CentraleSupélec | université PARIS-SACLAY

MScAI
Master of Science in Artificial Intelligence
Applied to society

Master of Science in **Artificial Intelligence**

Applied to Society

Edito

Artificial intelligence has become increasingly prevalent in our lives and is a definite game changer for society. This program aims to provide students with the foundations and most advanced techniques in the field, enabling them to become technical leaders of this transformation. Our program offers a unique curriculum, tackling the field with model / symbolic-driven and data-driven artificial intelligence methods, assessing their applications to key societal domains such as sustainable development, new mobilities, networks, Industry 4.0, and health / wellbeing. This unique program, offering an end-to-end approach from theory to practice, is delivered entirely in English by outstanding academics and professionals, and offers an excellent curriculum to those preparing for a future as Artificial Intelligence architects seeking exceptional career perspectives in the hottest discipline of the 21st century.

Vincent Mousseau
Academic Co-Director
Faculty Member at the Mathematics and IT Laboratory for Complex Systems (MICS), studying preference modelling and decision systems.

Applied to society

SUSTAINABLE ENERGY

Renewable energy plays a huge part in the building of a better future, and Artificial Intelligence is a fundamental building block of the clean energy transition: contributing to the improvement and acceleration of the energy industry; improving our ability to understand and forecast energy demand; managing network infrastructures; sustainably managing natural resources in a way that is balanced.
We face a further challenge as we strive to make AI energy efficient, by optimizing AI architectures to balance efficiency and energy consumption.
Become a part of Energy Transition through AI, and join the Energy track in the Msc AI!

TRANSPORTATION / MOBILITY

Transportation accounts for a large part of energy consumption. Private cars are a major source of pollution. Transitioning to new forms of shared / sustainable mobility poses a huge challenge. Artificial intelligence has a major contribution to make in the mobility revolution, particularly the multimodal urban mobility of the future.
Crucial areas include designing resilient public transport networks, addressing road safety for autonomous vehicles, predicting traffic flows to minimize congestion, AI for transport operations planning / regulation and asset management.

Join us as we apply Artificial Intelligence to designing new forms of mobility for tomorrow.

HEALTHCARE / BIOMEDICAL

Artificial intelligence is a powerful lever for improving medicine and healthcare. The benefits of Artificial Intelligence in medicine and health are everywhere to be seen: improved pathology detection and diagnosis; personalized medicine; informed patient care; better organized healthcare systems.
AI technologies and methods have already been proven successful in a variety of health applications and the potential to progress yet further is enormous.

In this sector more than in others, AI designers are faced with ethical questions concerning respect for private data.

If you are interested in using AI to build a more efficient healthcare sector that shows respect for the patient, come and join the MSc AI health track.

INDUSTRY OF THE FUTURE

Digital, physical and virtual worlds generate huge shifts in industry. Artificial intelligence is central to this revolution. Typical examples of how AI contributes to industry transformation include predictive maintenance, digital twins and robotics.

The industrial systems of the future will involve a form of collaboration between human operators and software agents in which the two work together (man-machine teaming). The challenges of this field of application require trustworthy, safe, robust and explainable AI in order to design industrial systems of the future that are driven by humans.

Join our program if you want to be a part of inventing and designing the industry of tomorrow

About us

Paris-Saclay University is ranked 16th worldwide and N°1 European Institution in the 2022 Shanghai World Ranking

CentraleSupélec, which is part of the renowned Paris-Saclay research university, occupies an important position within the Engineering and Systems Sciences Graduate School. Artificial Intelligence is central to academic courses at the Graduate School, as well as in the research labs.

université PARIS-SACLAY

ACADEMIC RANKING OF WORLD UNIVERSITIES SINCE 2003

Ranked **16th** worldwide in the 2022 Shanghai World Ranking

275 laboratories

48,000 students

12,000 MSc students

4,600 PhD students

CentraleSupélec

A 21ST CENTURY UNIVERSITY

Our world today is undergoing unprecedented changes. The digital revolution, massive data and globalization are real revolutions that raise huge challenges and expectations for society.

Businesses are looking for high-level scientific professionals who are true "integrator-innovators", able to pool wide fields of expertise, generate new solutions, initiate and bring about change with a strong sense of ethics, responsibility and civic engagement, particularly in the face of social and environmental concerns.

Among the best ranked institutions BY EMPLOYER REPUTATION: 7TH WORLDWIDE, 1ST IN FRANCE (QS World University Ranking 2021)**: 8 out of 10 of our students find a job before graduating and 99% upon graduation**

Today, CentraleSupélec has all the assets to meet the needs of 21st century companies and businesses:

- training multidisciplinary entrepreneurial engineers and experts in complex systems;
- developing innovative responses to major technological, economic, social and environmental challenges through research;
- enabling working professionals to acquire the skills they need to adapt to change and make their companies more competitive.

