

Adaptive route optimization for mobile robot navigation using evolutionary algorithm

ABSTRACT

As technologies are advancing, demand for an intelligent mobile robot also increases. In autonomous robot design, the main problem faced by researchers is the path planning of mobile robot. Various kind of path planning algorithm was introduced in the past, but no algorithm has absolute superior towards the others algorithm. Classical methods like artificial potential field, grid search, and visual method have been easily overtaken by artificial intelligence due to its adaptability and ability to learn from the past mistakes or experience. For example, Ant Colony Optimization (ACO) is an optimization algorithm based on swarm intelligence which is widely used to solve path planning problem. However, the performance of ACO is highly dependent on the selection of its parameters. In this paper, the proposed adaptive ACO introduced two different ants, namely abnormal ant and random ant into the normal ACO to increase its global search ability and reduce the high convergence rate of ACO. Conventional ACO and adaptive ACO are compared in this paper and the results showed that adaptive ACO has better performance than conventional ACO in path planning.