

Complex multi-fuzzy soft expert set and its application

Abstract

We introduce the concept of complex multi-fuzzy soft expert set (CMFSES) for which the range of its membership functions are represented in terms of complex numbers. CMFSES has the ability to realize more range of values while handling uncertainty of data that is captured by the amplitude terms and phase terms of the complex numbers, simultaneously. It also has a mechanism to incorporate the adequate parameterization capabilities and the opinions of all experts regarding the validity of the information at hand in one mode, thus making it quite appropriate for use in decision-making problems, whereas the time factor plays a key role in determining the final decision. Some operations related to this new concept have been defined, such as complement, union and intersection, AND and OR operations. We also investigate structural properties of these operations based on this concept. An algorithm is developed in complex multi-fuzzy expert soft set setting for a decision making method. Finally an illustrative example is employed to show that it can be successfully applied to problems that contain uncertainties. In addition, a comparison between CMFSES and other existing methods is made to reveal the dominance of our proposed method.

Keywords: Complex multi-fuzzy set, multi-fuzzy set, fuzzy soft expert set, decision making.

Al-Qudah, Y. and Hassan, N. 2019. Complex multi-fuzzy soft expert set and its application. *International Journal of Mathematics and Computer Science* 14(1): 149–176.

<http://ijmcs.future-in-tech.net/14.1/R-Hassan2.pdf>