G-SCOP
SCIENCES POUR LA CONCEPTION, L'OPTIMISATION ET LA PRODUCTION

- Centre National de la Recherche Scientifique
- Grenoble INP
- Université Grenoble Alpes

Internship offer at G-SCOP Laboratory

Industrial Engineering and Artificial Intelligence

February to June 2023

application to : abdbdourahim.sylla@grenoble-inp.fr
application deadline : November 27

Title: Hybrid models for the development of intelligent tools to support decarbonisation of discrete manufacturing processes

Laboratory: G-SCOP

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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.

Note that this internship focuses on discrete process. Taking into account the relocation aspects of manufacturing activities, in particular in relation to circular industrial systems, we will also be interested in a case study of discrete manufacturing of products. 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 major objectives of this internship is twofold.

- First, the student will carry out two surveys: (i) a literature review on the application of AI approaches on the decarbonisation of discrete manufacturing processes and supply chains, and (ii) a survey on available dataset related to the decarbonisation of discrete manufacturing processes and supply chains.
- Second, the student will propose a first version of an experimentation plan that will allow generating relevant dataset on our technological platform dedicated to operations management and production systems simulation. It is also expected that the student propose a first version of an integrated approach, based on different types of AI, for industry decarbonisation.

Prerequisites:
Knowledge of industrial engineering and an interest for manufacturing processes are essential. Knowledge and skills in statistics, data analysis, knowledge representation & reasoning, and programming is appreciated.

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