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# Evolving Dispatching Rules Using Genetic Programming for Multi-objective Dynamic Job Shop Scheduling with Machine Breakdowns

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## Abstract

Dynamic Job Shop Scheduling Problem (DJSSP) is an NP-hard problem that has a great impact on production performance in practice. The design of Dispatching Rules (DRs) is very challenging because many shop attributes need to be investigated. Therefore, this paper proposes a Genetic Programming (GP) approach to generate DRs automatically for multi-objective DJSSP considering machine breakdowns. Computational experiments are conducted to compare the GP rule performance with 12 literature rules. The results indicate the superiority of the GP rule in minimizing mean flow time and makespan simultaneously. Finally, the best evolved rule is analyzed, and the significant attributes are extracted.

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