

MULTI-CRITERIA DECISION MAKING UNDER HESITANT FUZZY ENVIRONMENT

A. UMAMAHESWARI¹ & P. KUMARI²

¹Associate Professor, Department of Mathematics, Quaid-E-Millath Government College for Women,
Chennai, Tamil Nadu, India

²Assistant Professor, Department of Mathematics, D. G. Vaishnav College,
Chennai, Tamil Nadu, India

ABSTRACT

Dealing with uncertainty has always been a challenging problem and different tools have been proposed to deal with it. Recently, a new model that is based on hesitant fuzzy sets has been presented to manage situations in which experts hesitate between several values to assess an alternative. Hesitant fuzzy set is a very useful technique in situations where there are some difficulties in determining the membership of an element to a set. Most aggregation methods are under the assumption that the criteria are independent. However, in real decision making problems, there exists correlation between criteria. The Heronian mean (HM) can capture the interrelationship between input arguments. Combining the HMs and hesitant fuzzy sets, some new hesitant fuzzy Heronian means (HFHMs) are explored. In this paper, multi-criteria decision making problems where the criteria are correlative under hesitant fuzzy environment are investigated. First, we propose the Hesitant Fuzzy Heronian Mean (HFHM). Some of its desirable properties and special cases of HFHM are studied in detail. Furthermore, the HFHM is extended to the generalized Hesitant Fuzzy Heronian Mean (GHFHM). The generalized weighted Hesitant Fuzzy Heronian Mean (GWHFHM) is developed to give due weightage to the arguments. Finally, a real life situation involving the portfolio management planning is provided to illustrate the usefulness of developed HFHM operator.

KEYWORDS: Hesitant Fuzzy Set, Heronian Mean, Hesitant Fuzzy Heronian Mean