International J. of Math. Sci. & Engg. Appls. (IJMSEA)
ISSN 0973-9424, Vol. 7 No. I (January, 2013), pp. 307-322

INTERVAL LINEAR PROGRAMMING USING FUZZY RULE BASED SYSTEMS-A NEW APPROACH

AK. BIMOLNANDA SINGH[1] AND TH. BIREN SINGH[2]

[1]Dept. of Maths. Manipur University, Imphal-795003, Manipur,
[2]Oriental College, Imphal-795001, Manipur, India

Abstract

In the paper, we begin with a standard form of linear programming problem with interval coefficients. The interval coefficients are uniformly subdivided into finite number of subintervals. Each subinterval is fuzzified into a triangular fuzzy number(TFN) corresponding to a variable in the subinterval by a fuzzy quantization function. Through an associated evaluation value of each TFN, the fuzzy non-dominated degree is calculated by using a fuzzy preference relation. A fuzzy rule-based system is developed to calculate fuzzy output corresponding to the fuzzy non-dominated degree. The fuzzy outputs are aggregated and then, a defuzzification method is applied to obtain the single real value of the interval. Finally, the interval linear programming is transformed into a crisp equivalent linear programming problem. An example is illustrated to show the efficiency of the method.

Key Words : *Linear programming, Interval coefficient, Fuzzy quantization function, Triangular fuzzy number, Fuzzy preference relation, Fuzzy rule-based system, Defuzzification.*

2010 AMS Subject Classification : 90C05.

© http: //www.ascent-journals.com