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Care expert assistant for Medicare system using Machine learning

SNEHAL BHOIR [1], PRITI DESHMUKH [2], PRAJAKTA JADHAV [3], MOHINI WAGH [4]

[1]*Snehal Bhoir, Dept. of Computer Engineering, Shatabdi Institute of Engineering & Research, Maharashtra, India.*
[2]*Priti Deshmukh, Dept. of Computer Engineering, Shatabdi Institute of Engineering & Research, Maharashtra, India.*
[3]*Prajakta Jadhav, Dept. of Computer Engineering, Shatabdi Institute of Engineering & Research, Maharashtra, India.*
[4]*Mohini Wagh, Dept. of Computer Engineering, Shatabdi Institute of Engineering & Research, Maharashtra, India.*

Abstract - This project Care assistant for health care system includes registration of patients, storing their details into the system, and additionally processed request within the pharmacy, and labs. The software package has the ability to abandon a novel id for each patient and stores the clinical details of each patient and hospital tests done mechanically. It provides a groundwork facility for understanding of every patient. Users will search details of a patient mistreatment the id. The prediction assistant which is knowledgeable for health care system may be entered employing a username and countersign. it's accessible either by associate administrator or secretarial assistant. entirely they will add awareness into the information may be recovered simply. The proposed system is especially not difficult. the information are well secured for personal use and makes the details of process in no time.

Key Words: ***Predict, SVM, Naïve bayes, CBR, NGO etc.***

1. INTRODUCTION

Now a day's Critical Patient Caring or monitoring System is a process where a doctor can continuously monitor more than one patient, for more than one parameter at a time in a distant place and also can have command over medicine dosage Development and evaluation of the ICU decision-support systems would be greatly facilitated by these systems. Virtual Expert prediction is a web Application which provide complete health care system providing the end user with a responsive User Interface, wherein the user can enter all the vital signs related to the patient using many predefined options. Moreover, this application is designed for the particular need of the user to carry out health examinations in a smooth and effective manner. This application can be used to reduce human error as much as possible in the field of medical science. it's not necessary that user is needed formal knowledge to use this system. Thus, by this all advantages proposed system proves it is user-friendly. Virtual Expert prediction web application is, as described above, it can predict primary stage of disease that can lead to safe, and secure, reliable and precise systems it will help particular person from death.

1.1 AIM

The aim is to provide as it is not intended for a particular organization. This project is going to develop a generic web application, which can be applied by any health organization or government in future. Moreover, it provides facilities to its citizens. Also, the web application is going to provide a huge amount of summary data.

1.2 OBJECTIVE

The main objective of this project is basically targeted to provide health related services to remote places and provide better health care and improve national health. Citizens can be instantly examined using this system which will be available to doctors, sevika, NGO, screeners, also it will provide proper diagnosis, maintain medical records and will be easily available to all.

2. LITERATURE SURVEY

A. Kidney Diseases

Serek et al. [12] planned a comparative study of classifiers performance for Chronic Kidney disease (CKD) detection using The Kidney Function Test (KFT) dataset. In this study, the classifiers used are KNN, NB, and RF classifier; their performance is examined in terms of F-measure, precision, and accuracy. As per analysis, RF scored better in phrases of F-measure and accuracy, while NB yielded better precision. In consideration of this study, Vijayarani [13] aimed to detect kidney diseases using SVM and NB. The classifiers were used to identify four types of kidney diseases namely Acute Nephritic Syndrome, Acute Renal Failure, Chronic Glomerulonephritis, and CKD.

B. Heart Diseases

Marimuthu et al. [16] aimed to predict heart diseases using supervised ML techniques. The authors structured the attributes of data as gender, age, chest pain, gender, target and slope [16]. The applied ML algorithms that were deployed are DT, KNN, LR and

NB. As per analysis, the LR algorithm gave a high accuracy of 86.89%, which deemed to be the most effective compared to the other mentioned algorithms. In 2018, Dwivedi [17] attempted to add more precision to the prediction of heart diseases by accounting for additional parameters such as Resting blood pressure, Serum Cholesterol in mg/dl, and Maximum Heart Rate achieved. The used dataset was imported from the UCI ML laboratory; it was comprised with 120 samples that were heart disease positive, and 150 samples that were heart disease negative. Dwivedi attempted to evaluate the performance of Artificial Neural Networks (ANN), SVM, KNN, NB, LR and Classification Tree.