CentraleSupélec develops its academic excellence and research through robust and fruitful cooperation with major national organizations such as CNRS, CEA, INRIA, INSERM and ONERA.

The School is a founding member of the University of Paris-Saclay, the T.I.M.E. network, the Alliance 4Tech, a strategic partner of the ESSEC Business School and president of the Écoles Centrale Group.

4,500 students and 370 teachers and faculty members, 20% of whom are international
600 students in 18 laboratories and research teams
3 schools abroad (China, India and Morocco) and 4 associated international laboratories (Brazil, Canada, United States and China)
176 foreign partner universities
140 partner companies in the engineering curriculum, including 30 SMEs
45,000 active graduates around the world and in all sectors

A leading, internationally recognized institution
China, United States, Singapore and Canada India Morocco

CentraleSupélec coordinates the Engineering and Systems Sciences Graduate School
In preparation for the world of tomorrow, it seek a balance between the ecological and economic development of our societies by conducting research at the highest global level. Increased international recognition of the excellence of French engineering qualifications will allow the Graduate School to attract top students to its various programs.

CENTRALESUPÉLEC: A significant player in Data Science and Artificial Intelligence

75
Professors and Researchers, and 150 doctoral students

7
Laboratories are involved across our three campuses: Paris-Saclay, Metz and Rennes

4
Research and teaching chairs in Data Science and Artificial Intelligence.

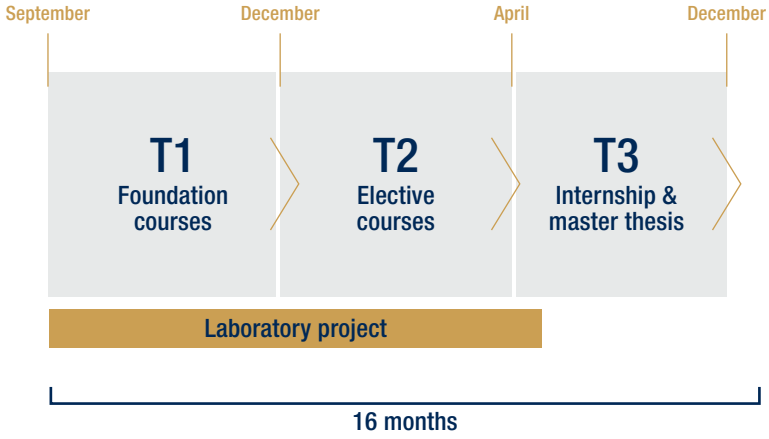
MANY
business partners

accenture, Beijaflore, EDF, ForePaaS, ILLUIN TECHNOLOGY, KLEE GROUP, OCTO Technology Accenture Digital, onepoint. beyond the obvious, PADOK, QRT, Renault Group, SAFRAN, SOCIETE GENERALE, SOLYSTIC, sopra steria, THALES

INSTITUTE DATAIA Data Science, Intelligence & Society

CentraleSupélec, founding member of the DATAIA Institute
CentraleSupélec is a very active, founding member of the DATAIA Institute, the first convergence institute in France specializing in Data Sciences, Artificial Intelligence and Society.

Program calendar



Céline Hudelot
Academic Co-Director
Professor and Head of the Mathematics and IT laboratory for Complex Systems (MICS).
She also heads the Randstad chair.

"We are pleased to be able to welcome international students to a rich educational program and a stimulating environment in which they can flourish and progress. Artificial Intelligence (AI) is a science and a set of computational technologies that aim to solve complex problems involving a kind of intelligence. The field of Artificial Intelligence is relatively young (1956) but spectacular advances have already been made, with significant impacts on society, and more to come. If you want to participate in the construction of the future enriched by responsible AI, nothing could be easier, just join our program"

Dave Jacob
Program Manager

"You're going to want to join us! Operating in an international environment, you will benefit from CentraleSupelec's AI ecosystem that includes the AI Hub, our labs and of course the relationships you will develop with prominent partners. Year round, you will have the opportunity to participate in a variety of AI events, such as fairs and presentations.
The world is changing and it starts with us."

