HYBRID KERNEL FUZZY CLUSTERING WITH FEED LION NEURAL NETWORK FOR MISSING DATA IMPUTATION AND CLASSIFICATION

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ABSTRACT

A common issue in many practical applications associated with pattern classification is data incomplete or missing data due to various reasons that differ based on the applications. Missing data imputation is a promising approach used to handle this issue, which fills the missing attributes with estimated values following several techniques. This paper proposes a new strategy for data imputation and classification using a hybrid prediction model that combines Hybrid Kernel Fuzzy Clustering (HKFC) and Feed Lion Neural Network (FLNN). FLNN considers the missing attributes as the class attributes to predict the missing data, which will also be computed using HKFC and finally, the combined effect of these two approaches provides the missing data. FLNN is designed for the classification by modifying Levenberg-Marquardt (LM) - based feed forward neural network with the incorporation of LOA and thus, selects the weights optimally. The experiment is carried out using three data sets from UCI, based on two metrics, Mean Squared Error (MSE) and accuracy. The performance of the proposed method, HKFC+FLNN is compared with three techniques, FC+FLNN, FC+KNN and K-Means+KNN, where HKFC+FLNN attained MSE by 0.0344, 0.0048, 0.2754, and classification accuracy of 0.8022, 0.95 and 0.9741, for heart disease, iris, and wine datasets, respectively.

KEYWORDS: Data Incompleteness, Missing Data Imputation, FCM, Classification & Neural Network

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