Disease Prediction Based on Patient Treatment History

[1]Mr. Satish Manje, [2]Miss.RoshaniAdhikari, [3]Miss.Shweta Jadhav, [4]Mr.Ketan Mewati

[1]Asst.Professor,[2,3,4]UG Student,[1,2,3,4]Computer Engg. Dept. Shivajirao S. Jondhle College of Engineering & Technology, Asangaon, Maharshatra, India. [1]satishmanje93@gmail.com, [2]roshaniadhikari11@gmail.com, [3]24shwetajadhav@gmail.com, [4]ketanmewati02011999@gmail.com

Abstract- In day to day life medical and healthcare industries has big business. Healthcare industry produces large amount of data in daily routines.Prediction is does on the patient previous history and health related information, prediction is made. Data mining techniques and machine learning technique are used for the disease prediction, and also for the progression and re-occurrence of those diseases. New model is proposed in this paper for disease prediction. Deep learning concept and artificial neural network (ANN) is used for predicting the diseases. Probabilistic modelling and deep learning concept is used for Prediction. For that the three diseases heart, kidney, and diabetic's data set are taken. Dataset are built for those un-wellness.

Keywords-Health-care, Deep Learning, Artificial Neural Network, Disease Prediction, Health Data.

I. INTRODUCTION

"Prevention is better than cure", is universal truth. In the human life Health is the most important factor. So currently on a daily basis there's ought to do the prediction of diseases. Several researchers have used data processing and machine learning techniques for predicting the diseases supported the medical information or pathological information. These approaches are used for doing the prediction of diseases and re-occurrence of those diseases. Also, some other approaches used to predict the diseases and control the diseases. This approach also controls the progression of diseases. In the proposed system artificial neural network (ANN) and stochastic gradient algorithm are used for learning and doing the effective prediction of diseases. The system handles the both structured data and unstructured data with the help of pre-processing. For that collection of the patient previous history like patient diseases details are collected.By using that collected data a new data set is prepared. The system does the prediction of three diseases like heart, kidney, and diabetics. Data related to diseases is collected. Then this data is combined into single data set. In that firstly the common attributes are taken from that data sets and needed to take care from those problems.

II. AIMS AND OBJECTIVE

a) Aim

The aim of this project is to study disease prediction in humans based on historical data. Using ANN (Artificial Neural Network) algorithm prediction of disease is been made. With the help of the historical data of a patient system can predict what type of disease the patient can be suffering from. Using different attributes of patient(age, gender, blood pressure, blood sugar, Cholesterol, restecorg, thalach, exang, sg, al, rbc, sc, BMI for the heart, kidney and diabetes) diseases can be predicted easily. So that disease can be predicted early and treatment can be done as soon as possible.

b) Objective:

The system concentrates on the few diseases. So that the, early prediction can be made for avoiding and take caring of that disease. System contains three types of diseases like heart, kidney, and diabetes diseases. Considering for that three disease attributes like age, gender, blood pressure, blood sugar, Cholesterol, restecorg, thalach, exang, sg, al, rbc, sc, BMI for the heart, kidney and diabetes.

III. LITERATURE SURVEY

Paper1: Min Chen, Kai Hwang, Yixue Hao, Fellow, Lu Wang, and Lin Wang," By using Machine learning Algorithm predicting the diseases with Big Data technology from the Health care Commu-nities," IEEE, 2016.

It developed techniques for predicting the diseases with the assistance of machine learning. They will propose new techniques supported the machine learning thought with the assistance of convolution neural network. With the assistance of structured and unstructured information they will predict the diseases. They use machine learning and deep learning algorithms for prediction. In that machine learning algorithm such as k-nearest neighbour, naive Bayesian and decision algorithms and deep learning algorithm convolutional neural network used to predicting

the diseases risk. The predicting accuracy of projected rule is 94.8% with the high speed of predicting the diseases

Paper2: Darcy A., Davis, Nicholas Blumm, Nitesh V.Chawla, "Pre-dicting Individual Disease Risk Based on Medical History", ACM, 2008.

