Project Description

DATE	15-10-2022
TEAM ID	PNT2022TMID05467
PROJECT NAME	Visualizing And Predicting Heart Diseases With An Interactive Dash Board

Abstract - This paper describes various methods of data mining, big data and machine learning models for predicting the heart disease. Data mining and machine learning plays an important role in building an important model for medical system to predict heart disease or cardiovascular disease. Medical experts can help the patients by detecting the cardiovascular disease before occurring. Now-a-days heart disease is one of the most significant causes of fatality. The prediction of heart disease is a critical challenge in the clinical area. But time to time, several techniques are discovered to predict the heart disease in data mining. In this survey paper, many techniques were described for predicting the heart disease. Key Words: Data mining, prediction, cardiovascular disease, heart disease, machine learning

1. INTRODUCTION

Heart disease defines a range of conditions that affect human heart. The name "heart disease" is often used commonly with the name "cardiovascular disease". Heart disease is a term that allow to a large number of medical circumstances related to heart. These medical circumstances characterize the irregular health condition that directly affects the heart and all its parts. Heart disease generally allows to some conditions that involve narrowed or blocked blood vessels which can lead to a heart attack, stroke or chest pain. Other heart conditions, such as those that affect your heart's muscle, valves or rhythm, also are considered forms of heart disease .There are various types of cardiovascular disease. The most similar types are heart failure (HF) and Coronary Artery Disease (CAD). The main root cause of heart failure (HF) is occur due to the blockade or narrowing down of coronary arteries. Coronary arteries also supply blood to the heart. Data mining is a non trivial extraction of implicit, previously unknown potential useful information called as knowledge from the medical data using complex algorithms. Big data (BD) can be referred as huge record of information set. Big Data and Data Mining are two

various things. The task carried out by these two methods are similar focusing on collecting the huge amount of data, handling them and preparing report on the data by taking out the information which is knowledgeable. Data Mining is basically an activity of observing the patterns in the data which is relevant and with particular information by using Big Data. The useful patterns with hidden patterns, unknown correlations are analytically handled for making knowledgeable decision through this Big Data analytics process.

2. LITERATURE SURVEY

Bo Jin, Chao Che et al. (2018) proposed a "Predicting the Risk of Heart Failure With EHR Sequential Data Modeling" model designed by applying neural network. This paper used the electronic health record (EHR) data from real-world datasets related to congestive heart disease to perform the experiment and predict the heart disease before itself. We tend to used one-hot encryption and word vectors to model the diagnosing events and foretold coronary failure events victimization the essential principles of an extended memory network model. By analyzing the results, we tend to reveal the importance of respecting the sequential nature of clinical records [1]. Aakash Chauhan et al. (2018) presented "Heart Disease Prediction using Evolutionary Rule Learning". This study eliminates the manual task that additionally helps in extracting the information (data) directly from the electronic records. To generate strong association rules, we have applied frequent pattern growth association mining on patient's dataset. This will facilitate (help) in decreasing the amount of services and shown that overwhelming majority of the rules helps within the best prediction of coronary sickness [2]. Ashir Javeed, Shijie Zhou et al. (2017) designed "An Intelligent Learning System based on Random Search Algorithm and Optimized Random Forest Model for Improved Heart Disease Detection". This paper uses random search algorithm (RSA) for factor selection and random forest model for diagnosing the cardiovascular disease. This model is principally optimized for using grid search algorithmic program. Two forms of experiments are used for cardiovascular disease prediction. In the first form, only random forest model is developed and within the second experiment the proposed Random Search Algorithm based random forest model is developed. This methodology is efficient and less complex than conventional random forest model. Comparing to conventional random forest it produces 3.3% higher accuracy. The proposed learning system can help the physicians to improve the quality of heart failure detection [3]. "Effective Heart Disease Prediction Using Hybrid Machine Learning

Techniques" proposed by Senthilkumar Mohan, Chandrasegar Thirumalai et al. (2019) was efficient technique using hybrid machine learning methodology. The hybrid approach is combination of random forest and linear method. The dataset and subsets of attributes were collected for prediction. The subset of some attributes were chosen from the pre-processed knowledge(data) set of cardiovascular disease .After prep-processing , the hybrid techniques were applied and disgnosis the cardiovascular disease [4]. K.Prasanna Lakshmi, Dr. C.R.K.Reddy (2015) designed "Fast Rule-Based Heart Disease Prediction using Associative Classification Mining". In the proposed Stream Associative Classification Heart Disease Prediction (SACHDP), we used associative classification mining over landmark window of data streams. This paper contains two phases: one is generating rules from associative classification mining and next one is pruning the rules using chi-square testing and arranging the rules in an order to form a classifier. Using these phase to predict the heart disease easily [5]. M.Satish, et al. (2015) used different Data Mining techniques like Rule based, Decision Tree, Navie Bayes, and Artifical Neural Network. An efficient approach called pruningclassification association rule (PCAR) was used to generate association rules from cardiovascular disease warehouse for prediction of Heart Disease. Heart attack data warehouse was used for pre-processing for mining. All the above discussed data mining technique were described [6]. Lokanath Sarangi, Mihir Narayan Mohanty, Srikanta Pattnaik (2015) "An Intelligent Decision Support System for Cardiac Disease Detection", designed a cost efficient model by using genetic algorithm optimizer technique. The weights were optimized and fed as an input to the given network. The accuracy achieved was 90% by using the hybrid technique of GA and neural networks [7]. "Prediction and Diagnosis of Heart Disease by Data Mining Techniques" designed by Boshra Bahrami, Mirsaeid Hosseini Shirvani. This paper uses various classification methodology for diagnosing cardiovascular disease. Classifiers like KNN, SVO classifier and Decision Tree are used to divide the datasets. Once the classification and performance evaluation the Decision tree is examined as the best one for cardiovascular disease prediction from the dataset[8]. Mamatha Alex P and Shaicy P Shaji (2019) designed "Prediction and Diagnosis of Heart Disease Patients using Data Mining Technique". This paper uses techniques of Artificial Neural Network, KNN, Random Forest and Support Vector Machine. Comparing with the above mentioned classification techniques in data mining to predict the higher accuracy for diagnosing the heart disease is Artificial Neural Network[9].

