Fuzzy fractional stochastic transportation problem involving exponential distribution

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Abstract-

This paper deals with the solution of the fuzzy fractional transportation problem in which the parameters of the transportation problem, supply, and demand, are stochastic in nature and considered as a fuzzy random variable that follows the exponential distribution with fuzzy mean and fuzzy variance. In a fuzzy fractional objective function, the costs are taken as a triangular fuzzy number. As the parameters are imprecise in nature, the obtained objective value should be a fuzzy number. To obtain the fuzzy objective value, one has to find out its lower and upper bounds, which represent the level of uncertainty. The mathematical form of bounds is expressed by applying dual formulation and variable substitution. Also, for converting the fuzzy constraints into deterministic, the chance-constrained and fuzzy programming was applied. The values of the bounds, which are calculated at different values of λλ, the membership function of the objective value is approximated. A numerical example illustrates the considered methodology.

Index Terms- Duality · Exponential distribution · Fractional transportation problem · Fuzzy programming · Stochastic programming

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