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Solving fuzzy flexible job shop scheduling problem based on fuzzy satisfaction rate and differential evolution

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ABSTRACT

Focused on a variety of JSSP considered flexibility and fuzziness, namely the fuzzy flexibility JSSP (FfJSSP), a novel method based on fuzzy satisfaction rate and differential evolution (DE) algorithm is proposed in this paper. In the method, the fuzzy membership functions' parameters are determined according to normal distribution for maximum satisfaction rate calculation. Then a DE algorithm is proposed by well designing the coding for the problem and extending the related operators on the coding. A local exploring search for operation and machine parts of the coding is also introduced to improve the performance of the method. Experimental results show that our proposed method is effective compared with other five popular existed methods. Comparisons between different mutation and crossover strategies are also performed. Numerical results show that the proposed method could be applied to real FfJSSP problems.

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