ABSTRACT

Cardiac Disease is the predominant source of global death mainly due to its hidden symptoms and late diagnosis. People with Coronary Vascular Disease (CVD) and other diseases like hypertension and hyperlipidemia require very early detection for appropriate treatment. Hence, this research proposed a hybrid technique for heart disease diagnosis. The study's main contribution is to overcome the existing limitations of Ant Lion, Crow Search, and Improved Genetic Algorithm and hybridize the algorithm for a compelling feature selection, thereby improving the classification performance of the Support Vector Machine (SVM) classifier. The motivation of this research is to improve the feature selection method with the optimization of features. The proposed architecture uses the Ant Lion optimizer with the practical determination of the elite position. The crow search optimization utilizes the phenomenon of position and memory of each crow to evaluate objective function. The improved genetic algorithm processed the inputs for a compelling feature selection. Now the proposed system, which is hybridized successfully, extracts the optimized features. The SVM classifier classifies these features. The performance analysis was performed with two datasets. Dataset 1 is used to determine the efficiency of the proposed system, and dataset 2 is utilized to estimate the proposed method, followed by a detailed comparative analysis with the existing system.

Further cross-validation of the sample with a varied range of testing percentages has also been accomplished. Apart from that, inter combination performance of feature selection among the three utilized algorithms was also compared. In comparison to existing approaches, the proposed method has the highest accuracy of 97.23%.

Heart disease is one of the common diseases all over the world. In this, the heart disease classification is performed by combining the image processing and data mining process. The image process part is used to extract the features

from the cardiogram images, and the data mining helps for feature reduction and classification process. The first part of the work is the image process to extract the information from it. The steps in image processing are pre-processing and feature extraction. The pre-processing step used in this is an image conversion from int16 to unit8 for the image's best-viewing quality and process. The feature extraction steps use the basic grayscale properties to extract the texture information of the image, namely, GLCM properties, Skewness, Energy, Entropy and Kurtosis. After the feature extraction process, the data reduction is performed with the help of Moth flame optimization by reducing the ten features to the most dominant single feature using the fitness function. The fitness function used in this is reducing the error rate of the classifier. The reduced feature is trained using the generalized regression neural network. The network is tested, and it is evaluated using accuracy, sensitivity, and specificity. The whole process is tested on the dataset from the ACDC challenge in matlab2018a under the windows environment.