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Mastering Complexity: Fuzzy Logic-Driven Optimization for Multi-Objective Transport Solutions Using LINGO Software

Zahoor Ahmad Ganie[1], Zahid Gulzar Khaki[2], Tanveer Ahmad Tarray[3], Gazala Salam[3,*], Eid Sadun Alotaibi[4], Nahaa Eid Alsubaie[5]

[1]*Department of Electrical Engineering, Islamic University of Science and Technology, Kashmir, India*
[2]*Department of Electronics and Communication Engineering, Islamic University of Science and Technology, Kashmir, India*
[3]*Department of Mathematical Sciences, Islamic University of Science and Technology, Kashmir, India*
[4]*Department of Mathematics and Statistics, Al-Khurma University College, Taif University, P.O. Box 11099,Taif 21944, Saudi Arabia*
[5]*Department of Mathematics and Statistics, AlKhurmah University College, Taif University, P.O. Box 11099, Taif 21944, Saudi Arabia*

Abstract. This work introduces a new method for transportation optimisation decision-making that utilizes LINGO software and fuzzy logic-powered optimisation. The main aim is to minimize variance in accounting for expenses. A sophisticated three-stage stratified random sampling procedure supported by randomised response mechanisms is utilized to achieve this. It primarily contributes a framework through which policymakers can make significant enhancement in the method of collecting data, especially for such cases in which privacy among respondents is very critical. It addresses challenges that face data collection involving sensitive issues and remains within data economy as well as integrity by bringing in fuzzy logic seamlessly in cooperation with randomized response technique.

1. Introduction

A staple of modern research, statistical inference provides flexible methods tailored to the specific needs of many investigations and contexts. Among the most popular is the combination of probabilistic frameworks with analytical and enumeration-based inference. This has been the basis of the modern approaches to statistics and is essentially required for reliable conclusions from empirical data. Although enumeration inference and analytical inference share the same goals, their assumptions and probability structures are quite different, and hence there is a need for creative

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