Research Grants for PhD students from the China Scholarship Council

Information Form (please read the guidelines carefully on the website www-csc.utt.fr)

Supervisor's name : GRUNDER Given names : Olivier

Status (prof., assistant prof., …) : Assistant Professor HDR

Laboratory :	SINERGIES laboratory	Website address : https://lab-sinergies.fr/
Institution :	Université de Technologie Belfort-Montbéliard	Website address : http://www.utbm.fr

Scientific competence of the supervisor:

- Operations research: Linear Programming, Integer Programming, Mixed-Integer Programming, Branch and bound, dynamic programming, Metaheuristics (GA, SA, TS, ACO, …), parallel optimization
- Engineering science: production, transportation and healthcare systems planning and scheduling. Lot sizing problem and batch scheduling problem.

Two major publications in the field proposed for the PhD :

1. Luo H., Dridi M., Grunder O., A branch-price-and-cut algorithm for a time-dependent green vehicle routing problem with the consideration of traffic congestion. CIE, 2023, vol. 177, p. 109093.
2. Luo H., Dridi M., Grunder O., A branch-and-price algorithm for a routing and scheduling problem in home health care from economic and environmental perspectives, RAIRO, 2022, Vol. 56, Issue 5

Website address of the personal page :

Supervisor's email : olivier.grunder@utbm.fr

Description of the research work proposed for a PhD ***Topic # (see list) :*** I-1, I-12, VI-3

Title : Minimizing costs in home healthcare transportation systems, under sustainable development considerations, with parallel optimization methods

Subject :

Today the requirements of customers in terms of costs and delays are in constant increase. Indeed, the world competition led the majority of the industrial companies to recognize the need for taking into account all the activities of the supply chain in order to reduce their costs and to increase their reactivity vis-a-vis the perpetual trends in the market. However, expectations for customers on sustainable development are also progressing significantly. In this context, this work is focused on the optimization of the costs for the production, storage and transportation activities along the supply chain, while integrating elements of sustainable development. The aim of this research is thus to investigate various supply chain integration modeling techniques, specially in home health-care systems, and propose efficient solving methods. The research work will be organized in two main steps. During the first step, initial models will be proposed according to the characteristics of the studied system. Based on mathematical properties of these models, appropriate parallel solving methods (exact procedures as well as metaheuristic-based approaches) will be developed to solve the considered problems. In a second step, elements of sustainable development, such as the carbon footprint, will be integrated to the previous models to propose efficient and sustainable solutions.

Keywords :

Health-Care Supply Chain, Operations Research, Mixed Integer Programming, Metaheuristics

Expected collaborations :

Health-care companies or local hospitals.

Background required from the applicant :

The applicant should have a formation in management science, operations research, engineering science or a related field. Basic programming skills in matlab, java or C++ as well as mathematical skills will be highly appreciated. Applicants should have good communication skills and be fluent in english.

Existence of a PDF file detailing the proposal ("yes" or "no") : no

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