

UNIVERSITI TEKNOLOGI MARA

**RANKING FUZZY NUMBERS USING AREA
DOMINANCE METHOD**

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ABSTRACT

Ranking fuzzy numbers is particularly important in decision making. Various methods of ranking fuzzy numbers have been proposed and one of them is area dominance method by Tseng and Klein. Area dominance based method ranks all form of fuzzy numbers such as trapezoidal, triangular, s-curve and Gaussian fuzzy numbers. However, it is unable to rank non-normal fuzzy numbers or two overlapping fuzzy numbers that have the same midpoint and different symmetric spreads. This research proposes a method that utilizes area dominance approach with an introduction of upper dominance concept in addition to the existing left and right dominance. The proposed method also incorporated the spread factor of fuzzy numbers in the ranking method. Furthermore, this method has also overcome the shortcomings of area dominance method and is able to rank generalised fuzzy numbers. The consistency of the ranking order of the proposed method will be investigated by applying the proposed method in ranking several sets of combination of fuzzy numbers. Three established decision-making problems are utilized to investigate the proposed method consistency of ranking order. For implementation purposes, this proposed method is applied on a decision-making on ranking calculus textbooks.

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