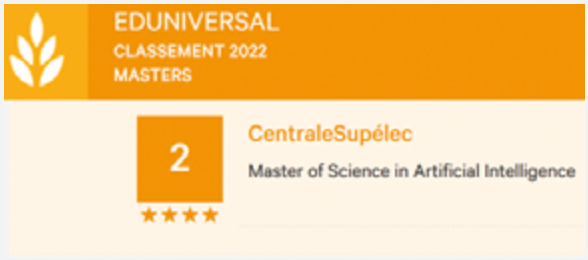
Program

Foundation Courses

Foundations of Machine Learning
Foundations of AI
Foundations of Decision modeling
Foundations of Optimization
Foundations of Deep Learning
Big Data for AI
AI and Ethics
Stochastic optimization

Elective Courses

Reinforcement learning
Game Theory
Graphical Models
Multi-agent Systems
Advanced Statistics
Advanced Deep Learning
Ensemble Learning
Computer Vision
Natural language processing
Internet of People
Explainable AI
Medical Imaging
Computational Social Choice
Predictive maintenance
AI Planning



2nd best MSc in AI in France, Eduniversal 2022

Lab project

(October to March)

Students, working in pairs, select a research topic tutored by a professor or researcher in an associated laboratory. The topic corresponds to a state-of-the-art problem. Students are asked to assess the existing literature, propose an algorithmic solution to the problem at hand, implement it, and provide a numerical validation.

Internship & Master Thesis

To complete the CentraleSuplec MSc in Artificial Intelligence, students must acquire professional experience (by means of a 4-6 month internship or a job in a position related to the program) and complete the related Master's Thesis. This corresponds to a natural extension of the course work carried out during the academic year.

ENERGY
JEAN LOUBET

"For my internship, I joined Kayrros where we provide clients with climate data to reduce greenhouse gas emissions, and manage the energy transition. We leverage advanced algorithms, satellite imagery and other data to empower global climate governance. I am part of the WildFire team working on wildfire prevention, optimizing risk profiling and automate damage assessment. The MSc AI gave me a solid base in Machine Learning, data analysis and Deep Learning which has served me well in my work."

PREDICTIVE MAINTENANCE
ZHIGUO ZHENG

"Data-driven approaches for predictive maintenance planning is a hot AI application topic. I am coaching a lab project in the MSc AI on predictive maintenance planning by fusing physics-based and deep learning models. Monitoring signals of degradation processes are used to predict the remaining useful life of the system, and preventive maintenance decisions are made based on the predicted remaining useful life."

MOBILITY TRANSPORT
MÉGANE FILLION

"During my MSc AI internship, I've been working as a computer vision engineer for LIXO: a green tech start-up that analyses in real time the composition of the waste streams collected. I've been tasked with implementing advanced data augmentation techniques along with an instance segmentation pipeline in order to improve the efficiency of their current solution. I've found that the internship is a vital part of the Msc AI's curriculum seeing as there is so much practical knowledge to be acquired from a corporate setting."

HEALTH AND MEDECINE
FABIEN GIRKA

"The Master of Science in AI prepared me for my first research experience with an internship at the Paris Brain Institute (ICM) for automatic segmentation of brain MRI images. This first research experience convinced me to continue on with a PhD in the field. So I started a PhD at CentraleSupélec and the ICM with application to multiple sclerosis diagnosis, which combines advances in AI methods and actual impact on the application level."

WHO CAN APPLY?

· Recent graduates or soon-to-be graduates from top universities/schools with good degrees (Bachelor/Master1) Engineering, Mathematics, Statistics, Informatics, Physics …;
· … with little to no work experience …
· … a good level of English, and looking to study entirely in English …
· … and aiming to become an expert and leader in AI.

ADMISSIONS

Online Application deadlines:
· Round 1: Nov 28th, 2022
· Round 2: Jan 23rd, 2023
· Round 3: March 13th, 2023
· Round 4: May 8rd, 2023
· Round 5: June 12nd, 2023
· Round 6: July 3rd, 2023

FINANCING

Tuition fees: €20,000 including €2,000 deposit. The deposit is payable upon acceptance into the program and before registration. This amount is later deducted from your tuition fees. Your remaining tuition fees can be paid each year in 2 equal instalments in August & October.

APPLICATION

For any questions, or to request further information, please contact:
msc-ai@centralesupelec.fr
https://apply.centralesupelec.fr/mscai

"Ethical AI as a force for good in society."

"As a French person, I was well aware of the reputation of CentraleSupelec. It is one of the best schools in France. In addition, the description of the course interested me a lot: Most schools that have AI programs are focused on Machine and Deep Learning but AI is not only about that. There are plenty of issues that exist in AI that Deep Learning would not solve. I would describe the MSc AI of CentraleSupélec as:

- Demanding: the program is short and intense
- Gobal: we study a lot of different fields in depth
- Balanced: we did both research opportunities and application.

"

LOUIS DE VITRY
Co-founder of Kanop

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ACADEMIC TEAM

Academic Co-Directors

Céline Hudelot, Vincent Mousseau

Program Manager

Dave Jacob

MORE INFORMATION

For any questions / further information,
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www.youtube.com/channel/UC-b_Xc3XZfqOX1P41XErV-w

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