



Joint Webinar CIRRELT, MobilOpt and Canada research chair in integrated logistics

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Faculty of Business Administration
MobilOpt: Mobility Optimization



Canada research chair
in integrated logistics

VEHICLE ROUTING IN THE CHEMICAL PROCESS INDUSTRY

Abstract: The chemical process industry has traditionally been a major user of mathematical modeling and optimization methodologies to address issues of process design and control, planning and scheduling, as well as to design novel chemical products. In recent years, as profit margins are squeezed on the manufacturing side, there has been a renewed focus for the industry to also use such rigorous approaches to improve the profitability of its supply chains, including the costs for last-mile distribution of the chemical products—whether packaged or in bulk form.

In this talk, we will review some works we have performed in partnership with industrial partners at the Center for Process Decision-making at Carnegie Mellon to advance and employ vehicle routing approaches to address specific settings that arise in their business context. Besides their obvious value for operational decision-making, we also show how the solutions of vehicle routing problems could be used at a more strategic level, in order to assess the impact that various higher-level business decisions could have on the cost of distribution on average.

We start with a multi-period setting arising in the supply chain of industrial gases, and we investigate the extent to which the incorporation of flexibility in customer day windows can lead to reductions in overall routing costs. We then switch focus to describe a methodology we have devised to estimate the marginal impact that individual customers exert on the overall cost of distribution. We conclude with presenting a specific profit-collecting, full truckload pickup and delivery problem arising in the distribution of bulk chemicals. For this problem, we conduct a series of rolling-horizon simulations that help us quantify the savings that the practice of preloading trucks before the end of a shift can have on overall performance.

Bio: Chrysanthos Gounaris is currently Associate Professor of Chemical Engineering at Carnegie Mellon University. He received a Ph.D. in Chemical Engineering from Princeton University. After graduation, Chrysanthos worked as an Associate at McKinsey & Co, before joining the Department of Chemical Engineering at Carnegie Mellon University in 2013. His research interests lie in the development of theory and quantitative methodologies for decision-making, with emphasis in supply chain optimization and distribution logistics, production planning and scheduling, project management, process design under uncertainty, microporous and nanostructured materials design, as well as methods and tools for robust optimization and global optimization. Chrysanthos actively participates in the Center of Advanced Process Decision-making consortium, where he now directs its Enterprise-Wide Optimization special interest group. Recent recognitions for Chrysanthos include his being named a “2020 MSDE Emerging Investigator”, his induction in the “2019 I&ECR Class of Influential Researchers”, the Glover-Klingman Prize, the CIT Dean’s Early Career Fellowship, and the Kun Li Award for Teaching Excellence.

Lien zoom: <https://ulaval.zoom.us/j/81872924276?pwd=Y2t6ZGtPVmQwWnBzTVUyeUhKZ0lydz09>

MERCREDI / WEDNESDAY

2 décembre / December 2nd

10h00

Ouvert à tous
Open to all

Responsable / Organizer

Leandro Coelho