

PhD offer

2025-2028

Optimization of first aid supplies and inventory using artificial intelligence and the physical internet



Keywords:

Inventory management, supply chains, decision support, risk management, civil security, artificial intelligence, physical internet.

Host Institutions:

The thesis will be hosted by the Industrial Engineering Center (CGI) at IMT Mines Albi, and co-hosted by the Centre for Management Science (CGS) at Mines Paris PSL.

Industrial engineering center of IMT Mines Albi (Albi, France): <https://cgi.imt-mines-albi.fr/>

Centre for Management Science of Mines Paris PSL (Paris, France): <https://www.cgs.minesparis.psl.eu/>

Advisors and CVs:

Supervisors:

- Jacques LAMOTHE (IMT Mines Albi) (<https://cv.hal.science/jacques-lamothe>)
- Shenle PAN (Mines Paris PSL) (<https://cv.hal.science/shenle-pan>)

Co-Supervisor:

- Raphaël OGER (IMT Mines Albi) (<https://cv.hal.science/raphael-oger>)

Location:

The distribution of time between the two centers during the thesis can be discussed.

Contract:

3-year full-time contract, starting no later than 2025.

Application:

Applications (CV, cover letter, Master's transcript, and any document likely to help assess the candidate's level and motivations) must be sent by e-mail to raphael.oger@mines-albi.fr before November 30th, 2025. Shortlisted applicants will have the opportunity to present their motivations orally during an interview to be scheduled in Week 49 of 2025.

For additional information, you can contact raphael.oger@mines-albi.fr.

Topic:

Emergency logistics, or more widely humanitarian logistics, refers to the organization and planning of the flow of goods, operations, and services before and during disasters, crises, or emergencies, such as natural disasters, pandemics, or civil crises (Kundu et al., 2022). Emergency resource supply, scheduling, and distribution are crucial. The research aims to develop a methodology combining Artificial Intelligence (Sapkota et al., 2026) and the Physical Internet (Montreuil, 2011, Pan et al., 2025) to transform emergency logistics, which is currently too slow and inflexible in the face of multiple crises and faced with significant dormant stocks outside of crises. The solution would enable adaptive, shared resource management of emergency stocks and flows, and logistics services. The goal is to reduce delays, costs, and environmental impact, while ensuring coordination between actors, sovereignty over critical product flows, and regional resilience.

Research team:

A team on a human scale, benevolent, competent, ambitious, open to the international, and in constant contact with the business reality (companies, public services, NGOs, etc.).

Applicant's profile:

Holder of a master's degree in engineering, science, or management with proven knowledge in one or more of the following fields: industrial engineering, supply chain management, artificial intelligence, decision sciences, data sciences, applied mathematics, simulation models, decision support systems, or business intelligence. A strong background in logistics and supply chain management is highly desirable.

A good level of English, both in writing and presentation, is required. Strong skills or a strong motivation in computer programming are preferred.

References:

- Montreuil, B., 2011. Toward a Physical Internet: meeting the global logistics sustainability grand challenge. *Logist. Res.* 3, 71–87.
- Pan, S., Ballot, E., Huang, G.Q., 2025. Operations with physical internet, in: Reference Module in Social Sciences. Elsevier. <https://doi.org/10.1016/B978-0-443-28993-4.00171-2> (https://www.researchgate.net/publication/388216063_Operations_with_Physical_Internet)
- Kundu, T., Sheu, J.-B., Kuo, H.-T., 2022. Emergency logistics management—Review and propositions for future research. *Transportation Research Part E: Logistics and Transportation Review* 164, 102789. <https://doi.org/10.1016/j.tre.2022.102789>
- Sapkota, R., Roumeliotis, K.I., Karkee, M., 2026. AI Agents vs. Agentic AI: A Conceptual taxonomy, applications and challenges. *Information Fusion* 126, 103599. <https://doi.org/10.1016/j.inffus.2025.103599> (<https://arxiv.org/pdf/2505.10468>)