Abstract

Global path planning on Mobile Robot is a path searching process to move from the first location to its destination in completely known workspace (environment) including the obstacles that exist in it.

This thesis design, implement and analyze the path planning method namely artificial neural network and genetic algorithm method (JST&AG method). In this method neural network with the Hopfield neural network model architecture called neural map is used as a media to represent environment condition. Genetic algorithm with novel encoding technique is used to search a path to the destination by using the information from the neural map. The path found was compared with the path found by visibility graph method on every equal sample cases. This comparison is about the total distance that has to be traveled by the path from each method, the time used by the path searching process and the total capacity of memory usage. The implementation is in form of simulation program. Test results showed the JST&AG method gives longer distance of the path found, but not for the time that is needed in the path searching process and the total capacity of memory usage which is better especially in all sample cases with getting more complicated workspace.

Key words: Hopfield Neural Network, Genetic Algorithm, Mobile Robot, *Neural Map*, *Visibility graph*, Global path planning.