ParisTech

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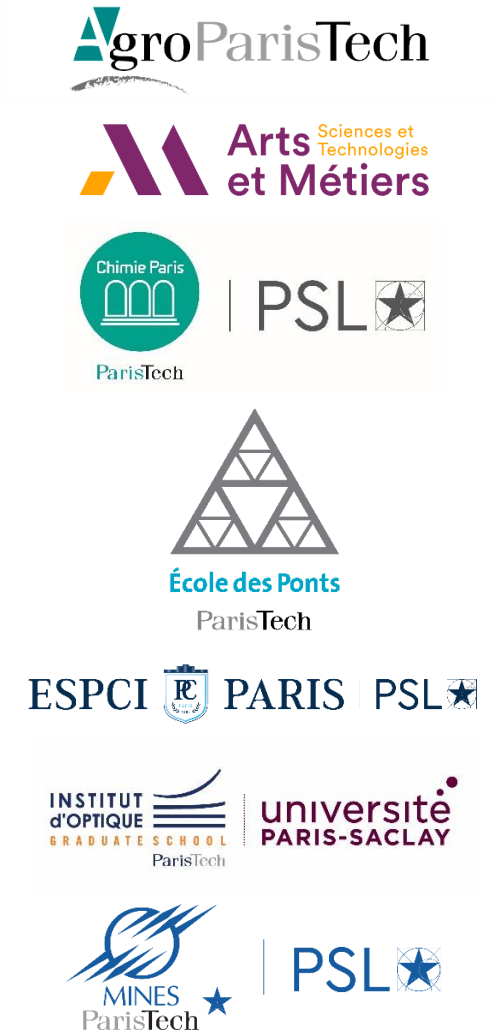

RESEARCH TOPIC FOR THE PARISTECH/CSC PHD PROGRAM
(one page maximum)

Field: Economics, Management and Social Sciences

Subfield: Logistics and Supply Chain and Management

Title: Performance of interconnected logistics networks under uncertainty

ParisTech School: MINES ParisTech | PSL

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(Lab/Advisor website): www.cgs.mines-paristech.fr

Short description of possible research topics for a PhD: (10-15 lines in English + optional figure)

Due to economic globalization, today's supply chain and logistics networks are more complex and stringent than ever before, and facing many uncertainties like market volatility, global transportation service and lead-time, or global or local disruptions like the COVID pandemic. How to effectively and efficiently manage supply chains and the operations under such uncertainties remains a major challenge in the field of supply chain management (SCM). Physical Internet, aiming at the interconnection of independent logistics or supply networks via physical and informational interoperability, is a recent breakthrough logistics paradigm, and that seems promising. Its potential on improving logistics efficiency and sustainability has been demonstrated by former research works. However, the question of how it could alleviate the uncertainties by enhancing the agility and resilience is not yet studied in the literature. The thesis will focus on the later question, and apply modelling approaches (especially, robust optimization, coupling optimization-simulation) for quantitative and qualitative research. The PhD candidate will join the team and the Physical Internet Chair, in order to work closely with researchers and industrial partners.

Required background of the student: (What should be the main field of study of the applicant before applying?)

The applicant should have master degree in logistics or supply chain management. Solid knowledge on mathematic modelling is also required, for example, Operational Research, multi-agent or discrete event simulation.

A list of 5 (max.) representative publications of the group: (Related to the research topic)

1. Pan S, Trentesaux D, Ballot E. and Huang G. (2019). "Horizontal collaborative transport: survey of solutions and practical implementation issues". International Journal of Production Research, 57 (15-16). 10.1080/00207543.2019.1574040.
2. Lafkihi M., Pan, S. & Ballot, E. (2019). "Freight Transportation Service Procurement: A literature review and future research opportunities in Omnichannel E-commerce". Transportation Research Part E, 125, 348-365 doi.org/10.1016/j.tre.2019.03.021
3. Yang Y, Pan S, and Ballot E (2016). "Mitigating supply chain disruptions through interconnected logistics services in the Physical Internet". International Journal of Production Research, 55(14): 3970-3983.
4. Sarraj R, Ballot E, Pan S, Montreuil B. and Hakimi D. (2014). "Interconnected logistic networks and protocols: simulation-based efficiency assessment." International Journal of Production Research. 52(11): 3185-3208
5. Pan S, Ballot E. and Fontane F. (2013). "The reduction of greenhouse gas emissions from freight transport by merging supply chains." International Journal of Production Economics. 143(1): p. 86-94