

CLOUD BASED ENHANCED CARDIAC DISEASE PREDICTION USING NAÏVE BAYESIAN ALGORITHM

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Abstract - Cloud assisted mobile-health observance applies the widespread mobile and cloud computing technologies to produce feedback call support, has been thought of as Associate in Nursing activist approach to up the standard of care service and prediction system whereas lowering the care price. Unfortunately, it conjointly poses a significant risk on each patient's privacy and belongings of observance service suppliers, that may discourage the wide adoption of mobile-Health technology The concept is to find the important issue in existing and design a privacy preserving mobile health monitoring system. The outsourcing cryptography technique and a fresh planned key personal proxy re secret writing area unit wont to shift the procedure quality of the concerned parties to the cloud while not compromising client's privacy and repair provider's holding. Finally, our security and performance analysis demonstrates the effectiveness of our projected style. Proving secure and performance analysis demonstrates the effectiveness in Cloud Computing technique.

Key Words: Bayesian algorithm, disease prediction, encryption, cloud storage.

1. INTRODUCTION

In Developed and developing countries more people are suffered from cardiovascular diseases. Mortality rate due to cardio vascular diseases are higher today. If these diseases are detected earlier mortality rate can be reduced.

Healthcare system is the preservation of mental and physical health by preserving or treating illness of a person through services offered by provision. In day-to-day life, heart disease is the major cause of death in the world. The World Health Organization(WHO) has estimated that 12 million death occurs worldwide every year only due to heart diseases (over 80% of deaths), WHO estimated in future, almost 23.6 million people will die due to cardiac diseases i.e., Cardiac Attack. In world wide 25 countries has conducted the euro heart survey on heart diseases which includes with moderate severe native heart diseases and infective endocarditic diseases. Over the people population 71.9% of patients have native heart diseases and 28.1% has previous intervention. Mean age of people with heart disease is from 64 to 14 years. Hence the computerized method of diagnosing heart diseases based on prior data and

information can evaluate the patients with accuracy and symptoms are detected previously. So they can have a chance to recover from heart disease.

1.1 CLOUD STORAGE AND SECURITY

In the case of storage and security of patient's data encryption algorithm and cloud has been implemented. Advanced Encryption Standard (AES), which is an encryption technique to secure the patient's data. AES uses the substitution technique and permutation. Combination of substitution and permutation makes the system faster in encrypting the data. Cloud has been implemented after the encryption process and predicted data has been stored in the cloud for the future use. Hence the patient and doctor can share and view the reports generated by the prediction system.

The idea is to address the problems in existing remote storage system and build the cloud assisted storage and mobile health monitoring. Prediction system predicts the disease and protect the privacy of data. Outsourcing decryption technique has been proposed with the private key proxy re-encryption technique for decrypt the data only if the user provided with the secret key. This system is to achieve the goal of cloud without compromising the client's privacy.

In this system clinician can view the patient's data in cloud and can suggest the precautions that has been taken by the patients. Security can be enhanced with the help of OTP(One Time Password) concept. An OTP can be generated when both patient and doctor login to the system. Hence, only the authorized user can access the health records.

2. LITERATURE SURVEY

Salma Banu N.K and Suma Swamy proposed prediction of heart disease at early stage using data mining and big data analytic. They used various advancements of data mining (DM) models for measure of heart disease. Data mining expect a noteworthy activity in building a keen model for clinical structures to perceive coronary ailment (HD) using educational assortments of the patients, which incorporates chance factor related with coronary sickness. Clinical experts can help the patients by anticipating the coronary illness

before happening. The enormous information accessible from clinical finding is broke down by utilizing information mining devices and helpful data known as information is separated. Mining is a strategy for investigating monstrous arrangements of information to take out examples which are covered up and beforehand obscure connections and information discovery to help the better comprehension of clinical information to forestall coronary illness. There are numerous DM procedures accessible specifically Classification systems including Naïve bayes(NB), Decision tree (DT), Neural system (NN), Genetic calculation (GA), Artificial insight (AI) and Clustering calculations like K-NN, and Support vector machine (SVM). A few examinations have been done for creating expectation model utilizing singular system and furthermore by consolidating at least two procedures. This paper gives a quick and straightforward review and understanding of available figure models using data mining from 2004 to 2016. The assessment shows the precision level of each model given by different investigators.

