

Using A Multiple-GA Approach to Solve Batch-picking Problem: Considering the Travel Distance and Order Due Time

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ABSTRACT

Warehouse management is one of the critical keys to strengthen company logistics. Effective batch picking operations can increase the productivity of a warehouse. To attain better batch picking efficiency, previous researches mainly focus on the problems of smaller order size and specific warehouse layouts. In addition, their methods either consider travel cost or earliness and tardiness penalty separately. These drawbacks make these methods hard to be adopted in current complex and quick-response oriented environment.

In this thesis, we develop a multiple-GA (Genetic Algorithm) method, which consider both travel cost and earliness and tardiness penalty, for automatically grouping the required items into batches to solve the complex batch picking problem in the warehouse systems. Performance comparisons between the proposed multiple-GA approach and other two heuristic methods are given for various problems including small-, medium- and large-size batch picking problems. Based on the experiment result, the proposed multiple-GA approach is more effective in solving the batch picking problems in terms of solution quality.

Keyword: Batch picking; Warehouse; Genetic algorithms