Proposed the strategy for predicting the diseases that relies on patient case history.They propose a CARE, cooperative Assessment and Recommendation Engine that depends on the case history of patient. They use the IDC-9-CM codes to predict the diseases risks. This technique is employed for predicting the chronic diseases. However CARE system generates prediction on solely feature visits of patients supported case history.

Paper3:R.Tamilarasi, Dr.R.Porkodi Department of Computer Science Bharathiar University, Coimbatore, Tamil Nadu, India "A Study and Analysis of Disease Prediction Techniques in Data Mining for Healthcare", IJERMT ISSN: 2278-9359 (Volume-4, Issue-3) (IJERMT) , March 2015.

In this project a system for predicting heart diseases with the assistance of information mining techniques. In life science great deal knowledge is generated from patient clinical reports different patient symptoms. In this they use numerous attributes and call coiffure methodology for predicting diseases. For predicting the diseases they uses data processing algorithmic rules like call tree algorithm, naive mathematician algorithmic rule, ANN rule, KNN rule with the classification of diseases. This data processing technique helps to aid skilled for designation of heart condition with higher accuracy.

IV. EXISTING SYSTEM

The standing organizations arrange a machine learning algorithm which can predict previously existing systems do the prediction on diseases but cannot predict the subtypes of diseases. Those systems also can't find the diseases which are caused by occurrences of any previously diseases. Those systems fail to predict possible conditions of people. In this system can handle only structured data but not an unstructured data. In current past, countless disease estimate classifications have been advanced exact diseases. In this existing system do the predictions on diseases, however cannot predict the subtypes of diseases. Those systems additionally can't notice the diseases that square measure caused by occurrences of any antecedently diseases. Those systems fail to predict potential conditions of individuals. Previous system will handle solely structured knowledge however not associate unstructured knowledge

V. COMPARTIVE STUDY

SR NO.	PAPER TITLE	AUTHOR NAME	METHOD	ADVANTAGE	DISADVANTAGE
1.	Heart Disease Prediction using Data Mining Techniques	Abhishek Rairikar, Vikas Sabale, Vedant Kulkarni	K-nearest neighbor, decision tree and naive bayes	video technology allows students to react emotionally to patient situations	KNN algorithm is lazy algorithm,
2.	By using ML Algorithm predicting the diseases with Big Data technology from the Healthcare Commu-nities	Min Chen, Kai Hwang, Yixue Hao, Fellow, Lu Wang, and Lin Wang	k-nearest neighbor, naive Bayesian and decision algorithms	Both structure and unstructured type of data disease can be predicted	It is difficult to determine window size of data
3.	Pre-dicting Individual Disease Risk Based on Medical History	Darcy A., Davis, Nicholas Blumm, Nitesh V.Chawla,	IDC-9-CM codes	Using IDC-9-CM similar or related disease of patient can be grouped.	Sometimes prediction is not made positively.
4.	A Study and Analysis of Disease Prediction Techniques in Data Mining for Healthcare	R.Tamilarasi, Dr.R.Porkodi Department of Computer Science Bharathiar.	Decision tree algorithm, naive bayes algorithm, neural network algorithm.	Accuracy of patient is high 85%	data mining techniques are lazy

VI. PROBLEM STATEMENT

Healthcare trade has become business. The care trade produces massive amounts of health-care information daily which will be wont to extract data for predicting illness which will occur to a patient in future whereas mistreatment the treatment history and health information.

VII. PROPOSED SYSTEM

In the proposed system artificial neural network (ANN) and stochastic gradient algorithm are used for learning and doing the effective prediction of diseases. The system handles the both structured data and unstructured data with the help of pre-processing. For that the patient previous history like patient diseases details are collected.

