Dissimilarity Measure for Comparison of Fuzzified Instances and its Application in a Fuzzy Rule-Based System for Heart Failure Domain

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Abstract

The aim of this study is to improve a fuzzy rule based system that helps to manage heart failure patients in home telemonitoring. The system is intended to give notifications to a decision-making support system and medical experts when there is a possibility of death for a telemonitored patient. The improvement consists in inclusion of a formulated dissimilarity measure into the algorithm for creation of fuzzy rules on the basis of collected patient data. The dissimilarity measure compares two instances which have defined linguistic variables and known membership degrees for particular linguistic terms and gives a value between 0 and 1 inclusive. It takes the order of the membership degrees for a particular linguistic variable into consideration and makes use of the Euclidian distance in one dimension. Experimental results show that the introduced dissimilarity measure improves the accuracy and interpretability of the fuzzy rule-based system. Its accuracy results are also promising in comparison to many other classification algorithms.

Keywords

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