

FACULTY OF ENGINEERING
DEPARTMENT OF MANAGEMENT SCIENCE AND ENGINEERING

**Integrating operational problems to the master surgical planning in the
operating rooms**

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Abstract: In this talk, I will introduce a novel approach to the master surgical planning in the operating room. Patient case mix is integrated to the master surgical planning problem to have a finer estimation of the use of resources. This problem consists of selecting patients (from the wait list) to be on the operating list for a selected horizon, and assigning a day, an operating room, and a time block to each specialty. Bed resources in the surgical wards and in the ICU are also considered. Two case studies will illustrate this approach. The first one focuses on clusters of patients to be scheduled to better use the beds in a deterministic setting. In the second one, I will show how the integration of the cancellation probability due to congestion in the intensive care unit can be done. The approach is based on integrating the graph derived from a Markov Decision Process that computes the probability of canceling cases on each day. We show that prioritizing patients based on wait times only increases the quality of the schedule without decreasing the occupancy rate of the OR.

Bio: Dr. Nadia Lahrichi holds a PhD in applied mathematics from Polytechnique Montréal. She is currently a full professor at the Department of Mathematics and Industrial Engineering at Polytechnique Montréal and the codirector of CIRRELT. Her research is mainly focused on applying modeling and operational research tools to improve patient flow in the healthcare system. She uses exact, metaheuristics, and discrete event simulation approaches to tackle patient and resource scheduling problems. She has published more than 50 papers in peer-reviewed journals and received the award for outstanding application of operational research (from the Canadian Operational Research Society) for solving the home health care routing and scheduling problem. She is an associate editor of Health Care Management Science and Operations research for Health Care. She co-organized multiple international conferences such as Optimization Days, Odysseus, NOW, and ORAHS.