

## Abstract

In this study, an ant colony optimization algorithm for sizing optimization of structures is presented. Recently, a heuristic optimization technique called ant colony optimization (ACO) has been developed for combinatorial optimization problems. The ACO technique has been used in a few types of optimization problem with satisfactory results. Most of practical structural design optimization problems consider only sizing optimization, which is combinatorial optimization. In this study, the ACO technique, which has been designed for combinatorial optimization problems, is applied to solve structural sizing optimization problems. A greedy heuristic is also incorporated into the proposed algorithm in order to possibly improve the quality of the proposed ACO algorithm.

The validity of the algorithm in solving structural sizing optimization problems is investigated by solving sizing optimization problems of truss and frame structures. For comparison, some of the problems are also solved by a standard genetic algorithm (GA). The results obtained by the proposed algorithm are also compared with those from the literature. For the numerical examples shown in this study, the results from the proposed algorithm are found to be better than those results reported in the literature.