



CIRRELT

# 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

### FLEXIBLE JOB SHOP SCHEDULING PROBLEMS WITH ARBITRARY PRECEDENCE GRAPHS

**Abstract:** A common assumption in the shop scheduling literature is that the processing order of the operations of each job is sequential; however, in practice there can be multiple connections and finish-to-start dependencies among the operations of each job. This work studies flexible job shop scheduling problems with arbitrary precedence graphs. Mixed integer and constraint programming models are presented, as well as an evolutionary algorithm is proposed to solve large-scale problems. The heuristic solution framework is equipped with efficient evolution and local search mechanisms as well as new feasibility detection and makespan estimation methods. Computational experiments on existing benchmark data sets show that the new solution methods outperform the current state-of-the-art solution methods. In particular, the constraint programming approach seems very powerful, while the proposed evolutionary algorithm maintains a good balance between effectiveness and efficiency, and it is very robust in terms of deviations observed over multiple runs. To explore the impact of the arbitrary precedence graphs, lower bounds and heuristic solutions are generated for new large-scale problems. These experiments illustrate that the machine assignment flexibility and density of the precedence graphs affect not only the makespan, but also the hardness of deriving good upper bounds.

**Bio:** Dr Panagiotis Repoussis is Assistant Professor at the Department of Marketing and Communication, School of Business at Athens University of Economics and Business (Athens, Greece) and visiting Assistant Professor at the School of Business at Stevens Institute of Technology (New Jersey, USA). He obtained his Ph.D. from the Athens University of Economics and Business in 2008 after obtaining his M.Sc. degree in Process Systems Engineering at Imperial College (London, UK). He has published a number of substantial and important articles on the design, development and application of mathematical models and computationally intelligent algorithms to aid rigorous decision making in operational planning and scheduling of resources. His work has concentrated in the areas of network design, supply chain management, inventory management, production scheduling, and freight transportation and logistics with particular emphasis in the field of vehicle routing and scheduling problems.

Lien zoom: <https://ulaval.zoom.us/j/83663885955?pwd=MGRDWk9ablJOb3ZOVHVSZzViVkIYZz09>  
Meeting ID: 836 6388 5955 Passcode:095632

## MARDI / TUESDAY

17 novembre 2020, 10h00  
November 17th, 2020, 10:00

Ouvert à tous  
Open to all

### Responsables / Organizers

Maryam Darvish  
Leandro Coelho

