Centre National de la Recherche Scientifique

Grenoble INP

Université Grenoble Alpes

Title: Minimising the impact of digital activities on greenhouse gases emission: using AI to diagnose computers' behaviour and usage

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. 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.

This internship focuses on the digital industry. While the "classical" industry is still a major contributor to energy consumption and carbon emissions, it is well established that the digital industry, with its large computing & storage centers has grown to become a key sector to consider in the fight against greenhouse gases emissions. 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 digital industries, and (ii) a survey on available dataset related to digital industries decarbonisation.
- Second, the student will study one or more digital assets centers in order to propose appropriate data structure and dataset relevant to decarbonisation decision-making. It is also expected that the student propose a first version of an integrated approach, based on different types of AI, for digital industries 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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