© 2016 IJSRSET | Volume 2 | Issue 4 | Print ISSN: 2395-1990 | Online ISSN : 2394-4099
Themed Section: Engineering and Technology

Review on Medical Expert System in Cloud Environment

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ABSTRACT

Diabetes is a leading health issue not only in industrial but advancing Countries as well and its incidence is inclining. It is a condition in which the body inadequate to generate or suitably use the hormone called insulin that ‘‘unlocks” the cells of the body and permits glucose to enter and fuel them. There are various factors which required to be investigated to diagnose the diabetic patient, and this makes the physician’s job difficult. So we will carry out a profitable technique for categorization of patients for diabetes with the use of soft computing method.

Keywords: Medical, Cloud, Machine Learning, Prediction.

I. INTRODUCTION

The rising cost of healthcare, the increase in elderly population, and the prevalence of chronic diseases around the world urgently demand the transformation of healthcare from a hospital-centered system to a person-centered environment, with a focus on citizens’ disease management as well as their wellbeing. The development of personal mobile devices such as smart phones and tablets is helping establish a model of mobile health (m-Health) that can facilitate a continuum of person-centered care by relying on these mobile devices as a medium of sensing, interaction, and communication.

Wearable devices encompass a variety of functions including data collection from on-body sensors, preprocessing the data, momentary data storage, and data transfer to internet-connected immediate neighbors such as mobile phones or to a remote server. It is the characteristic of wearability that adds value to these devices and allows customizing the collection of body’s physiological or motion data depending upon the end-user application. While wearable sensors offer significant advantages to healthcare by automating remote healthcare interventions that include diagnostic monitoring, treatments and interoperability between patients and physicians, they face barriers such as the requirement to work in close proximity to other computing devices to compensate for low computing power, short battery life, and short communication bandwidth.

Figure 1: Wearable device in Healthcare

In order to overcome this barriers and to respond to the patients’ health monitoring requirements few systems have been proposed that provides an integrated platform to enable access to data gathered using wearable sensors via a web application but still many challenges need to be addressed **.** The system provides clinicians with a means to interact remotely with patients in the home setting, to configure the sensor nodes for the application at hand, and to record annotated data.

Body Sensor Network (BSN): A Wireless body sensor network (BSN) is a collection of wearable (programmable) sensor nodes communicating with a local personal device. The sensor nodes have computation, storage, and wireless transmission capabilities, a limited energy source (i.e., battery),and different sensing capabilities depending on the physical transducer(s) they are equipped with. Common physiological sensing dimensions include

body motion, skin temperature, heart rate, skin conductivity, and brain activity.

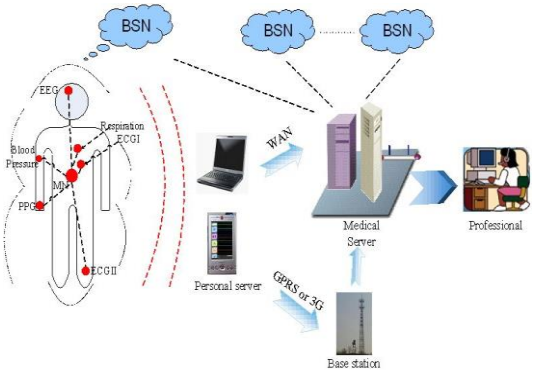


Figure 2: Diagram of Body Sensor Network

Diabetes is a leading health issue not only in industrial but advancing Countries as well and its incidence is inclining. It is a condition in which the body inadequate to generate or suitably use the hormone called insulin that ‘‘unlocks” the cells of the body and permits glucose to enter and fuel them. There are various factors which required to be investigated to diagnose the diabetic patient, and this makes the physician’s job difficult. So we will carry out an profitable technique for categorization of patients for diabetes with the use of soft computing method. Our considerable establishment is to enhance the accuracy of diabetes dataset. Several methods have been investigated in the past to specify diabetic patients and anticipate the accuracy.

Currently cure does not exist for the diabetes, and then only option is to take care of the health of people affected, maintain their glucose levels in the blood to the nearest possible normal values. Recently **Cloud Computing** becomes more prevalent because of its much cheaper and more powerful features, business magnates like Google, Amazon and Chinese IT enterprises Alibaba, Baidu have paid more attention on cloud computing[13]. Cloud Computing maximizes the effectiveness of the whole network's shared distributed hardware and software resources, and products a new industry method about use-on demand, pay-on-use, self-service to offer resources or services to multiple users and reallocate users' source demands dynamically.

II. METHODS AND MATERIAL

1. Wireless Sensor Related Work

Brito et al. [1]: To aggregate a number of heterogeneous, off-the-shelf, devices from which clinical measurements can be acquired. To provide access and integration with an 802.15.4 network of wearable sensors. Specialized layered approach in designing heterogeneous network. Service layer and middleware layers interact with each other using remote method function calls. Average response time in dispatch and processing used for evaluation. Service layer of this project can interact with mat lab 7.x (middleware) to demonstrating interaportabity. Average time used in dispatching ECG segment in xml based format and in simplified format using window PC is less while in Window mobile PDA is more.

Chen et al[2]: To design and implementation monitoring the system to minimize command latency, video latency, recovery latency and data uploading latency. Proposed arguments solutions for various types of involved in building and maintaining web-based system for health monitoring. Proposed a compression algorithm and validated using case study approach, which was conducted on particular platform of body sensors. Used three tier web based system to implemented the average data latency and video latency**.** SHIMMER sensors are used to build the system. Used the video compression for uploading the video etc. Use the mobile devices as a gateway to collect the data. Display the results of analysis of the gathered data in the home settings.

