
Graphical Optimization Models to address the Multi-Activity Shift Scheduling Problems

Louis-Martin Rousseau

Abstract The shift-scheduling problem was originally introduced by Edie in 1954 in the context of scheduling highway toll booth operators. It was solved a short time later, by Georges Dantzig, using a set covering formulation. However, the Multi-Activity Shift Scheduling (MASSP) version of that problem, where one not only needs to schedule when employees are working or resting, but more precisely, what activity they are performing, still remains a challenge. During this invited lecture, we will recall the turning points of this 60-year journey, focusing particularly on the efforts of the last decade to solve MASSPs. We will demonstrate our formal languages can generate Graphical Models that can be used in Integer Program, Constraint Program, Branch and Price and Meta heuristics. We also discuss results on Multi-activity Tour Scheduling Problems and variants with stochastic demand.

Louis-Martin Rousseau
Department of Mathematics and Industrial Engineering
École Polytechnique de Montréal, Canada
E-mail: louis-martin.rousseau@polymtl.ca