

PROGRAM

(30 hrs - 3 ECTS for each course)

- 1/ Mathematical tools for Robotics
- 2/ Modeling of Mechanisms, Machines and Robots
- 3/ Control of robotic systems
- 4/ Multi-sensory perception
- 5/ Learning for robotics
- 6/ Advanced Programming and ROS
- 7/ Artificial vision
- 8/ Driver Assistance System
- 9/ French (common to all SFRI Graduate Tracks)
- 10/ Humanities

CAREER PROSPECTS

The potential jobs for APR Master's students are related to public/private research and to engineering. Related fields include the automotive industry, aeronautics, space, transportation, medical, defence, materials, pharmaceutical industry, food industry, rail transport or chemistry.

Opportunities range from large multinational groups to start-ups, and include keeping with a PhD contract. Here are some examples of PhD theses recently carried out by APR Master's students:

- **Evaluation of deep reinforcement learning methods for robotic exploration**
(ONERA / SIGMA Clermont collaboration)
- **Optimal traversability analysis for the safety of robot displacements**
(Université Laval (CANADA) / INRAE / Institut Pascal collaboration)
- **Contributions to multisensory perception in a disturbed environment through deep learning**
(Institut Pascal / CEREMA collaboration)

ADMISSION CRITERIA

Candidates should have or should be in the process of obtaining a Master 1 degree in the fields of robotics, automatic systems, computer science or signal processing. The selection process will be based on the examination of the application and the candidate may be invited to an interview.



Internships :

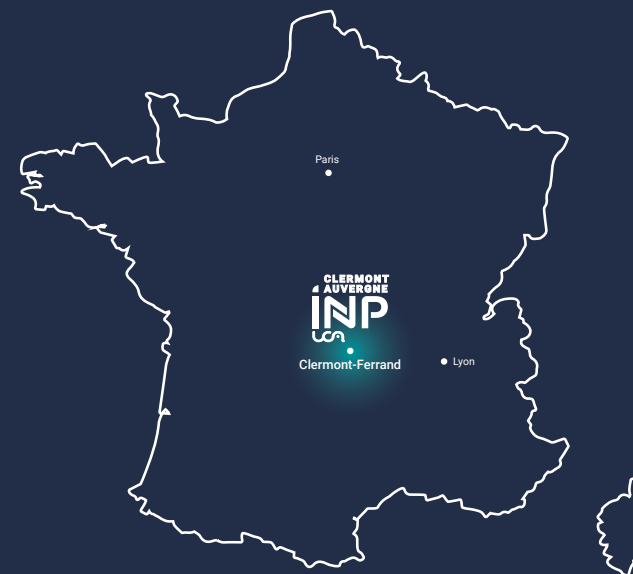
- During 4th semester : starting in March in an academic laboratory or private company in France or abroad.

Industrial and research partners:

- Michelin, Limagrain, Sherpa Engineering, Logiroad, CEA, Thalès.

Research laboratories

- Institut Pascal, INRAE



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ROBOTICS

Graduate Track For Intelligent
& Innovative Mobility



ÉCOLE UNIVERSITAIRE
DE PHYSIQUE ET D'INGÉNIERIE
Université Clermont Auvergne



Institute of Technology
3 graduate schools of Engineering in Clermont-Ferrand
Clermont Auvergne University

Computer science • Biological Engineering • Mechanical Engineering • Civil Engineering
• Electrical Engineering • Mathematical Engineering & Data Science • Engineering Physics
• Production Systems Engineering • Chemistry & Chemical Engineering

3 engineering graduate schools Clermont Auvergne INP - ISIMA Clermont Auvergne INP - SIGMA Clermont Clermont Auvergne INP - Polytech Clermont	4 engineering preparatory classes (undergraduate level) La Prépa des INP (Groupe INP) CPI (Fédération Gay-Lussac) Prép Isima PeiP (réseau Polytech)	2 500 students	189 international cooperation agreements
INP Member of the INP Group +35 public engineering schools in France	1 professional training department	350 academic & administrative staff	3 Main research centers affiliated to the French National Research Centre (CNRS)



EDUCATION



RESEARCH



PROMOTION OF RESEARCH



Université Clermont Auvergne : A major teaching and research university

The new Clermont Auvergne University aims to be a major player in development, a major university of education and research with an international dimension. Strongly connected to its territorial environment and to the socio-economic world, it intends to rank among the best French universities in the Shanghai ranking. In a changing world whose references evolve regularly, a university must prepare its students to participate in the construction of the society in which they will evolve. Designing sustainable models of life and production is the unifying theme that UCA wanted to develop, a theme that is based on university research activities that have reached a level of excellence recognized beyond our borders and that responds to society's expectations (how to eat better, move better, live in good health, how to protect populations from the risks of natural disasters). It is a unifying theme that does not exclude any of the university's disciplinary fields and makes it possible to combine academic training with civic education. Finally, it facilitates the integration of students into the world of tomorrow and into companies that are increasingly attentive to the issue of social responsibility.

