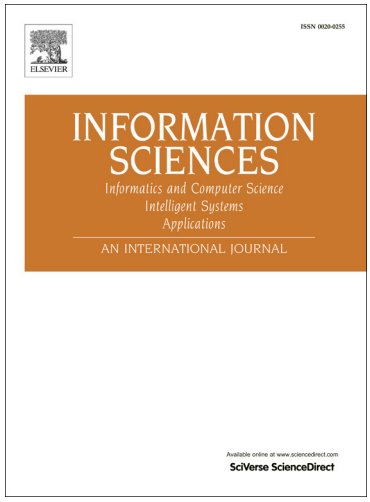

Some new entropy measures for interval-valued intuitionistic fuzzy sets based on distances and their relationships with similarity and inclusion measures

Qiansheng Zhang, Hongyan Xing, Fuchun Liu, Jun Ye, Pan Tang

PII: S0020-0255(14)00640-9
DOI: http://dx.doi.org/10.1016/j.ins.2014.06.012
Reference: INS 10938

To appear in: *Information Sciences*

Received Date: 12 June 2012
Revised Date: 30 May 2014
Accepted Date: 5 June 2014

Please cite this article as: Q. Zhang, H. Xing, F. Liu, J. Ye, P. Tang, Some new entropy measures for interval-valued intuitionistic fuzzy sets based on distances and their relationships with similarity and inclusion measures, *Information Sciences* (2014), doi: http://dx.doi.org/10.1016/j.ins.2014.06.012

Some new entropy measures for interval-valued intuitionistic fuzzy sets based on distances and their relationships with similarity and inclusion measures

Qiansheng Zhang [1,*], Hongyan Xing[b], Fuchun Liu[c], Jun Ye[d], Pan Tang[e]

[a]*School of Informatics, Guangdong University of Foreign Studies, Guangzhou 510420,P.R. China*
[b]*Faculty of Applied Mathematics, Guangdong University of Technology, Guangzhou 510006,P.R. China*
[c]*Faculty of Computer, Guangdong University of Technology, Guangzhou 510006, China*
[d]*Department of Electrical and Information Engineering, Shaoxing University, Shaoxing 312000, P.R. China*
[e]*Faculty of Emergency Management, Jinan University, Guangzhou 510632, P.R. China*

Abstract

A new axiomatical definition of entropy measure for interval-valued intuitionistic fuzzy set based on distance is firstly proposed, which is consistent with the axiomatical definition of fuzzy entropy introduced by De Luca and Termini. Then, we present some new entropy measures for interval-valued intuitionistic fuzzy sets (IvIFSs) and discuss their relationships with similarity measures and inclusion measures for IvIFSs. Also, we prove that the presented entropy measures, the similarity measures and the inclusion measures of IvIFSs can be transformed into each other by their axiomatical definitions. Finally, several numerical examples are given to demonstrate that the proposed new entropy measures for IvIFSs are more intelligible in representing the degree of fuzziness of IvIFSs than the existing ones.

Keywords:
Interval-valued intuitionistic fuzzy set, Entropy measure, Distance, Similarity, Inclusion measure

*Corresponding author.
Email address: zhqiansh010126.com (Qiansheng Zhang)