

# Fuzzy Logic as the Basis for General Theory of Similarity, Correlation and Association Measures

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**Abstract.** Last years it is significantly increased the number of works on similarity, correlation and association measures as descriptive measures of relationship, interestingness, dependency, resemblance etc. in data mining, data analysis, classification and machine learning. The fuzzy logic (in wide sense) can serve as the basis for general theory of similarity, correlation and association measures. This talk presents outline of this theory based on formalisms introduced by Lotfi Zadeh and developed in fuzzy logic. The general methods of construction of similarity and correlation measures are surveyed and new methods are discussed. The methods of 3D visualization of some families of similarity and correlation measures are presented.



**Ildar Batyrshin** graduated from the Moscow Physical-Technical Institute, Faculty of Control and Applied Mathematics. He received PhD and Dr. Sc. (habilitation) degrees in 1983 and 1996. He was with the Department of Informatics and Applied Mathematics of Kazan State Technological University, Russia as professor and the Department Head. He was also as a leading researcher with the Institute of Problems of Informatics of Academy of Sciences of Tatarstan, Russia. Since 2003 he was with Research Program of Applied Mathematics and Computations of Mexican Petroleum Institute as Leading Researcher and Head of the Project. Since 2014 he is with the Center for Computing Research of Mexican National Polytechnic Institute (CIC IPN) as a Titular Professor C.

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