

GENETIC ALGORITHM IN CONCENTRATING EACH INDIVIDUAL GENETIC OPERATION ON A FUZZY SHORTEST PATH ALGORITHM

V. ANUSUYA¹ & R. KAVITHA²

¹P.G & Research, Department of Mathematics, Seethalakshmi Ramaswami College, Tiruchirappalli, Tamil Nadu, India

²Department of Mathematics, Chevalier T. Thomas Elizabeth College for Women, Chennai, Tamil Nadu, India

ABSTRACT

The shortest path problem is an important classical network optimization problem arising from many applications including robotics, networking, VLSI design and transportation. In most situations, however, some issues of a network-theoretic problem may be uncertain. In conventional shortest path problems, there always an assumption that one who takes the decision is certain about the parameters (distance, time etc.) between different possible vertices in the network $G=\{V,E\}$. But while considering the real time cases, the possibility of existence of uncertainty about the parameters between different nodes is always high. In those situations, the representation of parameters are given by fuzzy numbers and here we consider the generalized trapezoidal fuzzy numbers, can be dealt with the uncertainty using fuzzy set theory. In order to provide solution for the uncertain shortest path problem, we proposed Genetic Algorithm (GA) in concentrating up gradation of each individual genetic operation. The proposed model is implemented using MATLAB with the test network of 30 nodes and the results reports that the algorithm converges in a more reasonable time in comparison with conventional approaches.

KEYWORDS: Genetic Algorithm, Generalized Trapezoidal Fuzzy Number, Selection, Population Initialization, Crossover, Mutation, Ranking Function, Shortest Path Problem

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