

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 : Todosijevic Given names : Raca

Status (prof., assistant prof., ...): Associate Professor-HDR

Laboratory : LAMIH UMR CNRS 8201 Website address : <https://www.uphf.fr/lamih>

Institution : INSA HAUTS-DE-FRANCE Website address : <https://www.insa-hautsdefrance.fr/>

Scientific competence of the supervisor:

Operations research, mathematical optimization, location-routing, network design, vehicle routing, metaheuristics/matheuristics, stochastic optimization, sustainable logistics.

Two major publications in the field proposed for the PhD :

1. Aloullal A., Saldanha-Da-Gama F., & Todosijevic R. (2023). Multi-period single-allocation hub location-routing: Models and heuristic solutions. European Journal of Operational Research(EJOR), 310 (1), pp. 53-70.
2. Gendron, B., Hanafi, S., & Todosijević, R. (2018). Matheuristics based on iterative linear programming and slope scaling for multicommodity capacitated fixed charge network design. EJOR, 268(1), 70-81.

Website address of the personal page : <https://scholar.google.com/citations?user=jrT266gAAAAJ&hl=en>

Supervisor's email : Raca.Todosijevic@uphf.fr

Description of the research work proposed for a PhD

Topic # (see list) : VI-3

Title : AI-Enhanced Optimization of Sustainable Multi-Site Production and Multi-Echelon Distribution

Subject :

This PhD will study the integrated optimization of production and distribution decisions in multi-site industrial networks. In current practice, production planning, site specialization, and transportation are often optimized separately, which leads to under-filled trucks, weak coordination among sites, higher logistics costs, and avoidable CO2 emissions.

The project will develop AI-enhanced optimization models that jointly address production allocation, site location and specialization, real loading-rate constraints, and multi-echelon routing. Hybrid exact, heuristic, and learning-assisted methods will be designed to solve large-scale industrial instances and support robust decision-making.

The objective is to minimize CO2 emissions and transport costs while improving service level and loading-space utilization. Expected scientific contributions include new integrated models at the interface of production and logistics, efficient solution approaches, and decision-support tools validated on representative industrial case studies.

Keywords :

AI-enhanced optimization; multi-echelon routing; location-routing; production-logistics integration; low-carbon supply chains;

Expected collaborations :

Potential collaborations with the members of operations research team of LAMIH, CIRRELT Canada and The University of Sheffield

Background required from the applicant :

The applicant should have a strong background in operations research, optimization, industrial engineering, applied mathematics, or computer science. Good programming skills (e.g., Python, C++, or Julia) are expected. Knowledge of mathematical programming, metaheuristics, logistics/supply chain modeling, and basic AI/ML methods will be an advantage.

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

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