C. Breast Diseases

Shubair [20] attempted for the detection of breast cancer using ML algorithms, namely RF, Bayesian Networks and SVM. The researchers obtained the Wisconsin original breast cancer dataset from the UCI Repository and utilized it for comparing the learning models in terms of key parameters such as accuracy, recall, precision, and area of ROC graph. The classifiers were tested using K-fold validation method, where the chosen value of K is equal to 10 [20].

D. Parkinson's Disease

Chen et al. [22] presented an effective diagnosis system using Fuzzy k-Nearest Neighbor (FKNN) for the diagnosis of Parkinson's disease (PD) . The study focused on comparing the proposed SVM-based and the FKNN-based approaches. the Principal Component Analysis (PCA) was utilized to assemble the most discriminated features for the construction of an optimal FKNN model. The dataset was taken from the UCI depository, and it recorded numerous biomedical voice measurement ranging from 31 people, 24 with PD. The experimental findings have indicated that the FKNN approach advantageously achieves over the SVM methodology in terms of sensitivity, accuracy, and specificity.

E. A. Common Diseases

Dahiwade et al. [9] proposed a ML based system that predicts common diseases. The symptoms dataset was imported from the UCI ML depository, where it contained symptoms of many common diseases. The system used CNN and KNN as classification techniques to achieve multiple diseases prediction. Moreover, the proposed solution was supplemented with more information that concerned the living habits of the tested patient, which proved to be helpful in understanding the level of risk attached to the predicted disease. Dahiwade et al. [9] compared the results between KNN and CNN algorithm in terms of processing time and accuracy. The accuracy and processing time of CNN were 84.5% and 11.1 seconds, respectively. The statistics proved that KNN algorithm is under performing compared to CNN algorithm. In light of this study, the findings of Chen et al. [10] also agreed that CNN outperformed typical supervised algorithms such as KNN, NB, and DT. The authors concluded that the proposed model scored higher in terms of accuracy, which is explained by the capability of the model to detect complex nonlinear relationships in the feature space. Moreover, CNN detects features with high importance that renders better description of the disease, which enables it to accurately predict diseases with high complexity [9], [10]. This conclusion is well supported and backed with empirical observations and statistical arguments. Nonetheless, the presented models lacked details, for instance, Neural Networks parameters such as network size, architecture type, learning rate and back propagation algorithm, etc. In addition, the analysis of the performances is only evaluated in terms of accuracy, which debunks the validity of the presented findings [9]. Moreover, the authors did not take into consideration the bias problem that is faced by the tested algorithms [9], [10]. In illustration, the incorporation of more feature variables could immensely ameliorate the performance metrics of under performed algorithms [11].

Sr. no	Author	Method	Description	Accuracy
1.	Purushottam, Kanak Saxena and Richa Sharma,	Efficient Heart Disease Prediction System	Classification rules generated by Decision tree algorithm	86.7%
2.	Senthilkumar, Mohan	Effective Heart Disease Prediction Using Hybrid Machine Learning Techniques	Combining the characteristics of Random Forest (RF) and Linear Method (LM)	88.7%
3.	Singh, Yeshvendra K	Heart Disease Prediction System Using Random Forest	Random Forest (RF) with cross validation	85.81%
4.	Tang, X., Liu, Z., Li, T., Wu, W. and Wei, Z	Expert Systems with Applications	The proposed model is thus useful as a decision support system for 32 heart disease	86%
5.	Patel, Jaymin, Dr TejalUpadhyay, and Samir Patel	Heart Disease Prediction Using Machine learning and Data Mining Technique	Data Mining; Decision Support System Classification	55.77%

