

Chapter 11

Design of an Order Picking Reduce Module Using Bat Algorithm

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ABSTRACT

These days the human factor is key to improving order picking processes. For example, in a line of processes to replace different parts of equipment or devices, it is necessary to find the best route in each case to minimize the time consumed. One of the tools used to search for solutions are the metaheuristic methods that use probability to find the best solution in the required time. One of them is the “bat algorithm” that has had outstanding results since its appearance in 2010. This metaheuristic is based on how bats hunt, supported by their system of echolocation. It is one of the most recent metaheuristics and has proven to be more effective than other similar optimization algorithms in different processes. However, the algorithm was initially designed for addressing continuous problems. In this chapter, the authors present an adaptation of bat algorithms to solve a discrete problem: order picking.

INTRODUCTION

The *order picking* is the process of classifying and pulling items in a warehouse before delivering them to customers. The order picking operations are the most important processes in a warehouse. The cost of these operations is estimated to be as much as 50% of the total warehouse operating expense (de Koster, Le-Duc & Roodbergen, 2007). According to Cano, Correa-Espinal and Gómez-Montoya (2018), the

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ENDNOTES

¹ <https://la.mathworks.com/matlabcentral/fileexchange/37582-bat-algorithm-demo>

² <http://pentaho.dlpage.phi-integration.com/mondrian/mysql-foodmart-database>