INTERNATIONAL RESEARCH JOURNAL IN ADVANCED ENGINEERING AND TECHNOLOGY (IRJAET) E - ISSN: 2454-4752 P - ISSN : 2454-4744
VOL 5 ISSUE 4 (2019) PAGES 4442 - 4444
RECEIVED : 12.06.2019 PUBLISHED : 16.07.2019

July 16.2019

PRIVACY PRESERVING PATIENT CENTRIC CLINICAL DECISION SUPPORT SYSTEM ON NAÏVE BAYESIAN CLASSIFICATION

[1]Shakila. G, M.Phil, Research Scholar, K.M.G College Of Arts & Science, Gudiyattam.

[2]Prof.K.Jayasankar, Assistant Professor, Pg & Research Department Of Computer Science & Applications, K.M.G College Of Arts & Science, Gudiyattam.

Abstract:

Clinical Decision Support System (CDSS), assist the physicians in diagnosing patient disease with similar symptoms, and suggest proper treatment for them in much more efficient manner. The advantage of clinical diagnosis support system is that it reduce the diagnosis time and give accurate prescription to all the diseases available in our database. This paper performs the study on different data mining techniques like Naive Bayesian classifier, SVM and many more that are available for the CDSS that helps to offered many advantages over the traditional healthcare systems and opens a new way for clinicians to predict patient's diseases. As healthcare is the field in which Security of patient's data is paramount important, this paper also provide the study of different security mechanisms that are suitable for the CDSS along with data mining techniques. The security mechanisms that is RSA and Holomorphic encryption technique seems more proper that meets the security Goals for CDSS.

KEYWORDS: Clinical Decision Support System (CDSS), Data Mining, Privacy Preserving, Naive Bayesian classifier, Support Vector Machine, Homomorphic Encryption.

1. INTRODUCTION

As the large amounts of clinical data generated every day, our data mining technique that mainly require for classification should be compatible enough that can be utilized to execute valuable information to improve clinical decision support system. The paper shows that as the clinical data mainly related to the patients are growing on increasing and reached towards storage on cloud. So now to extract important information from this huge amount of data securely, requires Homomorphic encryption techniques and SVM classification techniques that results in generation of proper Clinical Decision Support System. Over the past two decades, Health care industry abundantly broadcast in the global scope to provide health care and health care services to patients', has never faced such a such a growth in technological side. However, if no appropriate technique is developed to find great potential economic values from big healthcare data, these data might not only become meaningless but also requires a large amount of space to store and manage. Different Data mining that are available has more potential for the healthcare industry to enable health systems to automatically analyze and provide security to the historic data which is stored in cloud. Over the past few years, there massive improvement in data mining technique has a major impact on human's lifestyle by predicting behaviors and future trends. To reduce the diagnosis time and to improve the accuracy, a new diagnosis system should be developed to provide diagnosis in a faster way. Clinical decision support system has been defined as an "active knowledge systems", which use two or more items of patient's data to generate case specific advice. This implies that a CDSS is simply a decision support

INTERNATIONAL RESEARCH JOURNAL IN ADVANCED ENGINEERING AND TECHNOLOGY (IRJAET) E - ISSN: 2454-4752 P - ISSN : 2454-4744
VOL 5 ISSUE 4 (2019) PAGES 4442 - 4444
RECEIVED : 12.06.2019 PUBLISHED : 16.07.2019
July 16.2019

system that is focused on using knowledge management in such a way to achieve clinical advice for patient care based on multiple items of patient's data. The main purpose of modern CDSS is to assist clinicians at the point of care. This means that clinicians interact with a CDSS to help to analyses, and reach a diagnosis based on patient data.

