

Abstract

Cardiac disorders detection approach based on local transfer function classifier

Truly, heart is successor to the brain in being the most significant vital organ in the body of a human. Heart, being a magnificent pump, has its performance orchestrated via a group of valves and highly sophisticated neural control. While the kinetics of the heart is accompanied by sound production, sound waves produced, by the heart, are reliable diagnostic tools to check heart activity. Chronologically, several data sets have been put forward to sneak on the heart performance and lead to medical intervention whenever necessary. The heart sounds data set, utilized in this paper, provides researchers with abundance of sound signals that was classified using different classification algorithms decision tree, rotation forest, random forest are few to mention. This paper proposes an approach based on local transfer function classifier as a new model of neural networks for heart valve diseases detection. In order to achieve this objective, and to increase the efficiency of the predication model, boolean reasoning discretization algorithm is introduced to discretize the heart signal data set, then the rough set reduction technique is applied to find all reducts of the data which contains the minimal subset of attributes that are associated with a class label for classification. Then, the rough sets dependency rules are generated directly from all generated reducts. Rough confusion matrix is used to evaluate the performance of the predicted reducts and classes. Finally, a local transfer function classifier was employed to evaluate the ability of the reduct descriptors for discrimination whether they represent healthy unhealthy. The experimental results obtained, show that the overall accuracy offered by the employed local transfer function classifier was high compared with other techniques including decision table, rotation forest, random forest, and NBtree.