

A Ranking Function Method for Solving Multi-Objective Linear Programming Problems with Imprecise Data

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Abstract

In many real-life problems we deal with a mathematical programming problem in the form of a Multi-Objective Linear Programming (MOLP) problem. In conventional mathematical programming the coefficients of the problem are usually determined by the experts as crisp values. But in reality in an imprecise and uncertain environment, it is an unrealistic assumption that the knowledge and representation of an expert are so precise. Here in order to develop a good mathematical programming methodology fuzzy approaches are frequently used to describe and treat imprecise and uncertain elements present in a real decision problem.

Several approaches have been proposed by different authors to solve fuzzy multi-objective linear programming (FMOLP) problems. Some of them used the concept of comparison of fuzzy numbers for solving of fuzzy multi-objective linear programming problem [1]. One of the most convenient of these methods is based on the concept of comparison of fuzzy numbers by using some ranking functions [2].

In this presentation, we focus on multi objective linear programming with fuzzy coefficient. By considering the general linear ranking function, we transform the problem to a classical multi-objective linear programming problem.

We give some necessary concepts of fuzzy set theory and ranking functions and a review of the multi-objective linear programming problems with crisp parameters and the definition of the solution concepts in MOLP. Solving FMOLP is explained and finally illustrated by an example.

Keywords. Multi-objective linear programming, fuzzy number, imprecise data, ranking function.

References

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