



Grenoble INP - UGA is a member of international engineering and management education and research networks. It is widely recognized in national and international rankings.



8 schools + 39 laboratories

8300 students

1 300 teaching, research, administrative and technical staff

Grenoble INP - UGA is a renowned public institution of higher education and research, and a major player in the Grenoble ecosystem. It is the engineering and management institute of Grenoble Alpes University, and plays a leading role in the scientific and industrial community.

Doctoral Thesis in Sustainable Manufacturing and Artificial Intelligence

Job reference number	
Research field	Industrial Engineering, Computer Science, Artificial Intelligence
Host laboratory	G-SCOP Laboratory (UMR 5272 Grenoble-INP, UGA et CNRS) / Website : https://g-scop.grenoble-inp.fr/
Researcher profile	PhD Student
Location	Grenoble, France (G-SCOP Laboratory)
Date of recruitment / contract length	01/10/2024 (36 months)
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Grenoble INP - UGA is a leading public institution accredited with the French label "Initiative d'excellence". It offers innovative engineering and management programs, with an increasing internationalization of its course offers. The courses are grounded in sound scientific knowledge and linked to digital, industrial, organizational, environmental and energy transitions. The Engineering and Management Institute of Grenoble Alpes brings together more than 1300 staff members (teacher-researchers, lecturers, administrative and technical staff) and 8300 students, located on 8 sites (Grenoble INP - Ense3, Grenoble INP - Ensimag, Grenoble INP - Esisar, Grenoble INP - Génie industriel GI, Grenoble INP - Pagora, Grenoble INP - Phelma, Polytech Grenoble, Grenoble IAE and the INP Prepa). Grenoble INP is also a highly-ranked institution of higher education and research, leading the way in the fields of engineering and management on an international scale. It is a member of a large number of international academic and research networks. It is part of the European University UNITE!.

As part of Grenoble Alpes University, Grenoble INP has associated guardianship of 39 national and international research laboratories and of technological platforms. The research conducted their benefits both its socio-economic partners and its students. Grenoble INP is at the heart of the following scientific fields: physics, energy, mechanics and materials; digital; micronanoelectronics, embedded systems; industry of the future, production systems, environment; management and business sciences.

Grenoble INP - UGA is an equal opportunity employer committed to sustainability. Grenoble INP-UGA celebrates diversity and equity and is committed to creating an inclusive environment for all employees. All qualified applications will be considered without discrimination of any kind.

Research

G-SCOP Laboratory (UMR 5272) is a multi-disciplinary laboratory to meet the scientific challenges induced by current and future changes in the industrial world. The scope of the laboratory ranges from product design to the management of production systems, relying on strong skills in optimisation. It also has new skills in advanced Industry 4.0 technologies and applied artificial intelligence. G-SCOP is a reference laboratory in France in the field of production systems. It is also internationally recognized, via its research networks (CIRP, Design society...) and its research projects in connection with Industry 4.0 and industrial renewal at the European scale. Note that G-SCOP is the carrier of the IDEX Cross Disciplinary Project CIRCULAR 1 (2018-2021), followed by CIRCULAR 2 (2022-2025), a precursor on environmental issues, and has many industrial partnerships that allow G-SCOP members to have a good knowledge of the industrial network and the associated issues.

Doctoral Thesis Offer description: Hybrid Artificial Intelligence (HAI) for Decarbonization Decision Making

This PhD program is part of a larger project entitled "DCarbo" which aims to develop a new approach and innovative tools in order to support the decarbonization of industries. It focuses on industrial processes in discrete manufacturing systems.

Decarbonizing industries requires better knowledge and control of CO₂eq emissions from manufacturing systems. The installation of sensors at strategic locations and the provision of process data in real time could provide the relevant information needed to perform a dynamic analysis of CO₂eq emissions, with better accuracy than current asynchronous approaches. **The challenge here is to define, for several types of manufacturing systems, a generic approach for the acquisition and collection of relevant data as well as the associated tools for decarbonization decision-making. We are particularly interested in developing tools based on Hybrid Artificial Intelligence (HAI), coupling symbolic AI and machine learning.**

Considering real industrial processes, the main objective of this PhD program is (i) to define and characterize realistic use cases that will serve to develop and experiment the decision support tools, (ii) to develop and experiment the HAI-based tools for decarbonization decision-making.

Two industrial cases have already been identified. One concerns an integrated production line that produces bearings for automotive industry. The other concerns a production system that produces equipment for outdoor playgrounds, multi-sports areas and fitness centres.

Specific requirements or conditions

Prerequisites:

- Knowledge of industrial engineering principles and tools and an interest in manufacturing processes are essential.
- A good communication skill and the ability to analyze and synthesize information are required.
- Knowledge and skills in statistics, data analysis, knowledge representation and programming are also required.
- The willingness and ability to learn and apply machine learning algorithms and knowledge reasoning mechanisms are necessary.

Position assigned to a restricted area: NO

(Device for the protection of the scientific and technical potential of the nation, conditioning the appointment of the researcher to the authorization of the Defense Security Officer).

How to apply

Applications must be sent to : abdourahim.sylla@grenoble-inp.fr ; maria.di-mascolo@grenoble-inp.fr

Application deadline : **15/06/2024**