Similar Particle Collision for the Job Shop Scheduling Problem

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Abstract   In this paper we present the Similar Particle Collision heuristic (SPC) and the Similar Particle Multicollision algorithm with Exploration by Tabu Search, specially developed to solve the Job Shop Scheduling Problem. Although there is a wide range of heuristics and algorithms developed to solve this famous problem, the SPC has an interesting characteristic, since its application is not very sensitive to the adjustment of the parameters used. Another important characteristic is that the presented heuristic allows the successful hybridization of different algorithms mixing aspects of local and global exploration. As we can see, the results are as good as the best results presented in the literature and the method attenuates the different results found by adjusting the parameters, leading to a more robust search.

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1 Introduction

Talk about heuristics for combinatorial optimizatiom problem and hibridization.

1.1 Job Shop Scheduling Problem

Present the Job Shop Scheduling problem. Lecture on the algorithms applied to solve the problem and in particular on hybrid algorithms.

1.2 Particle Collision method

Present the Sacco's Particle Collision method.

Than inform what subject is discussed in this paper and highlight the innovative aspects of the work

2 Similar Particle Collision heuristic

In Similar Particle Collision heuristic (Fig. 1) the functions, Disturbance() and Exploit() are respectively replaced by operators of Disturbance and Local Exploration. As Disturbance operators, whose purpose is to take the algorithm to new search spaces, we sugest mutation operators used in Genetic Algorithms, such as the operators M1 to M10 presented by Lian et al. (2006). Alternatively, if the Similar Particle Collision algorithm is applied simultaneously to all individuals of an initial population, we sugest crossover operators used in Genetic Algorithms, applied on pairs of solutions, such

as the operators C1 to C4 also presented by Lian et al. (2006). In the case of Local Exploration operators, whose purpose is to explore the surroundings of a given solution, we suggest the various local search algorithms built based on heuristics such as Simulated Annealing, Genetic Algorithms, Particle Collision and Tabu Search.

3 Similar Particle Multicollision algorithm with Exploration by Tabu Search

Include explanation about the algorithm and [1]

4 Tests and results

??.

5 Conclusions and future work

References

1. Author, Journal **Volume,** (year) page numbers.
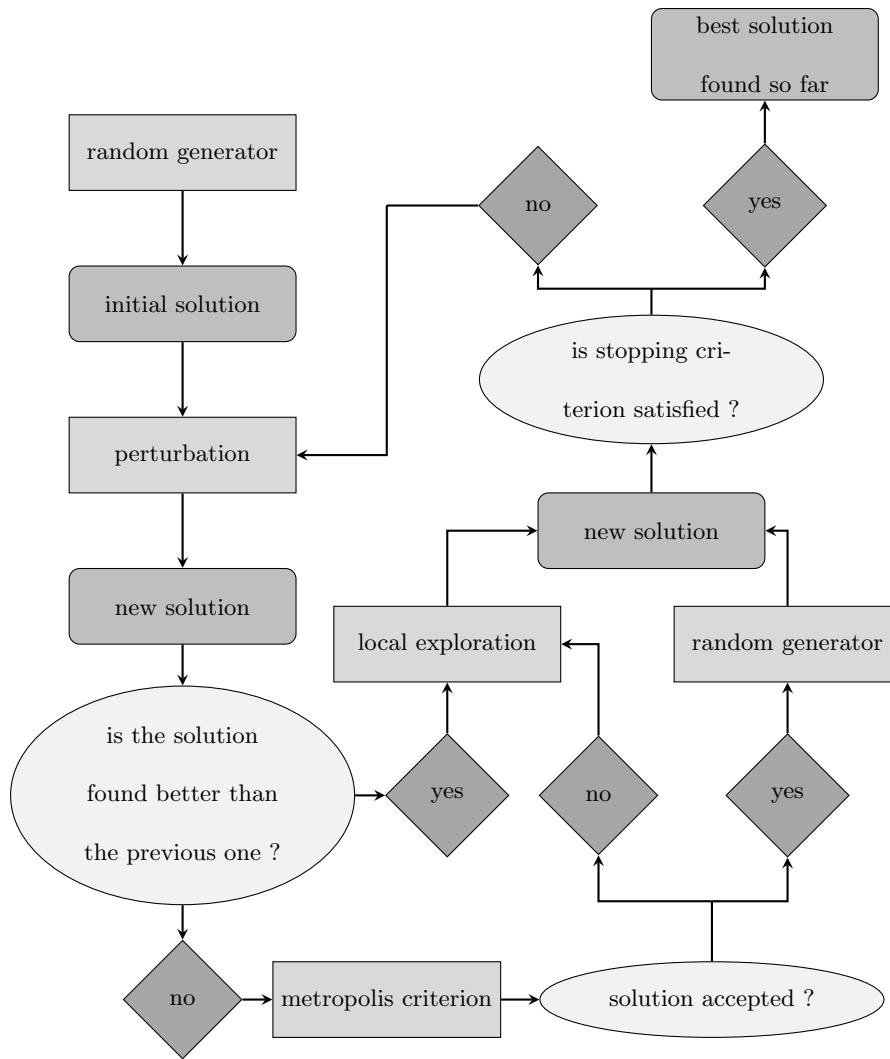
2. Author, *Book title* (Publisher, place year) page numbers

Fig. 1 Particle Collision Heuristic.

Fig. 2 Please write your figure caption here

Fig. 3 Please write your figure caption here

Table 1 Please write your table caption here

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number	number	number
number	number	number