

Abstract

Knapsack is an optimization problem of packing a number of objects which put into a container (knapsack) and consider values of objects in order to obtain optimum result. Packing optimization problem in this research is delivery of goods, where there are a number of items that must be transported from Jakarta to Bandung or Bandung to Jakarta in a timely manner taking into account space on the container. Therefore, it is required packing of goods design that can be determine which goods should be transported along with the optimal placement position to obtain a minimal amount of free space.

In this research, the algorithm that used for the problem is the new algorithm of Swarm Intelligence, the name is Cat Swarm Optimization, by designing a solution representation as a set of permutations of goods that can be taken and not taken with its placement position. CSO algorithm is influenced by two mode, Tracing and Seeking mode that make a change or evolution in the representation of solution.

From the simulation results, it can be concluded that CSO algorithm can be designed by making representations in accordance with the case or the solution of test data and combining the existing parameters to obtain optimal solutions in the form of a minimal amount of free space. Performance of CSO algorithm is better than PSO in packing cases to find a solution, although the time spent relatively longer but the solution is more optimal than before. It is very influential in the decision for the Company in determining which items should be transported in containers and not transported.

Keywords: knapsack, packing of goods, container, a minimal amount of free space, Swarm Intelligence, CSO, representation of solution, Tracing, Seeking, PSO