City Logistics: decision-making in a complex system

Athens Programme at MINES ParisTech – March 2021

This course aims at providing an introduction to the main notions, stakes, difficulties and opportunities related to urban logistics. In this field, problems tend to be complex with many actors (residents, professionals and authorities) that often haven contradictory objectives.

An important part of it focuses on modelling and simulation tools, available to describe and predict the various ways in which urban logistics systems might react to changes in terms of policies, regulations, or behaviours of actors.

The course also aims at raising awareness about these tools thanks to the advances in research field of Social and Human Sciences.

The course is based on four specific objectives as follows:

- Understand why urban logistics cannot follow the same logic of management as "classical logistics", especially in terms of massification choices, delays and inventory management.
- Analyse recent developments in the context of urban logistics in France and abroad (e.g. increase in the costs of land, multiplication of relay points, the outburst of e-commerce, etc.).
- Introduce modelling and simulation tools available to engineers in order to propose thorough analysis and innovative solutions to problems in the field of urban logistics.
- Understand the limits and the bias of using technology on social objects

	MON 15th MAR	TUE 16th MAR	WED 17th MAR	THU 18th MAR	FRI 19th MAR
09h00 10h30	General Introduction Arthur Gaudron	Governing the Digital City Antoine Courmont Urban growth and freight transport: from sprawl to distension Mathieu Gardat	New technologies and society Yaëlle Amsallem	Introduction to Operation Research Arthur Gaudron	Modelling a system Arthur Gaudron
10h45 12h15	Urban logistics, decision making Arthur Gaudron	Management, policy and innovation for city logistics Laetitia Dablanc	New technologies and society Yaëlle Amsallem	Introduction to Operation Research Arthur Gaudron	Modelling a system Arthur Gaudron
14h00 15h30	New technologies and society Yaëlle Amsallem	New technologies and society Yaëlle Amsallem	Autonomous Vehicles for city logistics Arnaud de La Fortelle Kartik Varma	Modelling a system Arthur Gaudron	Modelling a system Arthur Gaudron
15h45 17h15	Large-scale traffic simulations Sebastian Hörl	New technologies and society Yaëlle Amsallem	Network Design in Urban Last-Mile Logistics Milena Janjevic	Modelling a system Arthur Gaudron	Modelling a system Arthur Gaudron

Speakers

Arthur Gaudron is an Associate Professor in the Center for Robotics at MINES ParisTech, PSL University. He develops his research about system modelling within the Chaire Logistique Urbaine (sponsored by La Poste, Pomona, Renault, ADEME and the City of Paris) with a focus on the effectivity of decision support systems. Among his teaching duties, he manages the Mastère Spécialisé Management Industriel et Systèmes Logistique, and he is the coordinator of the ATHENS week "*City Logistics: decision-making in a complex system*".

Yaëlle Amsallem is a PhD Candidate in the Management department at ESCP Business School. At ESCP she teaches the course « Management and Organizations » and the seminar « Designing Tomorrow ». She has held a visiting student position at the University of California, Berkeley. In her research she examines how technologies are shaping new forms of organizations, bringing important political and societal issues. Her research interests include the history and transformation of capitalism as well as the Silicon Valley's ideology.

Sebastian Hörl is a researcher at IRT SystemX in Paris where he is involved in various projects on agent-based transport simulation for passenger transport and logistics. He received his MSc in Complex Adaptive Systems at Chalmers University of Technology in Gothenburg and his PhD in Transport Planning at ETH Zurich. His main interests revolve around the topics of replicable use of open data and software in transport planning and applied large-scale transport simulation.

Antoine Courmont, doctor in political science, is the scientific director of the Digital Cities Chair of Sciences Po. His research focuses on the recomposition of urban governance in the digital age. Antoine has recently published the books "Quand la donnée arrive en ville. Open Data et gouvernance urbaine" (PUG, 2021) and "Gouverner la ville numérique" (PUF, 2019).

Mathieu Gardrat is a research engineer at the Transport Urban Planning Economics Laboratory in Lyon. He holds a Master's degree in Logistics and a PhD. in Geography and urban planning. His researches are structured around survey methods, data processing and modelling related to urban freight transport. He has been actively participating in research projects related to these subjects since 2011 in close cooperation with the French Ministry of Transport and local authorities: French Urban Goods Movements Surveys, E-Commerce Mobility Surveys, development of FRETURB and SILOGUES urban freight models. He co-pilots the Lyon Urban Goods Movements chair of the University of Lyon and also manages projects aiming at the production of serious games on urban logistics."

Laetitia Dablanc, an urban planner, is a Director of Research (equivalent to Professor) at the University Gustave Eiffel/IFSTTAR French Institute of Science and Technology for Transport where she heads the Chair Logistics City. She is a member of MetroFreight, an international network of research on urban freight sponsored by VREF. She leads the Young Initiative of the World Conference of Transport Research Society. Her areas of research are freight transportation, freight and the environment, urban freight and logistics, freight policies, spatial issues related to logistics. She received a PhD in transportation planning from Ecole des Ponts-ParisTech, and a Master's degree in city and regional planning from Cornell University. She was initially trained in policy analysis and economics at Science Po Paris. She is an Associate Professor of the University of Gothenburg, Sweden.

Prof. Arnaud de La Fortelle has engineer degrees from the French École Polytechnique and École des Ponts et Chaussées (2 top French institutions) and a Ph.D. in Applied Mathematics (Probability Theory) prepared at Inria. Arnaud de La Fortelle first studies theoretical properties of probability distributions (large deviations) with application to queuing networks. He applies this knowledge to vehicle networks with a special focus for cybercars (automated urban shuttles). Then he investigates communications for cooperative systems and the architecture needed in distributed systems. His main topic of interest is now cooperative systems (machine learning, data distribution, control, mathematical certification) and their applications (e.g. Autonomous driving, urban logistics).

Kartik Varma is a PhD Candidate at the Research and Innovation department at Groupe Renault and at the French Institute for the Science and Technology of Transports (IFSTTAR). He uses a multidisplinary approach combining Economics, Psychology and Engineering to shed light on the potential use of autonomous vehicles in urban logistics.

Dr. Milena Janjevic is a Research Scientist at Massachusetts Institute of Technology, Center for Transportation and Logistics. She is a Polytechnical Engineer and holds a Ph.D. in Transport and Logistics Engineering from the Université libre de Bruxelles in Brussels, Belgium. She is also a Lecturer at Université libre de Bruxelles at the Center for Mobility studies. Her current research focuses on urban logistics and last-mile delivery with a particular emphasis on distribution network design in the context of e-commerce deliveries and urban freight logistics policies.