

ABSTRACT

Significant research has been carried out in past to find the shortest path in network routing. Among them, the evolutionary algorithm approach is an area where work is carried out extensively. The Particle Swarm Optimization is an optimization algorithm in which a given problem is solved by individual particles working together. The Particle Swarm Optimization can be implemented in very small code using some of the mathematical operators, making it best for limited-memory and environment where there is computation constraint.

Genetic Algorithm considers a population of chromosomes that represent the possible paths between a source and destination. Genetic Algorithm involves three operators' selection, crossover and mutation, however it depends very much on the way the problem is encoded (for solving Travelling Salesman Problem, it depends how paths are encoded) on and which crossover and mutation methods used. In genetic Algorithm we have used Roulette wheel selection method for selecting chromosome from the existing population of chromosomes as, best chromosomes need to be selected depending upon their fitness value to generate new offspring. The result of Particle Swarm Optimization for solving Travelling Salesman Problem varies greatly by changing particle count (number of routes) as well as the maximum velocity (maximum velocity change allowed for each particle)

For solving Travelling Salesman Problem using Particle Swarm Optimization, we first choose some random paths (particles). Then we do some random arrangement in the existing path for each particle and find a new path and compare the new path to the previous existing path. If new path is better than previous then we replace the path to new path. We iteratively do this process number of times and finally get a path which is optimal in Travelling Salesman Problem.

Particle Swarm Optimization uses less number of functions as compared to Genetic Algorithm resulting into low function overhead. Moreover, the number of iterations to solve Travelling Salesman Problem using Particle Swarm Optimization is very less compared to Genetic Algorithm. Therefore, for solving Travelling Salesman Problem using Particle Swarm Optimization takes less computation time compared to Genetic Algorithm.