Mehta et al. [3]: To detecting the hyper functional (module) pattern of voice using mobile/smartphones platform sensors. Comparative analysis of temporal filtering method for detection of voice disorder with respect to spectral method. Proposed temporal algorithm for voice disorder item in mobile phone technology. Inverse filtering techniques yields comparable results with better accuracy from spectral methods as it is temporal in nature. Air flow measures maximum flow declination rate, speed quotient (sq),open quotient(oq) spectral slope measures shows that these measures validate the accuracy of proposed techniques.

Andreas et al.[4]: To scale up and integrate newer

technologies like social sharing of recording information ,platforms with the patient driven approach. To implement a prototype on mobile devices for feasibility and applicability of the presented work. Fine grain approach in security design. Attribute level security design using cipher text encryption algorithm. A study has been conducted on sixteen subjects with user acceptance evaluation good response to the concept in concept of patient sharing needs.

Duane et al. [5]: To illustrate the new Health Level-7(HL7) standard Fast Healthcare Interoperatibilty Resource(FHIR) standard to achieve healthcare system interoperability. To explore the comparisons among HL7 existing standard with FHIR. Integration of social Layer with application using Restful API. Social layer integration evaluation using cost-benefit analysis in terms of communication cycle and energy. Existing HL7 standards v2 & v3 are not interoperateble themselves. HL7-v2 lack of formal ontogy while HL7-v3 offers semantic interoperatibilty but syntactically is complex. RESTful architecture is a stateless protocol using HTTP methods for transferring XML or JSON objects and arrays.

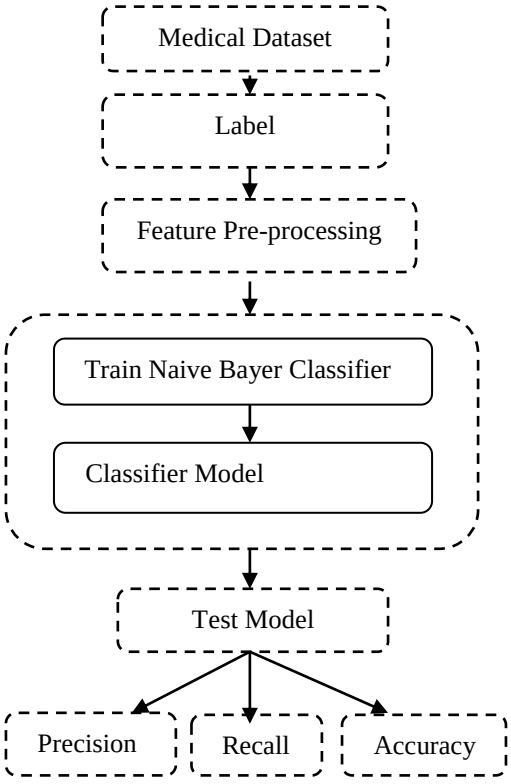
Ali et al.[6]: To overcome the interoperable issues in e-prescriptions system. To evaluate the feasibility of the pharmer by conducting a usability evaluation. Implementation of interoperable cross reference resources using service based function calls design. User acceptability test conduct based on Linked scale model. Availibity of multiple cross referential pharmaceutical data. Possible potential of cross linking such data sets. The result values of system usability scale(SUS) show that system build and illustrated high score about seventy five ,which means the system has passed the user acceptance.

Chen et al. [7]: To sharing human body sensor data continusoly 'beyond BAN communication' Improve the quality of service (QoS) performance of WBAN transmission significantly. Name data networking based entities and implementation of BSN objects with external network of mechanics Integration of zigbee protocol communication with TCP/IP using socket programming. Lifetime and energy consumption model used for evaluation of network system. Video, medical context, reports can be shared and delivered beyond BSN, especially in the case of medical emergency handling. Integration of WBAN with long term evolution and NDN, Named Data Networking protocol is the solution as it assures good coverage and quality in wireless technology. The simulation show, this concept is tangible with effective enhancement in results ,if zigbee protocol is used with integration with TCP/IP.

Wang et al [8]: To define the format for HL7 messages standard. To perform mapping and transfer of dynamic images using HL7 standard. User based evaluation – Participants answered to a set of six questions using the site under a three -minute time constraint for each question.

User interaction with the site has been recorded, and the participants were asked to elaborate on the decisions they made during a playback of the testing session. Several methods have been deployed to assess the data for three characteristics: user performance, user perceptions, and user strategies. Timestamp values along with the subsequent data recovery are permitted in HL7 message. Differentiation between the local time GMT, OTC ,NTP is now managed, where this was not available in sensors. Concept is implemented with the help of zigbee protocol.

2. Methodology



III. RESULTS AND DISCUSSION

In previous work, medical data computation is done by unsupervised learning like clustering that's why the error ratio increase at the training time as well as testing. In previous work, data is very huge but region of infrastructure cannot stored in one place so training time does not make good classifier.in previous work, medical data is not able to get reduced features by feature selection and feature extraction so to increase the complexity of process.the main aim is to improve the medical expert system by cloud and naive baye's classifier.to study and analysis of different expert system in the cloud. To propose and implement naive baye's classifier with cloud. To analyze the classifier model on the basis of precision, recall and accuracy. To explore the comparisons among hl7 existing standard with fhir. Integration of social layer with application using restful api. Social layer integration evaluation using cost-benefit analysis in terms of communication cycle and energy. Existing hl7 standards v2 & v3 are not interoperateble themselves. Hl7-v2 lack of formal ontogy while hl7-v3 offers semantic interoperatibilty but syntactically is complex. Restful architecture is a stateless protocol using http methods for transferring xml or json objects and arrays.

IV. CONCLUSION

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