

ABSTRACT

Cutting stock problem (CSP) is a crucial problem in manufacturing industries. CSP is triggered by the lacks of natural resources and increasing market demand. So the industries strive to meet the demand even with a limited stock in order to compete in the globalized world. In addition, the utilization of not-optimal cutting stocks is going to harm the company. One of the solution which the marketers do to overcome the problem that occur is solving CSP problem.

This final project implements Artificial Immune System (AIS) Algorithm in solving the CSP cases. AIS is one of the meta-heuristic algorithms. The basic idea is to imitate how the human immune system works. The advantage of the algorithm is it (AIS) based on population and networks, and also the use of clonal selection and mutation method with correlation that can work in parallel on many solution at once. So, the AIS can perform global search and local search well.

The result showed that the AIS Algorithm is able to generate the solution to solve the CSP cases with optimization average over 85%. The solution that has been generated dependent to the result of the mutation and antibody random generation which produced by the death races. Generation of antibody randomly can be helpful in creating the solutions to save its local optimum. To increasing the optimization value, it is suggested to combine this algorithm with another local search algorithm like simulated annealing or tabu search.

Keyword: Cutting Stock Problem, Artificial Immune System, Clonal Selection, Stock, Order.