

Grammar-Based Integer Programming Models and Methods for Employee Scheduling Problems

Bernard Gendron, CIRRELT, University of Montréal, bernard.gendron@cirrelt.ca
Louis-Martin Rousseau, École Polytechnique de Montréal, louis-martin.rousseau@cirrelt.net

We present an overview of several models and methods for solving employee scheduling problems. All approaches make use of context-free grammars to represent the rules for the composition of work shifts. We focus on the multi-activity shift scheduling (the allocation of shifts and breaks to several employees on a given day) and tour scheduling (the allocation of work days to several employees over a given planning horizon) problems. Both the anonymous (employees are identical) and the personalized (employees have different preferences and skills) cases are considered. Decomposition methods based on column generation and Benders approaches are presented.