Collect the patient previous history like patient diseases details, and medical reports as knowledge sets the pre-processing was done victimization call tree regression for locating the missing values. The pre-processed knowledge set is employed for giving input to the projected model. The projected model relies on the factitious neural network (ANN). Once coaching and testing, system manufacture confusion matrix for generating accuracy of model. Finally deployed that the model for diseases prediction in real world situation.

VIII. ALGORITHM

Stochastic Gradient Decent

Gradient descent is an iterative algorithm that starts from a random point on a function and travels down its slope in steps until it reaches the lowest point of that function.

The steps of the algorithm are

Step1: Find the slope of the objective function with respect to each parameter/feature. In other words, compute the gradient of the function.

Step2: Pick a random initial value for the parameters. (To clarify, in the parabola example, differentiate "y" with respect to "x". If it had more features like x1, x2 etc., we take the partial derivative of "y" with respect to each of the features.)

Step3: Update the gradient function by plugging in the parameter values.

Step4: Calculate the step sizes for each feature as : step size = gradient * learning rate.

Step5: Calculate the new parameters as : new params = old params -step size

Step6: Repeat steps 3 to 5 until gradient is almost 0.

IX. MATHEMATICAL MODEL

- Equation of artificial neural network is,

$$y = f (w1x1 + w2x2 + w3x3 + w4x4 + ... + wnxn + b)$$

Here,

y is the output.

w is the weight.

x is the input.

b is the bias.

- The Cost function for stochastic gradient descent algorithm as,

$$Cost (C,(y^i,y)) = \frac{1}{2}(y^i - y)^2$$

Here, y^i is the output value, is the actual value, C is the cost.

