



CIRRELT

CRI²GS

Centre sur l'intelligence² en
gestion de systèmes complexes

Séminaire conjoint CRI²GS et CIRRELT

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Integrated lot sizing and preventive maintenance planning problem for a single machine

Abstract:

This study proposes new mathematical formulations as mixed-integer linear programs for an integrated Capacitated Lot Sizing and Preventive Maintenance problem. We provide a reformulation of the maintenance decision variables (extended maintenance formulation) that are incorporated into the classical and facility location lot sizing formulations. Also, we apply a Dantzig-Wolfe (DW) decomposition to these models by using maintenance patterns. We demonstrate theoretically that the extended maintenance formulation gives a relaxation equivalent to the one of the DW decomposition model. Subsequently, we combine a relax-and-fix and a fix-and-optimize heuristic to solve the original problem. The relax-and-fix heuristic is used to build an initial solution and the fix-and-optimize heuristic improves the obtained solution. Computational experiments evaluate the performance of the heuristics and the models solved with Gurobi on instances generated for our study. The results show that the solutions obtained by the heuristics are close to those obtained by the models in terms of gap.

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Harcènege DANSOU is a student at ESG-UQAM and ENAC - Toulouse with a Bachelor's degree in Mathematics and a Master's degree in Operational Research. He is interested in integrated production and maintenance problems in the aeronautics sector.

MARDI / TUESDAY

26 Novembre / November 26th, 2024

13h30

Salle / Room DS-3650
Pavillon des sciences de la gestion
ESG-UQAM

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