Sayali Ambekar and Rashmi Phalnikar has proposed Disease Risk Prediction by Using Convolutional Neural Network. Data analysis plays a significant role in handling a large amount of data in the healthcare. The previous medical researches based on handling and assimilate a huge amount of hospital data instead of prediction. Due to an enormous amount of data growth in the biomedical and healthcare field the accurate analysis of medical data becomes propitious for earlier detection of disease and patient care. However, the accuracy decreases when the medical data is partially missing. To overcome the problem of missing medical data, we perform data cleaning and imputation to transform the incomplete data to complete data. We are working on heart disease prediction on the basis of the dataset with help of Naïve bayes and KNN algorithm. To extend this work, we propose the disease risk prediction using structured data. We use convolutional neural network based unimodel disease risk prediction algorithm. The prediction accuracy of CNN-UDRP algorithm reaches more than 65%. Moreover, this system answers the question related to disease which people face in their life.

Azhar Hussein Alkeshuosh, Mariam Zomorodi Moghadam and Inas Al Mansoori proposed Using PSO Algorithm for Producing Best Rules in Diagnosis of Heart Disease. Heart disease remains a growing global health issue. In the health care system, limiting human experience and expertise in manual diagnosis results in inaccurate diagnosis, and therefore the information about various illnesses is either inadequate or lacking in accuracy as they're collected from various sorts of medical equipment. Since the correct prediction of a person's condition is of great importance, equipping medical science with intelligent tools for diagnosing and treating illness can reduce doctors' mistakes and financial losses. In this paper, the Particle Swarm Optimization (PSO) algorithm, which is one of the most

powerful evolutionary algorithms, is used to generate rules for heart disease. First the random rules are encoded and then they are optimized based on their accuracy using PSO algorithm. Finally we compare our results with the C4.5 algorithm.

Hamidreza Ashrafi Esfahani and Morteza Ghazanfar proposed Cardiovascular disease detection using a new ensemble classifier. One of the biggest problems in mechanical life is the lack of mobility that can cause thousands of problems in human health. In the last decade, alongside the lifetime of a machine, many diseases, including cancer and disorder, are common in many societies that kill many of us per annum. Data mining is based on collected data and existing history to create a model that can be effective in predicting new cases of a disease, whether they are risky or not. The higher the accuracy of the prediction or recognition of a given pattern or model means the higher efficiency of the algorithm. In this study, data on cardiovascular patients collected from the UCI Laboratory is utilized for applying discovery pattern algorithms including Decision tree, Neural Networks, Rough Set, SVM, Naive Bayes, and compare their accuracy and prediction. Finally, we propose a hybrid algorithm to increase the accuracy of these algorithms.

3. PROPOSED WORK

3.1 HEALTH DATA COLLECTION

The system stores the secured data or report in cloud. It collects the medical data of individual patient and store it in the database, then the data has been converted into attribute vectors which provided has an input to the prediction system. Evert Data set has been classified based on the prior data provided to the system.

With the help of various data provided by the patient, the clinician can identify the disease and communicate with the patient and at the same time the patient can collect their the prescription through the cloud assisted system.

3.2 EXPLORATORY DATA ANALYSIS

In this module, drawing in assessment are performed to choose the goal variable. Various classes of data has been explored and the other possibly risky elements (High Cardinality) are recognized. The framework has pictured the objective variable in a histogram which is a decent strategy for understanding the dispersion of the information to aid parameter tuning.

3.3 DATA SPECIALIZATION SEARCHING

In this module, the system will provide the information which depends on role of access. There will be same dataset for all the users in the system, but it will change to provide to

user based authority level. Clinician and patient has played major role in this prediction system. Data specialized searching has been done with the help of Naïve Bayesian classification or Naïve Bayesian Algorithm. Depending on the probability values the classifier classifies the user data and prediction system predicts the disease. Whenever the clinician wants to see the data over the system, first it will check the specialization and based on that it will provide the relevant information to the clinician. Simultaneously the patient needs to look through the information, it relies upon his/her position level. Right now the information will be in the scrambled structure.

ATTRIBUTES USED:

- Age
- Sex
- Chest pain type
- Blood pressure
- Cholesterol value
- Sugar level
- Rest-ECG value
- Thalach value
- Exang
- Oldpeak value
- Height
- Weight.

