

Report

Title: Efficient Path Module

Problem Definition:

To find effective path between all the selected cities using Travelling Salesman Algorithm. Genetic Algorithm is a search technique used in computing to find the optimal solution to a computational problem that maximizes or minimizes a particular function. Genetic Algorithm is used to solve the Travelling Salesman Problem where one has to find the shortest route among the cities from the origin. The Travelling Salesman Problem (TSP) is well known in the field of combinatorial optimization.

Motivation:

Calculating shortest distance in Network is one of the important network functions for QoS routing, MLPS Path selection, ATM networking and traffic networking engineering. In voice and video calling finding cheapest path is not an easy task. In order to find solution for this problem many researches and algorithms are designed. This project proposes two techniques which will reduce decentralization errors and provide shortest routing distance by developing faster algorithms. Providing shortest path is the important factor for successful design in QOS system. Simulator is used to test new techniques which show execution time efficiency in new system.

Genetic Algorithm is a search technique used in computing to find the optimal solution to a computational problem that maximizes or minimizes a particular function. Genetic Algorithm is used to solve the Travelling Salesman Problem where one has to find the shortest route among the cities from the origin. The Travelling Salesman Problem (TSP) is well known in the field of combinatorial optimization. Since it is an NP-complete problem, there is no efficient method to solve this problem and give the best result.

Many algorithms are used to solve travelling salesman problem. Some algorithms give optimal solution, but some other algorithms give the nearest optimal solution. The genetic algorithm is a heuristic method which is used to improve the solution space for the Travelling Salesman Problem. The genetic algorithm results in nearest optimal solution within a reasonable time. This project mainly focuses on the comparative study of different selection methods and crossover operators in genetic algorithm to solve Travelling Salesman Problem and finally report the results.

Methodology:

1. To select all the cities to be traversed on Webpage.
2. To create and analyze the close network of distances of each city from other.
3. To find the effective path between all the selected cities using Travelling Salesman Algorithm.
4. To update total path distance in kilometres and trace the path on Web Page.

Conclusion:

In this project, the three selection methods viz. Roulette wheel selection, Rank selection and Tournament selection methods and the three crossover methods viz. uniform crossover, one point crossover and two point crossover methods are implemented. A city map is drawn to show the cities travelled by the salesman. It also shows the route taken to visit all the cities. The results obtained are analyzed and tabulated for Roulette wheel selection, Rank selection and Tournament selection using Uniform crossover, One point crossover and Two point crossover methods. The best selection method was found to be Roulette wheel selection based on the analysis of fitness cost. The minimum fitness cost found is 0.00123 which is for Two point crossover method.