

Table of Contents

| | |
|--|-------|
| CHAPTER 1 INTRODUCTION | 1-6 |
| 1.1 Overview | 1 |
| 1.2 Particle Swarm Optimization (PSO)..... | 2 |
| 1.3 Genetic Algorithm..... | 3 |
| 1.4 Motivation..... | 5 |
| 1.5 Problem Statement and Objectives | 6 |
| 1.6 Organization of the Report..... | 7 |
| CHAPTER 2 LITERATURE SURVEY..... | 7-18 |
| 2.1 Travelling Salesman Problem | 7 |
| 2.1.1 Hamiltonian Path..... | 9 |
| 2.2 Genetic Algorithm | 9 |
| 2.2.1 Genetic Coding | 10 |
| 2.2.2 Fitness Function | 11 |
| 2.2.3 Reproduction Operator..... | 11 |
| 2.2.4 Sequential Constructive Crossover Operator (SCX)..... | 11 |
| 2.2.5 Offspring by Two Other Crossover Operators..... | 13 |
| 2.2.6 Survivor Selection..... | 14 |
| 2.2.7 Mutation Operator..... | 15 |
| 2.2.8 Control Parameters..... | 15 |
| 2.3 Particle Swarm Optimization (PSO) for Network Optimization | 15 |
| 2.3.1 Classical PSO..... | 16 |
| 2.3.2 Particle Swarm Optimization | 17 |
| 2.3.3 Basic PSO Algorithm..... | 18 |
| CHAPTER 3 PROPOSED METHOD..... | 19-36 |
| 3.1 Travelling Salesman Problem Using PSO | 19 |
| 3.1.1 How it works? | 20 |
| 3.1.2 Procedure | 21 |
| 3.1.3 Program Module for PSO applied on TSP..... | 26 |
| 3.2 Genetic Algorithm for Solving TSP..... | 31 |

| | |
|--|-------|
| 3.2.1 Implementation of Proposed Algorithm..... | 32 |
| 3.2.2 Initial Population..... | 34 |
| 3.2.3 Fitness Value..... | 35 |
| 3.2.4 Selection..... | 35 |
| 3.2.5 Roulette Wheel Selection Method | 36 |
| 3.2.6 Crossover | 36 |
| 3.2.7 Mutation..... | 36 |
| 3.2.8 Termination and Result..... | 36 |
| CHAPTER 4 EXPERIMENTAL RESULT AND ANALYSIS | 37-40 |
| 4.1 Result Obtained after Application of PSO on TSP | 37 |
| 4.2 Result Obtained after Application of GA on TSP..... | 39 |
| 4.2.1 Output on Running Genetic Algorithm on Travelling Salesman Problem | 40 |
| CHAPTER 5 CONCLUSION AND FUTURE WORK | 41 |
| 5.1 Conclusion | 41 |
| 5.2 Future Work..... | 41 |
| REFERENCES | 42-43 |