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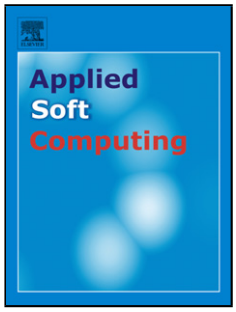

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A Multi-Stage Dynamic Soft Scheduling Algorithm for the Uncertain Steelmaking-Continuous Casting Scheduling Problem

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Highlights

- The uncertain SCCSP is decomposed into the global and local scheduling problems.
- To solve the uncertain SCCSP, a multi-stage dynamic soft scheduling (MDSS) algorithm is proposed.
- To solve the global scheduling problem, a dynamic multi-objective differential evolutionary based on decomposition is proposed.
- To solve the local scheduling problem, a knowledge-based differential evolutionary based on interval TOPSIS is proposed.
- Computational results demonstrate that the MDSS algorithm outperforms previously described algorithms

Abstract: The steelmaking-continuous casting (SCC) manufacturing system is usually regarded as a cornerstone as well as a bottleneck in a modern integrated steel company. In this study; we consider an uncertain scheduling problem that arises from the SCC manufacturing system where the processing times and arrival times are in intervals. To solve this problem; we propose a multi-stage dynamic soft scheduling (MDSS) algorithm based on an improved differential evolution. In the proposed algorithm; the uncertain SCC scheduling problem is decomposed into global and local scheduling problems. The global scheduling problem comprising cast units is solved by a dynamic multi-objective differential evolutionary algorithm based on decomposition where each solution is evaluated in the worst-case

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