Internship offer at G-SCOP Laboratory

Industrial Engineering and Artificial Intelligence

February to July 2024

application to: abdbdourahim.sylla@grenoble-inp.fr and Maria.Di-Mascolo@grenoble-inp.fr
application deadline: January 15

Title: Characterisation of realistic use cases of manufacturing processes for the development and experimentation of Artificial Intelligence (AI) based tools for decarbonisation decision-making

Laboratory: G-SCOP

Supervisors: Abdourahim Sylla, Maria Di Mascolo
abdourahim.sylla@grenoble-inp.fr, maria.Di-Mascolo@grenoble-inp.fr

Description:
This master internship is part of a large project “DCarbo” aiming to develop a new approach and innovative tools in order to support the decarbonisation of industry. If the student is successful, a fully funded PhD program will be proposed to her/him.

Decarbonisation of industry requires better knowledge and control of CO2eq emissions from production systems (plant and supply chain). The installation of sensors at strategic locations and the provision of real-time process data could provide 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 production systems, the appropriate structure for relevant data acquisition and collection as well as the associated tools for decarbonisation decision-making. We are particularly interested in developing Artificial Intelligence (AI) based tools.**

Considering the relocation aspects of manufacturing activities, in particular in relation to circular industrial systems, the focus will be made on discrete manufacturing processes. This mode of production offers many possibilities of control because of the great variety of processes that compose it, the possibility of allocating more or less resources and of modifying the processes. **The main objective of this internship is to define realistic use cases that will serve to develop and experiment the Artificial Intelligence (AI) based tools.** To this end, the following research tasks must be performed.

- To carry out a literature review in order to define the requirements and a relevant structure for use cases relevant for AI-based manufacturing processes decarbonisation decision-making.
- To carry out a survey in specialized data storage platforms in order to identify relevant datasets to manufacturing processes decarbonisation.
- To carry out an industrial survey in order to find out potential manufacturers that are interested in collaborating and providing use cases relevant to the decarbonisation of their manufacturing processes.

Prerequisites:
Knowledge of industrial engineering and an interest for manufacturing processes are essential. A good communication skill and the ability to analyse and synthesise information are required. Knowledge and skills in statistics, data analysis, knowledge representation & reasoning and programming is appreciated, but not mandatory.