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# WORKING PAPER

# A hybrid single and dual population search procedure for the job shop scheduling problem

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# A hybrid single and dual population search procedure for the job shop scheduling problem

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**Abstract**

This paper presents a genetic algorithm and a scatter search procedure to solve the well-known job shop scheduling problem. In contrast to the single population search performed by the genetic algorithm, the scatter search algorithm splits the population of solutions in a diverse and high-quality set to exchange information between individuals in a controlled way. Extensions from a single to a dual population by taking problem specific characteristics into account can be seen as a stimulator to add diversity in the search process, which has a positive influence on the important balance between intensification and diversification. Computational experiments verify the benefit of this diversity on the effectiveness of the meta-heuristic search process. Various algorithmic parameters from literature are embedded in both procedures and a detailed comparison is made. A set of standard instances is used to compare the different approaches and the best obtained results are benchmarked against heuristic solutions found in literature.