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A High-Level Co-Evolutionary Hybrid Algorithm for the Multi-Objective Job Shop Scheduling Problem

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Abstract : In this paper, a hybrid distributed algorithm has been suggested for the multi-objective job shop scheduling problem. Many new approaches are used at design steps of the distributed algorithm. Co-evolutionary structure of the algorithm and competition between different communicated hybrid algorithms, which are executed simultaneously, causes to efficient search. Using several machines for distributing the algorithms, at the iteration and solution levels, increases computational speed. The proposed algorithm is able to find the Pareto solutions of the big problems in shorter time than other algorithm in the literature. Apache Spark and Hadoop platforms have been used for the distribution of the algorithm. The suggested algorithm and implementations have been compared with results of the successful algorithms in the literature. Results prove the efficiency and high speed of the algorithm.

Keywords : distributed algorithms, Apache Spark, Hadoop, job shop scheduling, multi-objective optimization
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