3. CONCLUSION

In this paper, a literature survey of review delivers the concept of various techniques has been studied for diagnosing the cardiovascular disease. Use of big data, machine learning along with data mining can provide promising results to bring the most effective accuracy in analysing the prediction model. The main aim of this paper diagnosing the cardiovascular disease or the heart disease and using different methods and many approaches to get prediction. REFERENCES

[1] Bo Jin ,Chao Che, Zhen Liu, Shulong Zhang, Xiaomeng Yin, And Xiaopeng Wei, "Predicting the Risk of Heart Failure With EHR Sequential Data Modeling" ,IEEE Access 2018. [2] Aakash Chauhan , Aditya Jain , Purushottam Sharma , Vikas Deep, "Heart Disease Prediction using Evolutionary Rule Learning", "International Conference on "Computational Intelligence and Communication Technology" (CICT 2018). [3] Ashir Javeed, Shijie Zhou, Liao Yongjian, Iqbal Qasim, Adeeb Noor, Redhwan Nour4, Samad Wali And Abdul Basit , "An Intelligent Learning System based on Random Search Algorithm and Optimized Random Forest Model for Improved Heart Disease Detection" , IEEE Access 2017. [4] Senthilkumar Mohan, Chandrasegar Thirumalai, and Gautam Srivastava, "Effective Heart Disease Prediction Using Hybrid Machine Learning Techniques", IEEE Access 2019. [5] K.Prasanna Lakshmi, Dr. C.R.K.Reddy, "Fast Rule-Based Heart Disease Prediction using Associative Classification Mining", IEEE International Conference on Computer, Communication and Control (IC4-2015). [6] M.Satish, D Sridhar, "Prediction of Heart Disease in Data Mining Technique", International Journal of Computer Trends & Technology (IJCTT), 2015. [7] Lokanath Sarangi, Mihir Narayan Mohanty, Srikanta Pattnaik, "An Intelligent Decision Support System for Cardiac Disease Detection", IJCTA, International Press 2015. [8] Boshra Bahrami, Mirsaeid Hosseini Shirvani, "Prediction and Diagnosis of Heart Disease by Data Mining Techniques", Journal of Multidisciplinary Engineering Science and Technology (JMEST) ISSN: 3159-0040 Vol. 2 Issue 2, February–2015. [9] Mamatha Alex P and Shaicy P Shaji,"Prediction and Diagnosis of Heart Disease Patients using Data Mining Technique", International Conference on Communication and Signal Processing 2019. [10] Shantakumar B.Patil and Y.S.Kumaraswamy, "Intelligent and Effective Heart Attack Prediction System Using Data Mining and Artificial Neural Network", European Journal of Scientific Research, Vol.31, No.4, pp.642-656, 2009 [11] Peter, T.J, Somasundaram, K "An empirical study on prediction of heart disease using classification data mining techniques" International Conference on Advances in Engineering, Science and Management (ICAESM) 2012. [12] Mai Shouman, Tim Turner, Rob Stocker, " Using data mining techniques in heart disease diagnosis and treatment", IEEE Japan-Egypt Conference on Electronics, Communications and Computers, 2012. [13] Syed Umar Amin, Kavita Agarwal, Dr. Rizwan Beg "Genetic Neural Network based Data mining in

prediction of Heart disease using risk factors" IEEE Conference on Information and Communication Technologies (ICT 2013). [14] Shamsher Bahadur Patel, Pramod Kumar Yadav and Dr. D.P.Shukla, "Predict the Diagnosis of Heart Disease Patients using classification Mining Techniques", IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS), 2013. [15] Dubey A, Patel R, Choure K, "An efficient data mining and ant colony optimization technique (DMACO) for heart disease prediction", International Journal of Advanced Technology and Engineering Exploration.; 1(1):1-6, 2014. [16] "Genetic Neural Network based Data mining in prediction of Heart disease using risk factors", Syed Umar Amin1, Kavita Agarwal2, Dr. Rizwan Beg Proceedings of 2013 IEEE Conference on Information and Communication Technologies (ICT 2013). [17] G. Purusothama and P. Krishnakumari, "A Survey of Data mining techniques on risk prediction: Heart disease", Indian Journal of Science and Technology, 2015.