3: Mobile networks (RM, 2 ECTS credits)
- TU 6.4: Digital TV and cinema (TVCN, 2 ECTS credits)
- TU 6.5: Digital communications (CN, 2 ECTS)

"Imaging" track TUs (choose among the following, for 6 ECTS credits)

TU 7

- TU 7.1: Video Processing and analysis (TIV, 2 ECTS)
- TU 7.2: Advanced image processing (TIA, 2 ECTS)
- TU 7.3: 3D Imagery (IMA3D, 2 ECTS credits)
- TU 7.4: Java multimedia (JM, 2 ECTS credits)
- TU 7.5: Audiovisual content indexing (ICAV, 2 ECTS)
- TU 7.6: Visual data mining and learning (AFDV, 2 ECTS credits)

"Networks" track TUs (choose among the following, for 6 ECTS credits)

TU 8

- TU 8.1 : Distributed Internet applications 2 (AIR-2, 2 ECTS credits)
- TU 8.2: Stochastic models for networks (MSR, 2 ECTS credits)
- TU 8.3: Novel paradigms for networking and architecture (NPR, 2 ECTS credits)
- TU 8.4: Emerging networks (REM, 2 ECTS credits)
- TU 8.5: Infrastructure networks (RIF, 2 ECTS)
- TU 8.6: Networks services and management, information models (SGR, 2 ECTS credits)
- TU 8.7: Simulation of networks (SIR, 2 ECTS credits)
- TU 8.8: Virtualization of networks and systems (VIR, 2 ECTS credits)

SEMESTER 4

- Research or industry internship (30 ECTS credits)