- The overall cost function of the stochastic gradient descent algorithm as,

$$Train (C) = \frac{1}{m}\sum_{i}^{m}(C ((y^i - y))$$

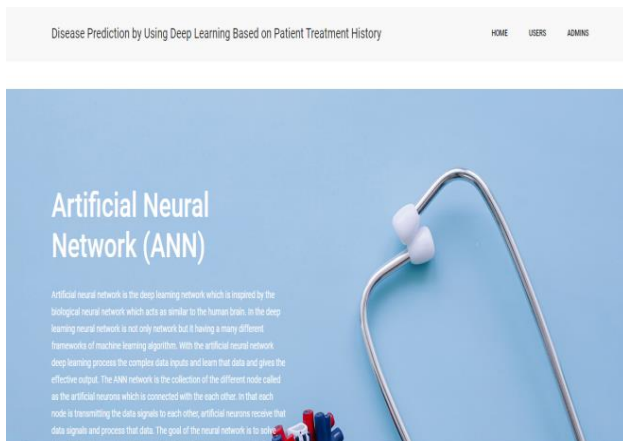## XII. DESIGN DETAILS

Fig.2: System Home Page

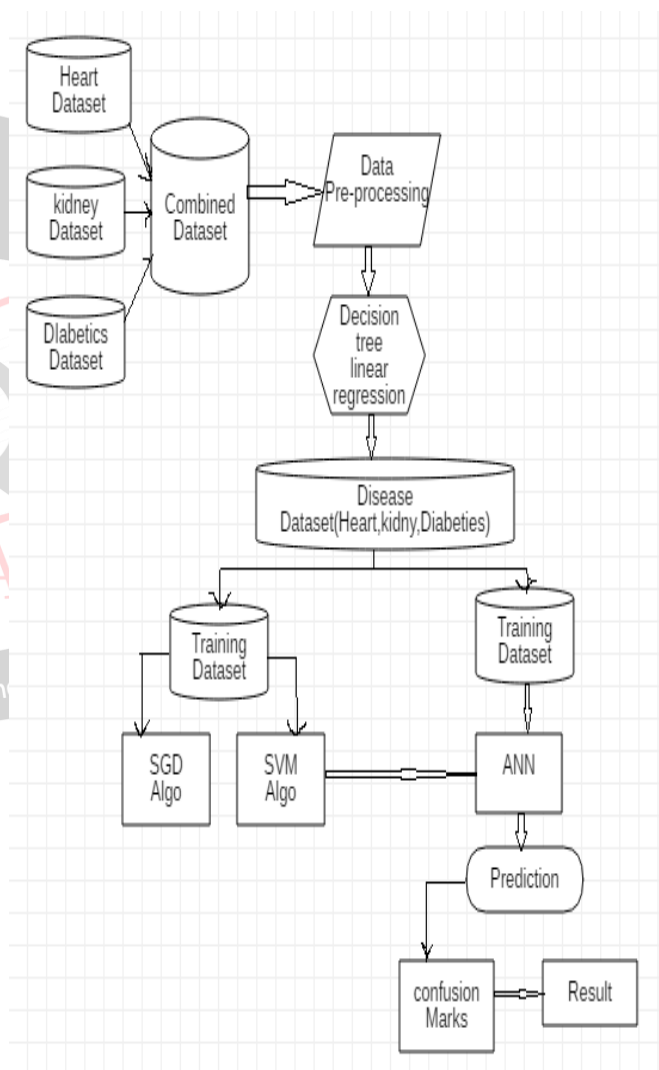Fig.3: Check Symptom

X. SYSTEM ARCHITECTURE

Fig.1: System Architecture

XI. ADVANATAGES

- System handles the both structured data and unstructured data with the help of pre-processing.
- This system does effective prediction of diseases.
- Systems also can find the diseases which are caused by occurrences of any previously diseases.

XIII. CONCLUSION

Thus, we have tried to implement the paper "KadamVinay R, K.L.S.Soujanya, Preety Singh", *"Disease Prediction by Using Deep Learning Based on Patient Treatment History"*, IJRTE March 2019 and in line with the implementation the conclusion is for the illness prediction. System has performed prediction of the illness whether or not the users have disease or not. System additionally calculated the accuracy of the prediction. The tactic of illness prediction, preprocessing, advantages the advantage of doing prediction of illness base on patient treatment history. Thus the higher than project enforced is essentially for the prediction of disease.

REFERENCE

[1] KadamVinay R, K.L.S.Soujanya, Preety Singh", "Disease Prediction by Using Deep LearningBased on Patient Treatment History", 2019

[2] SaurabhPandey, Manish MadhavaTripathi "Diagnosis of Diabetes using Artificial Intelligence Techniques by using Bio Medical Signal Data", International Journals of Research and Development in Applied Science and Engineering ISSN: 2454-6844 (IJRDASE), 2017.

[3] ParitoshKhubchandani,   SurajLala,   KundanJha, PallaviSaindane, RohitBijani, "Medical diseases Prediction using Arti-ficial Intelligence techniques", International Journal of Engineering Science and Computing (IJESC) March, 2017

[4] AnandanadarajahNishanth,   TharmarajahThiruvaran,"Iden- tify the important attributes of chronic kidney diseases for early detection", IEEE, 2017.

[5] Dr.B.Srinivasan, K.Pavya,"A Study for Prediction in Healthcare Sector using Data Mining Techniques", International Research Journal of Engineering and Technology Volume: 03 Issue: 03 (IRJET) March, 2016.

[6] Min Chen, Kai Hwang, Yixue Hao, Fellow, Lu Wang, and Lin Wang," By using Machine learning Algorithm predicting the diseases with Big Data technology from the Healthcare Commu-nities," IEEE, 2016.

[7] R.Tamilarasi, Dr.R.Porkodi Department of Computer Science Bharathiar University, Coimbatore, Tamil Nadu, India "A Study and Analysis of Disease Prediction Techniques in Data Mining for Healthcare", International Journal of Emerging Research in Management and Technology ISSN: 2278-9359 (Volume-4, Issue-3) (IJERMT) , March 2015.

[8] LoredanaStanciu, Adriana Albu, "Artificial Intelligence Benefits in Medical Predictions", November, 2015.