UNIVERSITÀ
DEGLI STUDI
DI MILANO

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DI PAVIA

Master's degree programme in

Human-centered Artificial Intelligence

The Universities of Milan, University of Milano-Bicocca and University of Pavia offer a joint Master's Degree in Human-Centered Artificial Intelligence, with a highly innovative and international character, delivered entirely in English.

Objectives

The overall goal of this master's degree program is to offer a signficantly interdisciplinary context to train new professionals capable of accompanying the widespread diffusion of Artificial Intelligence in the professional world, enabling the reasonable and responsible integration of new technologies into the human context in which they are to be used. The aim is to train bridging figures between the hard-skills of experienced developers and the soft-skills needed to integrate AI applications into the human context in which they are deployed.

The course is aimed at highly motivated graduates from both STEM and Humanities, Neuroscience and Law areas, with a good aptitude for interdisciplinary studies, as well as professionals and employees of public or private companies, who want to update their skills in the face of the growing demand for innovation.

Starting from a broad common core of essential disciplines, the course will be divided into three curricula. The three curricula aim to provide a more specific preparation in relation to three main contexts:

A) Curriculum Hybrid AI, for a more in-depth study of the context of cooperation between humans and machines in hybrid work teams;
B) Curriculum Neuro AI, for a more in-depth study of the context of clinical and theoretical neurosciences;
C) Curriculum AI & Law, for a more in-depth study of the context of applications in the legal field.

Career prospects

Expert in Human-AI Cooperation

Function in a business context:

- Coordinating hybrid work teams (consisting of humans with different skills and machines), fostering interaction between IT experts, managers, domain experts, UX- designers and stakeholders.
- Organising the division of tasks and the cooperation between humans and machines, taking into account psychological, ethical, sociological and cultural aspects.
- Translate stakeholders' needs in order to elaborate appropriate AI-based development projects within an organisation or company.
- Propose coaching and training sessions for employees to illustrate the benefits of human-machine hybrid teams.
- Coordinate collaboration with external consultants (economists, sociologists, analysts).
- Propose new performance indicators to assess the effectiveness of hybrid teams.
- Properly assess the ethical, psychological and social aspects of introducing artificial intelligence into the work environment and the general social context.

Employment outlets:

The master's graduate will be able to find employment as an AI contact person in small and medium-sized companies, in enter-

prises and corporate groups, including those with a transnational dimension, in public administrations, independent authorities and national, EU and international agencies. He or she may also serve as a freelance consultant and as a researcher in public and private enterprises.

Expert in Neuro-AI

Function in a work setting:

- use virtual models of the brain to advance the diagnostic and therapeutic/rehabilitation pathway in the direction of precision and personalized medicine in clinical neurology;
- develop and manage AI systems to retrieve/extract/integrate clinical information acquired from different sources
- interface the clinical setting with new AI-based ICT technologies;
- oversee the training activities of healthcare personnel by fostering the growth and dissemination of an "AI culture."
- adequately evaluate the ethical, psychological, and social aspects related to the introduction of artificial intelligence in the health and social context.

Employment outlets:

Clinical facilities, both public and private, neuroscience centers, R&D departments developing digital and technological platforms for personalized and precision medicine, ICT departments in the biomedical field.

Expert in AI and Law

Function in a business context:

- apply AI techniques within the relevant legal framework of public agencies, private organizations, or international organizations;
- advise policy-making bodies and IT practitioners on the protection of rights in data collection and analysis operations and algorithmic decision-making processes;
- oversee the conscious use of AI by users or any civil and criminal liability profiles (for the user or the organization) arising from the use of innovative instrumentation;
- perform discrimination prevention and data protection oversight functions;
- oversee staff training activities by fostering the growth and dissemination of an "AI culture."

Employment outlets:

Corporations and corporate groups, including those of transnational dimension; public administrations; independent authorities and national, EU and international agencies; self-employed.

Applications and admissions

Open, subject to entry requirements.

Admission requirements

The course has no entry test. Admission is subject to verification of possession of the curricular requirements and evaluation of the candidate's personal preparation and suitability for an interdisciplinary study, to be verified through an interview. An English language proficiency level of B2 or higher is required.

For admission a minimum of 30 ECTS are required in a variety of discipline including Mathematics and Computer Science, Philosophy and Psychology, Biology and Law.

For candidates with foreign degrees, verification of the requirements will be carried out by comparing the contents of the candidates' previous courses of studies.
All details are available at https://hcai.cdl.unimi.it/en/enrolment

Degree syllabus

The Programme offers a unique combination of disciplines associated with foundational and applied areas in AI. Ad hoc tutoring services are offered to compensate for the natural difficulties associated with such a challenging expertise required by the AI specialists of the near future.

