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A DEEP CONVOLUTIONAL NEURAL NETWORK FRAMEWORK FOR DETECTING DEPRESSION USING EEGD10

PUSHPA JOSHI[1], PRIYA PRANAVA SAIJA[2], MRUNAL SHRINIWAS DAKHARE[3], BALE SOUMYA[4], ARE NITHIN[5]

[1]Assistant professor, Dept. of CSE, Malla Reddy College of Engineering HYDERABAD.

[2,3,4,5]UG Students, Department of CSE, Malla Reddy College of Engineering HYDERABAD.

ABSTRACT:

Health diseases are increasing day by day due to life style and hereditary. In this aspect, heart disease is the most important cause of demise in the human kind over past few years. The objective of this paper is to predict the Heart Disease by applying Artificial Neural Network using swarm Intelligence algorithm. Swarm intelligence (SI) is relatively new interdisciplinary field of research. The Swarm-based algorithms have recently emerged as a family of nature-inspired, population-based algorithms that are capable of producing low cost, fast, and robust solutions to several complex problems. There are so many swarm intelligence algorithms for optimization like Group Search Optimization (GSO), Artificial Bee Colony (ABC), Ant Colony Optimization (ACO) and Particle Swarm Optimization (PSO) etc. This paper proposes Particle Swarm Optimization (PSO) is the most population Intelligence Algorithm and has good performance on optimization. This paper aims to predict the heart disease using Feed forward of Artificial Neural Network (ANN) to classifying patient as diseased and non-diseased. We have evaluated our new classification approach via the well known data sets .

Keywords: ANN, PSO, ABC, ACO, GSO, SI.

1. INTRODUCTION

While comparing the Data Mining with Artificial Neural Networks the performance is Highest, Computational Speed is fast, and Complexity Level is high in Artificial Neutral Networks (ANNs) [1]. Artificial neural networks (ANNs) are networks of simple processing elements (called „neurons“) operating on their local data and communicating with other elements [2]. ANN have been successfully solved many complex real-world problem such as predicting future trends based on the huge historical data of an organization. ANN have been successfully

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implemented in all engineering fields such as biological modeling, decision and control, health and medicine, engineering and manufacturing, marketing, ocean exploration and so on [3]. The purpose of this paper is to present swarm intelligent technique-Particle swarm optimization (PSO) with feed forward neural network that can be used to provide solutions to the prediction of heart disease. Bonabeau defined Swarm Intelligence as "The emergent collective intelligence of groups of simple agents" [4]. A swarm is a large number of homogenous, simple agents interacting locally among themselves, and their environment, with no central control to allow a global interesting behavior to emerge. Swarm-based algorithms have recently emerged as a family of nature-inspired, population-based algorithms that are capable of producing low cost, fast, and robust solutions to several complex problems [5]. Swarm Intelligence (SI) can therefore be defined as a relatively new branch of Artificial Intelligence that is used to model the collective behavior of social swarms in nature, such as ant colonies, honeybees, and bird flocks. Although these agents (insects or swarm individuals) are relatively unsophisticated with limited capabilities on their own, they are interacting together with certain behavioral patterns to cooperatively achieve tasks necessary for their survival. The social interactions among swarm individuals can be either direct or indirect [6].

The typical swarm intelligence system has the following properties: responding to students' frustration by creating and displaying personalized motivational messages as feedback. We implemented and evaluated our approach to responding to students' frustration in a largescale commercial math ITS called Mindspark [15]. We integrated the theory-driven model [13] in Mindspark, to detect students' frustration in real-time as they work with the ITS. To respond to students' frustration, we developed motivational messages based on the identified reasons for frustration and data from Mindspark log files. We used attribution theory [16], praising student's effort [17] and showing empathy [4], to create and display the motivational messages. Further, we developed an algorithm to show the motivational messages whenever the student is detected as frustrated. To evaluate our approach, we analyzed the number of frustration instances per session after implementing the algorithm. The instances of frustration showed a statistically significant reduction ($p < 0.05$), after displaying the motivational messages.

LITERATURE SURVEY

There is number of works has been done related to disease prediction systems using

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different machine learning algorithms in medical Centre's.

Senthil Kumar Mohan et al,[1] proposed Effective Heart Disease Prediction Using Hybrid Machine Learning Techniques in which strategy that objective is to finding critical includes by applying Machine Learning bringing about improving the exactness in the expectation of cardiovascular malady. The expectation model is created with various blends of highlights and a few known arrangement strategies. We produce an improved exhibition level with a precision level of 88.7% through the prediction model for heart disease with hybrid random forest with a linear model (HRFLM) they likewise educated about Diverse data mining approaches and expectation techniques, Such as, KNN, LR, SVM, NN, and Vote have been fairly famous of late to distinguish and predict heart disease.

Sonam Nikhar et al [2] has built up the paper titled as Prediction of Heart Disease Using Machine Learning Algorithms by This exploration plans to give a point by point portrayal of Naïve Bayes and decision tree classifier that are applied in our examination especially in the prediction of Heart Disease. Some analysis has been led to think about the execution of prescient data mining strategy on the equivalent dataset, and the result uncovers that Decision Tree beats over Bayesian classification system.

Aditi Gavhane, Gouthami Kokkula, Isha Pandya, Prof. Kailas Devadkar (PhD), [3] Prediction of Heart Disease Using Machine Learning", In this paper proposed system they used the neural network algorithm multi-layer perceptron (MLP) to train and test the dataset. In this algorithm there will be multiple layers like one for input, second for output and one or more layers are hidden layers between these two input and output layers. Each node in input layer is connected to output nodes through these hidden layers. This connection is assigned with some weights. There is another identity input called bias which is with weight b, which added to node to balance the perceptron. The connection between the nodes can be feedforwarded or feedback based on the requirement.

