Abstract

Cutting Stock Problem (CSP) is a combinatorial optimization problem that is often found in industrial manufacturing with raw materials such as paper, glass, wood, plastic, cloth, leather, and metal. On completion (CSP), an industry that has such raw materials should be able to find a pattern to cut raw material to the results of the remaining ingredients in order of least to offset the cost of production and improve the efficiency of material usage. However, CSP is an optimization problem belonging to NP-Hard problems, which means that the calculation used is difficult and takes a long time so that methods are needed in order to suppress the time and get the optimal solution.

Krill Herd Algorithm (KHA) is a metaheuristics algorithms belonging to the Swarm Intellegent made to resolve difficult combinatorial optimization problems and is expected to produce an optimal solution. In KHA there are 3 (three) major motion krill (motion calculation) in the search for solutions, the induced motion, foraging motion, and physical diffusion. The third movement of krill represents the search for solutions towards global optimum and enlarge the search space solutions. In addition to improving the performance of KHA in the search for solutions is also used crossover genetic algorithm to find a better solution towards a local optimum after the motion calculation.

The results stated that the KHA can be applied in Cutting Stock Problem (CSP) and the average value optimization can yield more than 90% with the number of parameters influence cycles, the number of krill, and distance sensing for neighbors, as well as crossover genetic algorithm proved optimal performance in enhancing the value after motion calculation.

Keywords: Cutting Stock Problem, Ant Colony Optimization, order, stock