Curriculum: Hybrid AI

I year

COMPULSORY LEARNING ACTIVITIES	ECTS
AI and human decision-making	12
AI, ethics and law	6
Brain and cognition	6
Machine learning	6
Mathematics for AI	6
Workshop: Programming Lab	3
An exam to choose among: - Knowledge Representation and Reasoning - Natural language processing - Programming	6
An exam to choose among: - Logics for AI - Methodology of data-driven reasoning - Philosophy of cognitive neuroscience	6
An exam to choose among: - AI and organizational development - Principles of social psychology for AI design	6
3 ECTS for Italian Language (only students without an Italian degree)	3
3 ECTS in a second EU foreign Language for Italian students only (lingua francese, lingua spagnola, lingua tedesca)	3

II year

COMPULSORY LEARNING ACTIVITIES	ECTS
A workshop to choose between: - Software tools for machine learning - Software tools for statistics	3
An exam to choose among: - AI in education - Media theory and AI - Technological transfer	6
An exam to choose among: - Affective computing - Human-computer interaction - Knowledge Representation and Reasoning - Natural language processing - Text and argument mining	6
An exam to choose among: - Anthropology of AI - Smart contracts and intellectual property law - Sociology of AI	6
A workshop to choose between: - Data visualization - Team management	3
3 ECTS for a stage	3
12 ECTS to be earned through any of the elective courses among those offered by the University of Milan, or University of Milano-Bicocca or University of Pavia.	12
Final exam	21

Curriculum: AI and Law

I year

COMPULSORY LEARNING ACTIVITIES	ECTS
AI and human decision-making	12
AI and media law	6
AI, ethics and law	6
Brain and cognition	6
Data protection, law and AI	6
Machine learning	6
Workshop: Programming Lab	3
An exam to choose among: - Knowledge Representation and Reasoning - Natural language processing - Programming	6
An exam to choose among: - Logics for AI - Methodology of data-driven reasoning - Philosophy of cognitive neuroscience	6
3 ECTS for Italian Language (only students without an Italian degree)	3
3 ECTS in a second EU foreign Language for Italian students only (lingua francese, lingua spagnola, lingua tedesca)	3

II year

COMPULSORY LEARNING ACTIVITIES	ECTS
An exam to choose among: - Corporate governance and AI - Responsibility and AI - Sources of law and fundamental rights in AI	6
An exam to choose among: - Data analysis and tax compliance - Digital surveillance, employee monitoring and selection by AI - Justice by algorithm	6
An exam to choose among: - AI and public administration - Banking and insurance law - Multilevel protection of rights in AI - Smart contracts and intellectual property law	6
A workshop to choose between: - Employee monitoring and recruitment - Forensics - Tax data analysis and tax risk	3
A workshop to choose between: - Software tools for machine learning - Software tools for statistics	3
3 ECTS for a stage	3
12 ECTS to be earned through any of the elective courses among those offered by the University of Milan, or University of Milano-Bicocca or University of Pavia.	12
Final exam	21

Curriculum: NEURO AI

I year

COMPULSORY LEARNING ACTIVITIES	ECTS
AI and human decision-making	12
AI, ethics and law	6
Brain Modelling for Biomedicine and Ict	6
Brain and cognition	6
Machine learning	6
Neurophysiology and biophysics for AI	6
An exam to choose among: - Knowledge Representation and Reasoning - Natural language processing - Programming	6
An exam to choose among: - Logics for AI - Methodology of data-driven reasoning - Philosophy of cognitive neuroscience	6
3 ECTS for Italian Language (only students without an Italian degree)	3
3 ECTS in a second EU foreign Language for Italian students only (lingua francese, lingua spagnola, lingua tedesca)	3

II year

COMPULSORY LEARNING ACTIVITIES	ECTS
AI applied to neuroimaging	6
AI applied to neurological sciences and brain-computer interfaces	6
An exam to choose among: - Human-computer interaction - Machine learning for collaborative intelligent systems - Neuromorphic computing for AI solutions and neuro-robotics	6
A workshop to choose between: - Software tools for machine learning - Software tools for statistics	3
A workshop to choose between: - Neuromorphic and neurorobotics - Neuroplasticity and non-invasive brain stimulation techniques	3
3 ECTS for a stage	3
12 ECTS to be earned through any of the elective courses among those offered by the University of Milan, or University of Milano-Bicocca or University of Pavia.	12
Final exam	21

INFO

Disciplinary classification: Cognitive Sciences (LM-55 R)

Duration: 2 years (120 ECTS)

Curriculum:
- Hybrid AI
- AI and Law
- Neuro AI

Attendance: Strongly recommended. Laboratory and internship activities are mainly conducted in presence, and any other form of participation must be agreed with the lecturers or supervisors.

Locations:
University of Milan, University of Milan Bicocca, University of Pavia

Website:
https://hcai.cdl.unimi.it

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For other information: www.unimi.it - Education