A label of excellence

In 2017, UCA received the I-Site label. This makes it one of the few universities selected to implement a long-term policy of excellence, develop interactions with their economic environment and attract internationally renowned research teams. The university is also involved in the organization of summer schools and international conferences.



The School of Physics and Engineering (EUPI) at University of Clermont Auvergne trains Master's students with the aim of combining scientific excellence and a passport to employment. The masters in physics specifically address the world of particles and nanostructures. The spectrum of engineering is broad and covers the fields of energy, electronics, robotics, mechanics and artificial perception. Upstream, the Bachelors best prepare students to integrate a master's degree, whether locally or throughout Europe.

2 teaching departments
Sciences for the engineer
Physics

3 bachelors
Physics
Physics / Chemistry
Sciences for engineers

7 masters
Fundamental Physics and Application
QHS / Integrated Performance Management
Energy
Electromagnetic Compatibility
Automatic Robotic
Mechanical Signal and Image
Processing Nuclear Engineering

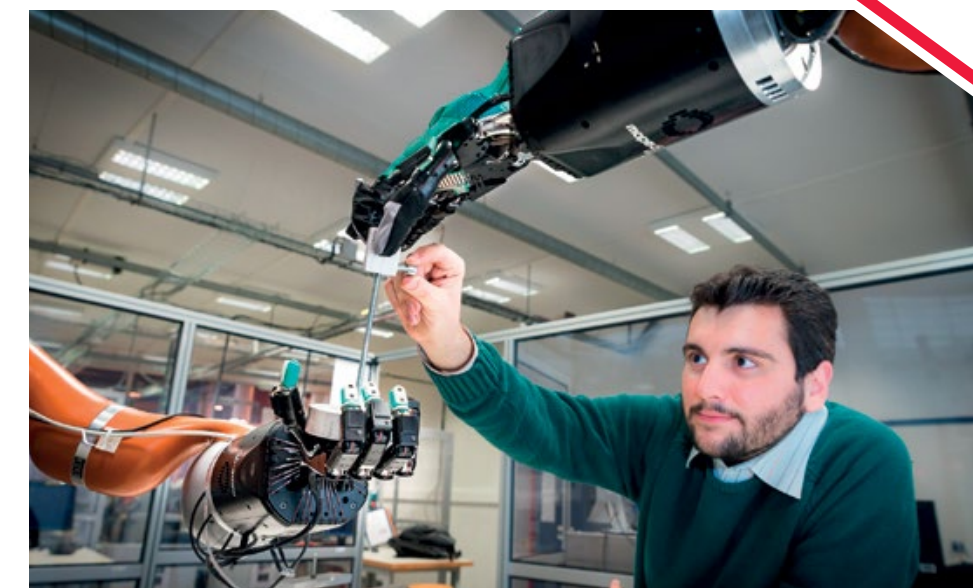
1 000 students

90 academic & administrative staff

3 main research centers affiliated to the French National Research Centre (CNRS)

MASTER'S DEGREE ARTIFICIAL PERCEPTION & ROBOTICS

Robotics is currently one of the most popular topics, and robots have the potential to solve complex challenges in the areas of transportation, factories of the future, agriculture, medical care, production and food supply.



In short:

- > **Course duration:** 2 semesters
- > **Language:** English
- > **Starting in:** September
- > **ECTS:** 60

This master's degree offers students **a multidisciplinary education in the field of artificial perception and robotics**. Students will **learn how to model, design and control a robotic system** in numerous applications, particularly in the specific context of intelligent and autonomous vehicles. This master's degree will improve the employment prospects of students by providing them **with relevant theoretical knowledge and practical skills** to become robotics engineering experts in their field. At the end of their course, students will:

- **Master the scientific foundations of robotics** (mechanics, automatic systems, artificial intelligence...)
- **Apply the mathematical tools** necessary to model robotic systems.
- **Understand, identify and implement the numerical tools** involved in robotics
- **Capitalize on robotics** in order to design complex intelligent systems.

Hosting graduate school:



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