Certain Investigation on detection of Cardiovascular Disease using Hybrid Learning Approaches

Scholar: **Saran Kumar A** **Guide: Dr. R.Rekha**

For the past few decades, cardiovascular disease has shown a binding impact on the country’s mortality rate. The prediction of cardiovascular disease is more challenging during the process of clinical data analysis. The emergence of Machine Learning approaches paved the way to predict the disease and determining the consequences of the disease in the earlier stage to help the physicians during complex decision-making. The initial phase of the research employs a baseline classifier and an ensemble classifier model to predict heart disease. The features of cardiovascular disease (CVD) are predicted using Linear Support Vector Feature Measure () as it considers the diverse combination of features to make a better classification process. for classification purposes and the construction of the stacking model. The model's overall performance is optimized with the non-linear Hawks Optimizer (HO) model to acquire the optimal and global solution. Class imbalance issues are solved by use of chaotic maps and non-linear adjusting parameter among the exploitation and the exploration stages of HO. The HO model gives 97% accuracy, 98% precision, 96% sensitivity, 97% F-measure, 94% MCC, 3.89% FPR, 2.15% FNR and 97% TNR respectively. In the third phase, an effective method for prediction is suggested for the risk of cardiovascular disease (CVD) to train the deep neural networks on the well-defined training dataset. The irregular subset is included in most real datasets having the greater variance over many data, and the datasets are unaware of the predictive models. A pre-trained convolutional neural network (VGG16) with Capsule Neural Networks (CapsNet) is used to detect CVD with unbalanced data sets. The accuracy of the proposed model is enhanced by using the Gaussian optimization (GO) process by tuning the hyper-parameters of the Capsule neural networks. The suggested CapsNet enhances the prediction of heart disease by giving 94% classification accuracy.