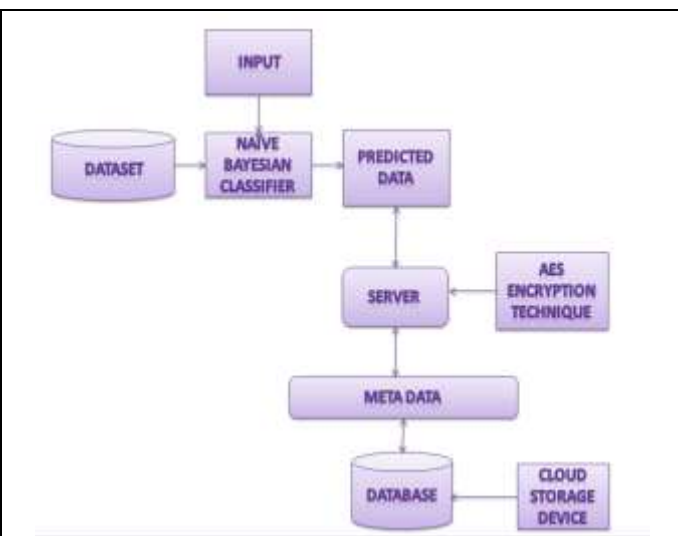


Fig.1 Architecture diagram.

3.4 TOKEN GENERATION:

In order to generate the private key for the attribute vector the client initially computes the identity representation set of each element in and delivers all the identity elements to the representative TA's (Trusted authority). The TA runs each identity of users i.e., patient or clinician and it delivers all the respective private key to them for decryption. At the time of accessing the system the private will be sent to the user. Further authorisation will be provided with the help of

the OTP, which has been sent to their mail at the time of access.

Request for decryption decrypted data

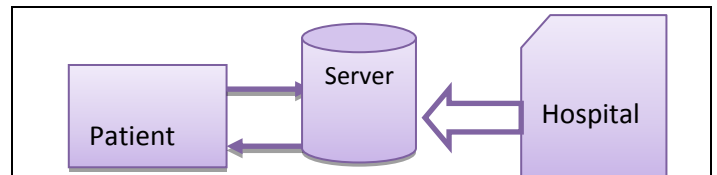


Fig.2Token Generation.

3.5 REPORT GENERATION:

At long last immediately anticipated info has been modified over into the PDF as a report, that has been gotten to by the consumer with the help of the personal key or mystery key that is given by the framework. Another form is that the pie chart has been displayed to the user, in that the possibility of heart disease has been known by the user.

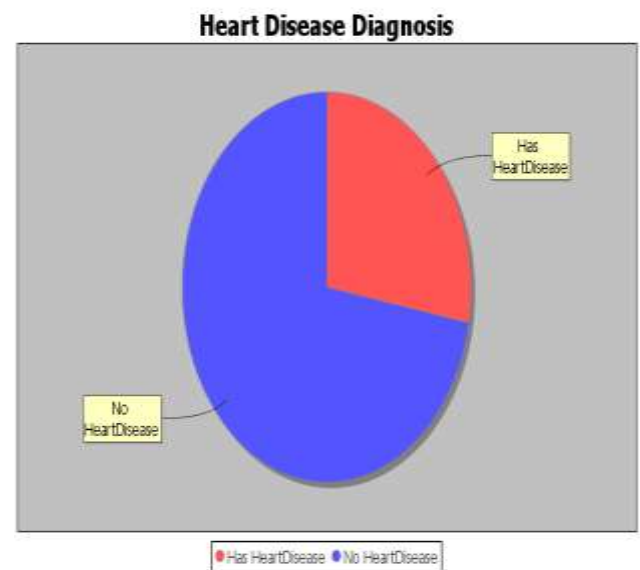


Fig.3 Pie chart.

4. CONCLUSION

At last the cloud helped security saving portable wellbeing checking framework, called CAM which ensure the protection of customer's information and the licensed innovation of versatile wellbeing specialist co-ops. The proposed model is compelling and effective when contrasted with other existing framework. This framework will help successfully to the cardiologist to distinguish the coronary illness and speak with the patient in secure way. At Emergency, hospital can have this framework to help the

cardiologist. By and by the patients can have their assurance remotely and the wellbeing measures can be taken heretofore.

5. FUTURE WORK

To build up the wearable observing framework and self-revealing by the patient himself/herself by expounding the target and emotional components of data worried about the patient.

Objective is to empower the controlled sharing of anticipated information over the web based life to their overseers and their relatives.

Further enhancement towards behavioral monitoring based on user-to-system interactions, development of methodologies for handling contextual data and improve the security with the help of firewalls and advanced encryption and decryption technique.

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