DMS LOGISTICS - The container logistics dispatcher
PhD student in Data Science

<u>Titre de la thèse / Thesis title:</u>

🇫🇷 **L'IA pour l'optimisation des flux logistiques dans les zones enclavées.**

🇬🇧 **AI for optimizing logistics flows in landlocked areas.**

<u>Company :</u> DMS Logistics - https://dms-logistics.io/ (Marseille).

<u>Laboratory:</u> Ecole des Mines de Saint-Etienne - Department of Manufacturing Sciences & Logistics, UMR CNRS LIMOS 6158, Campus Georges Charpak Provence, Gardanne (Bouches-du-Rhône).

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<u>Keywords:</u> supply chain modeling and optimization, containers supply chain, forecasting, uncertainty

1/ Background

<u>PROBLEM:</u> Today, container logistics remains a major challenge in emerging countries (Africa, Latin America). The actors of the sector in these countries still manage a lot of their operations manually, suffer from a lack of communication between the different stakeholders and the supply chains are impacted, delayed.

<u>IMPACT:</u> This opacity in operations has a strong impact on traffic (late deliveries, long waits at terminals, congested ports…), which slows down the development of these ecosystems and may discourage new entrants from investing in these areas.

> « **The good connection of ports with their hinterland is one of the key factors for growth and the opening up of territories in Africa.** »
>
> Patrick Claes, CEO of Vecturis, a railway company in Africa,
> THE PORT SECTOR IN AFRICA : FULL COURSE FOR DEVELOPMENT, 2019

SOLUTION: Achieving a global vision of logistics in an area is therefore a major challenge for its development. Also, today, even if maritime players invest heavily in their communication tools, the land-based part of containers remains rather opaque, often subcontracted to many small local players who are not equipped to communicate effectively about their operations.

IMPLEMENTATION: The challenge is therefore to succeed in bringing together all these container players on land, with the aim of obtaining all the information necessary for the proper conduct of operations. In this way, it will be possible to anticipate the various container flows and guide all the parties in a supply chain in the conduct of their operations and the defense of their interests.

2/ Objectives

This thesis is part of the development of an IT solution that aims to provide the actors of container logistics (ship owners, ports, carriers, forwarders, states…) with a tool for decision-making support and visibility on the land operations of their containers and therefore for the fluidity of their activity. This study focuses on land-based logistics and should make it possible to anticipate all container movements on land (transport, storage, handling, maintenance).

More specifically, the aim is to understand the mechanisms at the origin of slowdowns in container exchanges, and to be able to formulate prediction and optimization algorithms.

This research and development project therefore aims to model container flows over areas, and represent them as:
- **dynamic** maps (past / present real time / future),
- **real-time** statistical dashboards,
- **recommendations** on the best actions to take (Business Intelligence),
- **real-time notifications** to stakeholders (on their mobile terminal).

The decision-making tools developed by the PhD student aim at :
- **Processing** of vehicle positions and road congestion on graphs,
- **Forecasting** container operations,
- **Calculating** of the best routes (shorter, cheaper, less harder for the truck).

Data of a different nature will be used:
- **Cold:** road travel times, container yard surfaces, rolling stock capacity…
- **Warm:** ship manifests, number / availability of resources (human and material)….
- **Hot:** operations and movements on containers, weather, piracy information, road accidents, traffic congestion at a gatehouse or crossing point …

3/ Profile required

Candidates must have a master's degree (or equivalent) in computer science, statistics or related disciplines. Candidates must demonstrate good programming and data processing skills; a mastery of all statistical analysis tools and methods is desirable. Thus the candidate will have to master the main Data Science languages (R, Python…), data and query management systems, as well as Machine Learning methods.

Knowledge of port logistics, container transport and, above all, a very strong interest in the related experimental methods and data processing are of importance for the successful completion of this subject. The candidate must be self-reliant and show a strong sense of initiative. A good knowledge of French and English is essential.

4/ Application

Please send your application by email (in a single file) including a detailed CV, transcripts and letters of recommendation (if applicable) to Nabil ABSI (absi@emse.fr). For further information, please contact Nabil Absi, Dominique Feillet or Olivier Raveau.