



**POSITION TITLE :** “ Planning and distributed decision for complex systems ”

**DISCIPLINE :** Computer Science - Artificial Intelligence

**AFFILIATION :** Ecole Nationale Supérieure Mines-Télécom Lille Douai (IMT Nord Europe)

Public establishment belonging to IMT (Institut Mines-Télécom), placed under the supervision of the Ministry of Economy, Finance and Recovery, IMT Nord Europe has three main objectives: providing our students with ethically responsible engineering practices enabling them to solve 21st century issues, carrying out our R&D activities leading to outstanding innovations and supporting territorial development through innovation and entrepreneurship. It aims at training engineers and scientists of the future, with both industrial expertise and strong skills in digital technologies. Strategically located at the crossroad of Europe, one hour from Paris, one hour and a half from London and thirty minutes from Brussels, IMT Nord Europe intends to become a major player in industrial, digital and environmental transformations of the 21st century. Therefore, our school is building bridges between education, research, engineering and digital science.

Located on two main campuses dedicated to research and education in Douai and Lille, IMT Nord Europe offers research facilities of almost 20,000m<sup>2</sup> in the following areas:

- Digital Systems
- Energy Environment
- Process and Materials

IMT Nord Europe aims at strengthening its Innovation and Research Center (CERI) on Digital Sciences both in education and research but also at developing cross-cutting research activities with other Innovation and Research Centers (CERI) of our school. The goal of our center is to study the fusion of physical and digital worlds using modeling and optimization of complex systems, fluidity in human-environment interactions, and pervasive and secure systems design.

The selection committee will pay specific attention to cross-cutting proposals allowing the connection between the different Centers. For more information, see: [www.imt-nord-europe.fr](http://www.imt-nord-europe.fr)

The required missions of the successful lecturer / assistant professor position candidate are described below

**BRIEF:**

Under the guidance of the Head of Digital Systems Center, the successful candidate will actively contribute to the teaching and research efforts of the Centre.

**Teaching Missions and responsibilities:**

Digital Systems Center is involved in all of the teaching programs of the school. In particular, the CERI is in charge of two teaching areas (Industry and Services, and Digital Systems) in the general engineering training program and a continuous training program in Telecommunications and IA. Digital Systems Center also offers a Master's degree in Cyber Security, certified by ANSSI-SecNumEDU. Finally, the CERI also has teaching activities in professional training, particularly in AI, through the program dedicated to AI Project Manager.

- Contribute to the training courses (courses, Tutorials, Practical Works) in the different curriculum of the school Engineers in his area of specialty (Artificial Intelligence, Data science, robotics). The lecturer also has to participate in common core courses (algorithm and programming, database, ...). Some lectures can be given in English,

- Implement innovative educational methods to replace or complement classroom lectures,
- Involvement in pedagogical support activities (projects, internships, competitive exam).

### **Research and technology-transfer Missions:**

The digital Center is structured in 3 research groups.

ARTS (Autonomous, Resilient Systems) aims at making distributed and constrained systems resilient and autonomous. A global vision is adopted, integrating data collection (and its communication problems), software development (and its adaptation to systems), prediction, control and security.

HIDE (Human, Interaction, DEcision) studies human-centred learning models and the interaction between humans and their environment. It is concerned with augmented environments (Smart Factory, intelligent transport system, ...), or assistance and management of elder's autonomy (technology enabled care, abnormal human behavior).

MCLEOD (Modelling and control of Complex systems in Large Environments requiring Optimized Decisions) aims at understanding and better controlling complex systems through modeling, decision-making and control based on Control theory and Artificial Intelligence approaches.

The candidate will reinforce the MCLEOD axis on the topic of distributed planning and decision-making for complex systems. By complex systems, we mean a system whose high number of interacting elements and/or the richness of possible interactions do not allow a complete enumeration of all the possible evolution of the studied system. Our modeling of a complex system relies on an agent-based approach and for this position, we are interested in the decision process used by the agents. This process potentially integrates the learning from particular perception of the environment; the inference and planning of its behavior in respect of action capacities; the way to coordinate with neighbors to reach their common goals.

### **The assistant-professor will have to :**

- Participate to research activities in the MCLEOD group developing new approaches in planning and distributed decision for complex systems,
- initiate and develop research projects and actions by ensuring the creation of research bridges within the CERI and with other CERIs in relation to the fields of excellence of the school and the Mines Télécom Institute,
- develop research and technology transfer actions with economic partners,
- co-supervise PhD students and prepare the French diploma "Habilitation à Diriger des Recherches (HDR)",
- contribute to the scientific intelligence efforts,
- promote the center's research themes,
- participate in the activities of regional and/or international scientific groups, and organize scientific events,
- participate in the organization of scientific events, and valorize the scientific results obtained (publications, communications).

### **REQUIRED PROFILE :**

The applicant should :

- have solid scientific and technological background to address the control of complex systems through AI approaches: multi-agent systems, planning and stochastic planning, Markov decision process, reinforcement learning, machine learning and data driven modeling (skills on the integration of AI techniques for the control of real systems would be appreciated)

- show interest for one or more of the application fields targeted to the distributed and complex systems: Smart cities (transportation systems and building), Renewable energy and natural resources (monitoring of environmental systems: air / water), Industry 4.0,
- have skills for team working and interpersonal communication,
- be successfully experienced in teaching activities,
- master English language in written and oral forms (whatever the context: expression, negotiation, articles redaction),
- express cultural and linguistic skills and mobilize them to the development of international academic and scientific collaborations,
- actively contribute to the teaching activities and design MOOCs/SPOC in English,
- participate to work teams, international events and exchanges (conferences, congresses, etc.),

The candidate must hold a PhD degree in the field of Computer science and Artificial Intelligence.

This position would fit to an applicant interested in teaching and research activities focused on industrial and societal challenges. A successful experience in a postdoctoral position and knowledge in project management would be greatly appreciated. The candidate should be open-minded to easily and efficiently integrate into multi-disciplinary projects.

The applicant should provide concrete elements justifying the successful practice of teaching activities (qualification, courses, etc.).

This position is in Douai. The applicant should keep in mind the possible short travels required to reach the different sites of activities, especially for teaching activities.

#### **GENERAL INFORMATION :**

The required document and for applying for this position can be obtained by contacting **Human Resources Department** ([serviceconcoursdrh@imt-lille-douai.fr](mailto:serviceconcoursdrh@imt-lille-douai.fr) - Tél : +33 (0)3.27.71.25.36) :

*École Nationale Supérieure Mines-Télécom Nord Europe (IMT Nord Europe) - Direction des Ressources Humaines  
Site de Douai - 941, rue Charles Bourseul - CS 10838 - 59508 DOUAI Cedex - France*

Date of opening of the applications : 18/03/2022

Deadline date for submissions : 06/05/2022

Eligibility Conditions : European Nationality Holders (European Union) at the candidature submission date and possessed of a PhD degree.

#### **FOR MORE INFORMATION ABOUT THE MISSIONS, CONTACT :**

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Please click on this link to get all details regarding the application to this position :  
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