Career Opportunities

Whether you hold a Master's or a PhD degree from the Graduate Programme in Smart Computing, your expertise aligns seamlessly with the needs of companies and laboratories engaged in advanced applications of digital technology. Your skills are particularly relevant in sectors closely tied to digital advancements, where companies manage intricate digital data that requires enhancement.

Examples of employment:

- Employment in industrial R&D service
- Researcher, lecturer (after obtaining a Ph.D.)

More than 90% of master's graduates secure employment in socio-economic sectors within two months of completing their studies. Their salaries are competitive and rank among the highest in university programmes.

Contact
Programme leaders
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FRANCE 2030

DIPLÔME NATIONAL DE MASTER CONTRÔLE PAR L'ÉTAT

DIPLÔME NATIONAL DE DOCTORAT CONTRÔLE PAR L'ÉTAT

ANR-20-SFRI-0014

univ-nantes.fr

LS2N

Nantes Université

CENTRALE NANTES

CENTRE HOSPITALIER UNIVERSITAIRE DE NANTES

cnrs

Inserm
La science pour la santé
From science to health

Smart Computing

Graduate Programme

MASTER'S AND DOCTORAL DEGREES

Nantes Université

Digital Intelligence (Smart Computing) is a multidisciplinary field where advanced computing methods and technologies are combined with engineering approaches to create systems, applications and new services that meet the needs of society. Everything we envision in real society now has its digital twin, enabling greater efficiency, personalization, security and sustainability. For example, smart cities are expected to improve the quality of life of their inhabitants while promoting sustainability, efficiency and economic growth. . Smart electricity grids improve electrical energy distribution and consumption efficiency, reliability, and sustainability. The Master and PhD programme in Smart Computing (GP SMART) trains high-level engineers and researchers capable of working at the frontier of the state of the art of digital technology and pushing its limits. We aim to offer a research-oriented programme where students will be better prepared for their PhD and research careers.

Why Smart Computing?

- Receive **high-level training** to become an R&D engineer or researcher skilled in cutting edge of digital technology
- Benefit from the environment and expertise of an **international laboratory**, academic researchers, and CNRS and INRIA researchers.
- Promote **innovative** solutions in the field of **digital intelligence**.
- Develop **autonomy** through involvement in laboratory research projects.
- Implement **experimental** methodologies on research platforms.
- Acquire **expertise** and **skills** in the field of digital intelligence.
- Benefit from **personalized** supervision and mentoring.
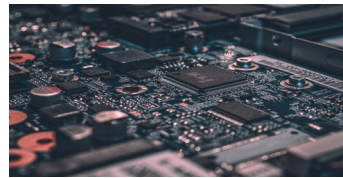
Admission

Academic requirement

Students must have obtained a degree in computer science (software, data, visual, ...) or equivalent.

- **Master's level:** Bac +3, Bac +4 (180 ECTS validated). Recruitment in first and second year of master
- **At PhD level:** Bac +5 (Bac +3 & 120 ECTS validated).

The profile of students must demonstrate excellent skills in computer science.

Language requirement

Students must meet one of the following English language requirements:

- Minimum B1 level or equivalent
- Graduate from a University in an English-speaking country

Our programme

Master - first year

S1
- Graphs et Complexity
- Scientific English
- Development and Operation
  → Mandatory core curriculum of the Master in Computer Science
- **3 Elective courses**
- 2 Elective courses of Smart Computing :
  - Discovery of research: meetings, participation in research events and thesis defenses, interviews with doctoral students.
  - Engineering for research: assistant engineer (understanding the foundations of experiments or research projects in progress) + work to be done.

S2
- Compilation
- Machine learning
- Research project
- Professionnalisation and ethics
  → Choose 2 elective courses from the core curriculum of the Master in Computer Science
- 3 Elective courses of Smart Computing :
  - Discovery of research: active participation in the research project
  - Engineering for research
- Mandatory internship

Master - Second year

S1
- **4 Elective courses**
- 2 Elective courses of Smart Computing
- Master's dissertation

S2
- Supervised research

Elective courses

- Software engineering
- Introduction to non-linear optimisation
- Graphs II and Networks
- Duality and continuous linear optimisation
- Exploratory analysis of differentiable data
- Metaheuristics
- Artificial Intelligence and Applications
- Human-Machine Interaction
- Cross-disciplinary projects
- Competition and verification
- Massive data and the semantic web
- Discrete and combinatorial optimisation

A 1000 euros scholarship will be granted to the best foreign candidates at the Master's level

Doctorate

Research project	Transversal training (Communication, innovation, ethical	Specialized training (disciplinary and personalized)	Up to 45 hours of doctoral training in Smart Computing (working in tandem with a master's degree as a part of its teaching units).

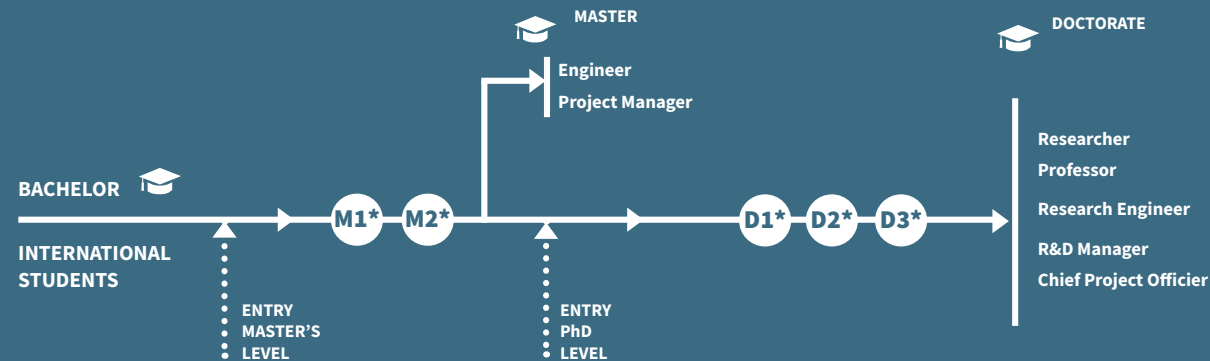| Workshops and seminars	International Mibility	Summer and winter schools

Potential financial support from Nantes University, INRIA, ANR, ERC, CNRS and the Pays de la Loire Region for internship, international mobility and doctoral funding

The Graduate Programme

MASTER

Engineer
Project Manager

DOCTORATE

Researcher
Professor
Research Engineer
R&D Manager
Chief Project Officer

BACHELOR

INTERNATIONAL STUDENTS

M1* — M2* — D1* — D2* — D3*

ENTRY MASTER'S LEVEL

ENTRY PhD LEVEL

*M1 and M2: 1st and 2nd year of Master's; D1, D2 and D3: 1st, 2nd and 3rd year of Doctorate

Skills

Master

- Use advanced **digital tools,** develop and integrate highly specialized knowledge.
- Collect, analyze, model and interpret **data** with **critical analysis**.
- **Integrate** professionally, especially in **international** context.
- Communicate in French or English, both written and spoken, with proficiency in **technical vocabulary**.

Doctorate

- Develop **expertise** by carrying out an innovative project within a research team in a promising field.
- Deepen the **specialized knowledge**.
- Acquire skills in the use of **analysis** techniques and tools.
- Develop **teaching** and **project management** skills.