2. RELATED WORK

The patient medical data is of large amount along with this one of the main challenges is how to keep patient's medical data away from unauthorized disclosure. Various approaches, such as cryptographic and non-cryptographic are used to preserve the privacy of health-data in the cloud. The majority of the solutions use certain cryptographic techniques to conceal the contents of health records, while quite a few solutions are based on non-cryptographic approaches using policy based authorizations. The benefit of cryptographic techniques is that they not only are capable of encrypting the data in storage and over the network [2], but also employ authentication mechanisms requiring decryption keys and verification through digital signatures. Moreover, fine-grained and patient-centric access control mechanisms have also been deployed that enable patients to specify the individuals who could have access to healthdata [3]. Furthermore, quite a few privacy preserving solutions allow the patients themselves to encrypt the health data and provide the decryption keys to the individuals with right-to-know privilege. This chapter encompasses the recent efforts that have been made to preserve the privacy of the health-data in the cloud environment. such as a knowledge base, an inference engine or an artificial intelligence component, are required to expose the knowledge by means of a service would be a convenient approach to implement alerts and reminders, knowledge service and diagnostic/treatment CDSS, and apply them properly. Findings in this paper said that several authors may be not properly using the terms cloud-based and cloud computing, since they are focusing on service-based or webbased architectures and also they are not detailing the conducted architectural design process. This will raises concerns and worries, since such lack of rigor on the software engineering process does not allow identifying considered sources and used methods for gathering quality scenarios. As there was not any application of architectural evaluation methods based on scenarios. Consequently, well known concerns such as security and privacy may not be being well validated in practice.

3. ANALYSIS

Data mining techniques have been widely used in clinical decision support systems (CDSS) that performs prediction and diagnosis of various diseases with better accuracy. The techniques have been very effective and helps in developing clinical support systems because they are able to detect hidden patterns and relationships in medical data. There are large no. of classification techniques which can be used for clinical decision support system. The aim of classification is to predict the target class for each case in the data accurately. Classification is important when a repository of data contains samples that can be used as the basis for future decision making. Support vector machine (SVM) has become more and more popular tool in task of machine learning involving classification, regression etc. Support Vector Machine (SVM) is primarily a classier method that performs classification tasks by constructing hyper planes in a multidimensional space that separates cases of different class labels of training examples, each marked as belonging to one or the other of two categories, an SVM training algorithm builds a model that assigns new examples to one category or the other, making it a non-probabilistic binary linear classifier. Support Vector Machine is a state of the art classification. It performs well with real world application such as classifying text, classifying images etc. SVM are the standard tools for machine learning and data mining. And with

this large amount of application and advantage, we will also use SVM for our proposed classification technique in CDSS.

CONCLUSION

For speeding up the diagnosis time and improve the diagnosis accuracy, a new system in healthcare industry should be workable to provide a much cheaper and faster way for diagnosis. Clinical Decision Support System (CDSS), with various data mining techniques being applied to assist physicians in diagnosing patient diseases with similar symptoms, has received a great attention recently. This paper provides the study of different types of work done previously by different authors. There are several techniques studied for data mining such as Naive Bayesian classifier, SVM, etc. Out of which by selecting one of the popular machine learning tools, that has been widely used to predict various diseases in CDSS. Despite its simplicity, it is more appropriate for medical diagnosis in healthcare than some sophisticated techniques. The advantages of clinical decision support system include not only improving diagnosis accuracy but also reducing diagnosis time. For the purpose of providing security to the sensitive information of patient data some security techniques are studied. With the use of RSA encryption and Homomorphic encryption technique, the patient's privacy over the large amount of data will achieved. The data that will be transfer is present in encrypted data, so that there will be no loss in the privacy of patients data while training the classifier and providing data on the network.

REFERENCES

[1] Ximeng Liu, Rongxing Lu, Jianfeng Ma, Le Chen, and Baodong Qin, "Privacy- Preserving Patient-Centric Clinical Decision Support System on Naïve Bayesian Classification", IEEE JOURNAL OF BIOMEDICAL AND HEALTH INFORMATICS, VOL. XX, NO. XX, DECEMBER 2014.

[2] Assad Abbas, Samee U. Khan, "e-Health Cloud: Privacy Concerns and Mitigation Strategies", North Dakota State University, USA.

[3] Jim Basilakis, Bahman Javadi, Anthony Maeder, "The Potential for Machine Learning Analysis over Encrypted Data in Cloud-based Clinical Decision Support – Background and Review", Proceedings of the 8th Australasian Workshop on Health Informatics and Knowledge Management (HIKM 2015), Sydney, Australia, 27 - 30 January 2015.

[4] V. Krishnaiah, G. Narsimha, N. Subhash Chandra, "Heart Disease Prediction System using Data Mining Techniques and Intelligent Fuzzy Approach: A Review", International Journal of Computer Applications (0975 – 8887), Volume 136 – No.2, February 2016.

[5] Luis Tabares, Jhonatan Hernandez, Ivan Cabezas member IEEE, "Architectural approaches for implementing Clinical Decision Support Systems in Cloud.