

# Application of fuzzy TOPSIS approach with linguistic expert assessments

*Irina Khutsishvili*

[irina.khutsishvili@tsu.ge](mailto:irina.khutsishvili@tsu.ge)

Department of Computer Sciences  
Iv.Javakishvili Tbilisi State University  
13, University st., 0186, Tbilisi, Georgia

This work develops an evaluation methodology for multi-attribute group decision making problem based on the TOPSIS (Technique for Order Performance by Similarity to Ideal Solution) method in fuzzy environment. A more realistic approach may be using linguistic expert assessments (linguistic variables) instead of numerical values. In the proposed methodology both the values and weights of the attributes take the form of linguistic terms, given by all decision makers. Then these linguistic terms are expressed in triangular fuzzy numbers. According to the concept of the TOPSIS, a closeness coefficient is defined to determine the ranking order of all alternatives by calculating the distances as to the fuzzy positive-ideal solution (FPIS), as well as to the fuzzy negative-ideal solution (FNIS). An example is shown to explain the procedure of the proposed methodology.

**Keywords:** Multiple-attribute group decision making, TOPSIS approach, linguistic variable, triangular fuzzy number.