Abhay Kishore et al,[4] developed Heart Attack Prediction Using Deep Learning in which This paper proposes a heart attack prediction system using Deep learning procedures, explicitly Recurrent Neural System to predict the probable prospects of heart related infections of the patient. Recurrent Neural Network is a very ground-breaking characterization calculation that utilizes Deep Learning approach in Artificial Neural Network. The paper talks about in

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detail the significant modules of the framework alongside the related hypothesis. The proposed model deep learning and data mining to give the precise outcomes least blunders. This paper gives a bearing and point of reference for the advancement of another type of heart attack prediction platform. Prediction stage.

Existing system:

In the current competitive world, we require an efficient technique to summarize, analyse, present and maintain large datasets using data mining. This requires the knowledge of all data mining techniques in order to choose the best for desired datasets and these data mining techniques can answer the questions that traditionally were too time consuming to resolve. Research has shown that, data doubles every three years.

PROPOSED SCHEME

In this project student want to detect heart disease from dataset using Bio Inspired 4 features optimizing algorithms such as Genetic Algorithm, Bat, Bee and ACO. Here ACO algorithm is design in python to solve Travelling Salesman Problem to find shortest path and it cannot be implemented with heart disease dataset, so I am implementing 3 algorithms called Genetic, Bat and Bee.

ADVANTAGES OF PROPOSED SYSTEM

Finally, the performance was evaluated in terms of accuracy, sensitivity and specificity and also compare to other well-known data sets, it has been observed that these results are one of the best results compared with the results obtained from related previous studies.

Explanation:

The results obtained after executing the implementation code is shown from Fig.1 to Fig.9. To run this project double click on 'run.bat' file to get below screen

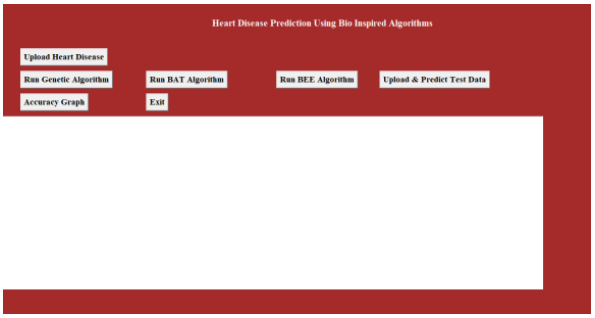

Fig.1. Home page.

In above screen click on 'Upload Heart Disease' button and upload heart disease dataset. See below screen

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Fig.2. Run Genetic Algorithm.

Now click on 'Run Genetic Algorithm' button to run genetic algorithm on dataset and to get its accuracy details. While running this algorithm u can see black console to see feature selection process, while running it will open empty windows, u just close all those empty windows except current window

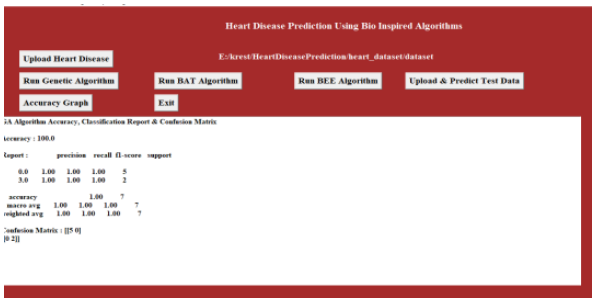

Fig.3. Genetic Algorithm Accuracy.

In above screen for GA accuracy, precision and recall we got 100% result. Now click on 'Run Bat' algorithm button to get its accuracy.

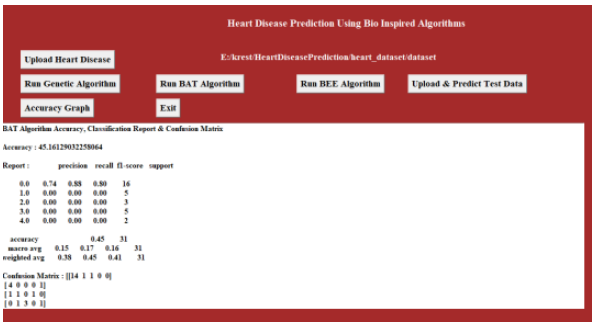

Fig.4. BAT Accuracy.

In above screen for BAT we got 45% accuracy, now click on 'Run BEE Algorithm' button to get BEE accuracy.

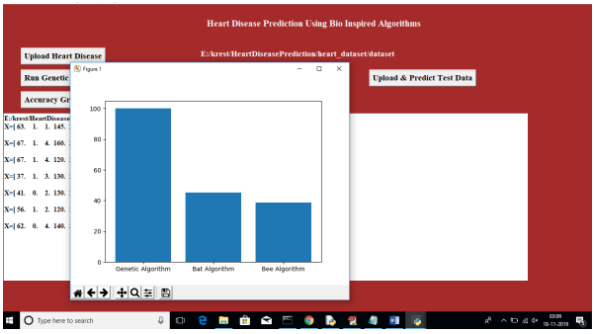

Fig.5. Accuracy Graph.

In above graph x-axis represents Algorithm Name and y-axis represents accuracy of those algorithms.

CONCLUSION

In this work we use the PSO technique as a training algorithm for ANN to predict the heart diseases. After applying the PSO, We found that compare to different diseases was able to improve the accuracy, sensitivity and specificity. Based on these results it shows

that the proposed system is able to show good performance in the category of optimization.

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