Chart -1: Literature Survey

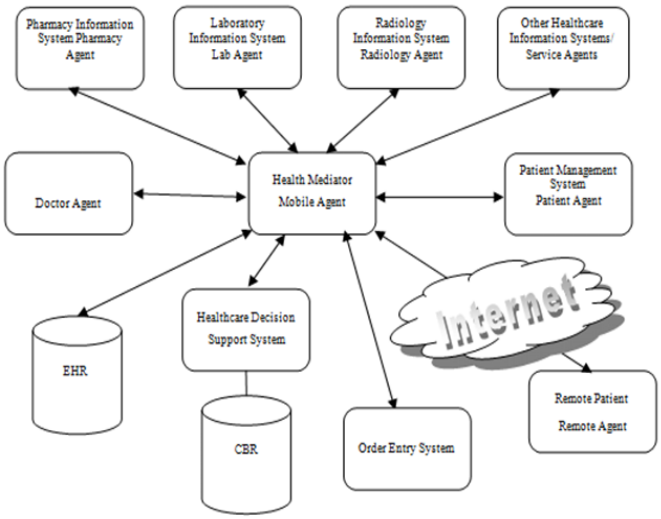

Fig -1: System Architecture

Our proposed system allows health professionals to reach any corner of the nation by having a remote clinic at their fingertips. Instant examination can be carried out from anywhere where a person registered first, his vital sign will be measured, symptoms will be gathered and a report will be generated based on the above inputs. Thus every registered member will be linked by a unique number that will be the AADHAR UID which in majority will reflect the national health scenario. Past medical records as well as the treatment procedure can be stored which will be further useful to provide better treatment based on past records. Computer generated prescription will further eliminate false prescription and irregularities in the pharmaceuticals.

3. METHODOLOGY

Methodology is a process that mainly consists of intellectual activities usually only the end goal of the methodology process is manifested as the product or result of the physical work. In software, the term methodology is used to refer to series of steps or a procedure which governs the activities of analysis and guidelines to design or an organized documented set of procedures and guidelines for one or more phases of the (software life cycle), such as analysis or design. Any project is basically divided into many groups for easy understanding and coding.

- User Registration:

Logging in, (or logging on or signing in or signing on), is the process by which an individual gains access to a computer system by identifying and authenticating themselves. The user credentials are typically some form of "username" and a matching "password", and these credentials themselves are sometimes referred to as a login.

– Questionnaire

Here the user feed the values in the application form, he/she fills up each and every details in the form. All these details gets saved in the server and details and from that we can extract the features of the disease. The entered details are matched with the datasets which are saved in the database.

– Check for the disease symptoms:

After matching the details with the datasets it checks for the disease symptoms. One feature may match with different disease. So, it's necessary to check each and every matched details in order to predict the correct disease.

– Generate Report:

A report will generate on the basis of symptoms which are matched. It predicts the disease and send it to user mobile application, and finally add some tips/suggestions to the user like nearby hospital details and it notifies patient by sending a message alert to patient mobile number.

3.1 ALGORITHMS

3.1.1 Naïve Bayes Algorithm:

Naive bayes algorithm is mainly used in text classification that includes a high-dimensional training dataset one of the simple and most effective Classification algorithms which helps in building the fast machine learning models that can make quick predictions.

3.1.2 Support Vector Machine (SVM):

The main aim of SVM algorithm is to create the best line or decision boundary that can segregate n-dimensional space into classes so that we can easily put the new data point in the correct category in the future. The best decision boundary in SVM is called a hyper plane. This algorithm chooses the extreme points or vectors that will help in creating the hyper plane.

4. CONCLUSIONS

The conclusion is that our system will assist medical actors in their processes to enhance diagnostics Capabilities, treatment procedures, prescriptions and recommendations; and a creation of cooperative techniques for agents in a distributed medical environment. Another major contribution of this approach is the cost effectiveness of its implementation in terms of using and adapting the existing healthcare services together with information sources. In order to benefit from utilizing the proposed system, medical actors require modification of their business processes and changing

their behavior in using new technologies. This approach will improve the productivity of the medical professionals and the quality of healthcare in General.

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AUTHORS DETAILS

SNEHAL J. BHOIR,
Dept. of Computer Engineering,
Shatabdi Institute of Engineering and Research, Maharashtra, India.

PRITI S. DESHMUKH
Dept. of Computer Engineering,
Shatabdi Institute of Engineering and Research, Maharashtra, India.

PRAJAKTA D. JADHAV
Dept. of Computer Engineering,
Shatabdi Institute of Engineering and Research, Maharashtra, India.

MOHINI P. WAGH
Dept. of Computer Engineering,
Shatabdi Institute of Engineering and Research, Maharashtra, India.