

---

# Robust Configuration Design of Sustainable Reconfigurable Manufacturing System Under Uncertainty

Alireza Ostovari\*<sup>1</sup>, Lyes Benyoucef<sup>1</sup>, Hichem Haddou Benderbal<sup>1</sup>, and Xavier Delorme<sup>2</sup>

<sup>1</sup>Laboratoire d'Informatique et des Systèmes – Aix Marseille Université, Université de Toulon, Centre National de la Recherche Scientifique – France

<sup>2</sup>Mines Saint-Etienne, Univ Clermont Auvergne, INP Clermont Auvergne – CNRS : UMR6158 – France

## Résumé

Due to global competition and ongoing technological advancements, modern manufacturing requires highly flexible and responsive systems to adapt to market changes. Reconfigurable manufacturing systems (RMS) facilitate this responsiveness through their fundamental characteristics. This study looks into RMS configuration design from the perspective of a sustainable and scalable system in an uncertain environment. This solution makes use of reconfigurable machine tools (RMT). In reality, a specific modular reconfigurable machine's production capabilities could be increased while still being reasonably priced by adding/removing modules from it. To address this issue, a mixed integer linear multi-objective scenario-based robust programming to determine the best set of RMTs is presented. The objective functions are minimizing overall cost and energy consumption. By solving the illustrative numerical example, the output of the singular and multiobjective model in the robust and deterministic mode is investigated.

---

\*Intervenant