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Keyword: |



[TOP](#) > [Available Volumes](#) > [Table of Contents](#) > [Abstract](#)

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Optimization of Torch Movements of Welding and Cutting Using Ant Colony Method

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Summary: Though many methods are applied to solve the combinatorial optimization problem, there are many cases in which the solution can not be solved in practical computation time, even if the computer becomes more advanced. Recently "ant colony optimization method (ACO)" has been proposed for it as one of the meta-heuristic method. This research tried the ACO in ship production field. Firstly, ACO was applied and verified for the traveling salesman problem (TSP) to obtain the shortest path in many cities, as a representative combinatorial optimization problem. Next, on the basis of the result, ACO was applied to the problem in search of the optimum pathway of the torch of welding robot for the assembly of ship hull structure, and of NC plasma cutting machine of steel plate. As a result, it was confirmed that ACO is effective to solve the optimum path of the machines.

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