Abstract

Optimal route searching is one of the problems that commonly occurred in our life. One of the route searching cases is delivering some goods to some places with minimum cost. This delivery problem belongs to *Capacitated Vehicle Routing Problem with Time Windows* where there are a number of vehicles having same capacities which has to deliver some goods to a number of nodes in accordance with customer requests with time constraints between each node.

Optimal route has short total distance. To find an optimal route in CVRPTW, we can use the combination of of Differential Evolution and Genetic Algorithm as solving solution. Genetic Algorithm has some advantages in solving combinatorial problem with its crossover and mutation, while DE has some advantages in its direct mutation. By combining these advantages of these two algorithms, optimal solution is hoped to be gained.

Testing was done to get best parameters in order to yield nearly optimal solution. Pc, Pm, CRmin, and CRmax are significantly yielding nearly optimal solution, while F is not too significantly involved to the solution. Besides parameters' searching, its accuration could be seen from the comparison between combination of DE and GA to another two methods, Improved Ant Colony System- Simulated Annealing (IACS-SA) and Harmony Search (HS). From these comparison methods, the combination of DE and GA has the most total distance although its solutions are not too different from Harmony Search.

Keywords : optimal route searching, CVRPTW, Differential Evolution, Genetic Algorithm.