Interaction, Graphics & Design (IGD)

Track of *Master Informatique* of Institut Polytechnique de Paris

English Master's Program

Program is 2 years (M1+M2) but **possibility to enter at M2** (see below)

Oriented: Research and Industry

Fields

- **HUMAN-COMPUTER INTERACTION**
- **AUGMENTED, VIRTUAL & MIXED REALITY**
- **DESIGN**
- **COMPUTER GRAPHICS**
- **MULTIMODALITY, ROBOTICS**

Academic Institutes

- Télécom Paris, Polytechnique, Télécom SudParis, ENSTA

Joining at M2 Level

- For students from one of the previous institutes at M1 level (following basic courses in the chosen field is required if you have not already passed equivalent courses)
- Choose among a wide variety of courses in one or several of these 5 fields
- 5 ECTS research project
- 5 ECTS in other related disciplines
- 30 ECTS 4-6 months internship, in research or industry lab

Contact

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Courses

HUMAN-COMPUTER INTERACTION

- Interactive 2D/Web/Mobile Application Development (2.5 ECTS)
- Human-Computer Interaction (5 ECTS)
- Visualization (2.5 ECTS)
- Gestural and Mobile Interaction (2.5 ECTS)
- Web Development (2.5 ECTS)
- Multiplayer Online Games Development (2.5 ECTS)
- Advanced Programming of Interactive Systems (5 ECTS)

- Fundamentals of Situated Interaction (5 ECTS)
- Evaluation of Interactive Systems (2.5 ECTS)
- Groupware and Collaborative Interaction (2.5 ECTS)

AUGMENTED, VIRTUAL & MIXED REALITY
- Human-Computer Interaction for Mixed Reality (2.5 ECTS)
- Fundamentals of eXtended Reality (2.5 ECTS)
- Advanced Immersive Interactions (2.5 ECTS)
- Mixed Reality and Tangible Interaction (2.5 ECTS)
- Virtual Humans and social interactions (2.5 ECTS)
- Immersion and interaction with virtual worlds (2.5 ECTS)

DESIGN
- User Centered Design 1: introduction (5 ECTS)
- User Centered Design 2: prototyping (5 ECTS)
- Management and design of Innovation (5 ECTS)
- UX Design Sprint (2.5 ECTS)
- Design user experience (2.5 ECTS)
- Data Storytelling for non coders (2.5 ECTS)
- Workshop Research Design + Cognition (2.5 ECTS)

COMPUTER GRAPHICS
- Interactive 3D Application Development (2.5 ECTS)
- Computer Graphics & Virtual Reality (5 ECTS)
- Advanced Computer Graphics (6 ECTS)
- Computer Animation (4 ECTS)
- Image & Computer Vision (4 ECTS)
- Digital representation and analysis of shapes (4 ECTS)
- Image Synthesis (4 ECTS)
- Computational Geometry (4 ECTS)
- Advanced 3D graphics: from creative IA to character motion control (2.5 ECTS)

MULTIMODALITY, ROBOTICS
- Multimodal Dialogue (2.5 ECTS)
- Socio-emotional embodied conversational agents (2.5 ECTS)
- Learning for robotics (2.5 ECTS)
- Soft robots: simulation, fabrication, and control (2.5 ECTS)

PROJECTS & SEMINARS
- HCI/Graphics Project Seminar (2.5 ECTS)
- Research Project in HCI, AR/VR or Graphics (2.5 ECTS)
- Project in Innovation and Design (5 ECTS)
- Research Seminar in Design (2.5 ECTS)

- Research Internship (30 ECTS)

- Programming paradigms: Theory and practice (2.5 ECTS)
- Audio-Visual Transport (2.5 ECTS)

Program overview

The IGD study track is a two-year master's program that aims to provide comprehensive coverage of the Human-Computer Interaction, Computer Graphics, and Design fields. The program is taught in English and prepares students for the design and creation of advanced interactive computing systems. It provides them with fundamental knowledge and practical methods and also presents advanced techniques in these fields.

Students can choose from a wide variety of courses devoted to the above listed topics, as well as courses on augmented/virtual/mixed reality, data visualization, video games or multimodal interaction. Students may study the field in breadth or focus on a specific subdomain of study. The program is highly multidisciplinary and involves collaboration with experts of various fields. It is partly conducted in partnership with Université Paris-Saclay.

Educational objectives

The master's program covers the fundamental aspects of interaction, design, and computer graphics, with an emphasis on multidisciplinary aspects. It provides technical skills and concrete applied methodologies for making user interfaces and interactive 3D applications more creative and more adapted to users' needs. The program aims at enabling students to solve theoretical and applied problems with a great deal of time being devoted to projects, workshops, sprints and practical classes. The program also aims to familiarize students with research and scientific work, and will include a scientific project in the first year and an internship in the second to prepare students for careers in academia and industrial R&D.

Career prospects

This program leads to application fields such as interaction design, computer-aided design, augmented and virtual reality, video games, special effects, visualization, and mobile and web computing. The program will allow students to apply for positions in the industry, especially in research and development labs, and also prepare students for research. Students interested in doing a PhD will benefit from the vast scientific environment within the Institut Polytechnique de Paris and world-renowned research labs in France (Inria, CNRS, CEA, etc.)