

Accepted Manuscript

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PII: S0360-8352(18)30490-X
DOI: <https://doi.org/10.1016/j.cie.2018.10.020>
Reference: CAIE 5459

To appear in: *Computers & Industrial Engineering*

Received Date: 13 March 2018
Revised Date: 14 September 2018
Accepted Date: 8 October 2018

Please cite this article as: Gou, X., Xu, Z., Liao, H., Herrera, F., Multiple Criteria Decision Making based on Distance and Similarity Measures under Double Hierarchy Hesitant Fuzzy Linguistic environment, *Computers & Industrial Engineering* (2018), doi: <https://doi.org/10.1016/j.cie.2018.10.020>

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Multiple Criteria Decision Making based on Distance and Similarity Measures under Double Hierarchy Hesitant Fuzzy Linguistic environment

Xunjie Gou^{1,2}, Zeshui Xu^{1,*}, Huchang Liao^{1,2}, Francisco Herrera^{2,3}

¹Business School, Sichuan University, Chengdu 610064, China

²Department of Computer Science and Artificial Intelligence, University of Granada, E-18071 Granada, Spain

³Faculty of Computing and Information Technology, King Abdulaziz University, Jeddah, Saudi Arabia

Abstract

The hesitant fuzzy linguistic term set (HFLTTS) has been studied from different research directions. To describe the complicated linguistic information more accurately and reasonably, the double hierarchy linguistic term set (double hierarchy LTS) and double hierarchy hesitant fuzzy linguistic term set (double hierarchy HFLTTS) were defined. Considering that the distance and similarity measures are the basis of decision making with double hierarchy hesitant fuzzy linguistic information, this paper proposes some distance and similarity measures of double hierarchy hesitant fuzzy linguistic elements (DHFLEs) and double hierarchy HFLTTSs from different angles. We develop a decision-making method to deal with multiple criteria decision making (MCDM) problems on the basis of these distance and similarity measures. Finally, we apply this method to deal with a practical MCDM problem about Sichuan liquor brand assessment.

Keywords: Double hierarchy hesitant fuzzy linguistic term set; Distance measures; Similarity measures; Multiple criteria decision making; Sichuan liquor brand assessment

* Corresponding Author. Emails: X.J. Gou (gouxunjie@qq.com); Z.S. Xu (xuzeshui@263.net); H.C. Liao (liaohuchang@163.com); F. Herrera (herrera@decsai.ugr.es).

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