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IOT based Health Monitoring Bot

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Abstract: Healthcare is important domain of application of IoT, immediate and cheap healthcare facilities are major concern of HealthCare Industry. Our aim is to develop an IoT and Machine Learning based application to monitor the health of patient effectively. Machine Learning is rapidly increasing field of Computer Science, with help of Machine Learning we can achieve accuracy in application. With different sensors we can monitor patient health as per our requirement, it surpasses a need to rush to a doctor for daily check-ups. In case of emergency application will send message(s) to doctor and concern keen of patient. In this application sensor data will be sent to cloud, then with help of Machine Learning data analysis is done to predict a health statistics or report of patient. This will help doctors to take precautions in early stage of any disease.
Keywords: IOT, Machine Learning, Analysis Prediction, Naïve Bayes, cloud

I. INTRODUCTION

The IoT (Internet of Things) is a next generation technology which is connection of uniquely identifiable smart objects and sensors based on the backbone of Internet. While it is connected in advance manner , the communication between devices goes beyond machine-to-machine. Using this automation the elderly health care system can be made more advanced[1]. Global health care services are facing challenges because of the rapid growth of elderly population, thus a creative way is needed to face this challenge due to recent development in electronics and many number of devices have come up which can monitor patients' health record in real time as well as can be monitored remotely through Internet[3]. IoT devices are RFID enabled this will help uniquely identify these devices. RFID will allow access of devices over Internet helpful in monitoring patient most of the time . As of 2021 it estimated that there will be 35 billion IoT devices connected over Internet, security and privacy is important aspect of any technology IoT devices are no exception, experts are continuously working to regulate and manage IoT devices. The project is aimed to validate the efficiency of integrating diverse technologies in recording daily activities of elderly people through devices like wearable sensors and actuators in real time[2]. With series of experiments and result, efficiency of system is improved. The system not only performs with high validity ,it is highly reliable for the elder people.

II. OBJECTIVES

1) *Alert Message:* When emergency occurs, alert message will be send to doctor or hospital, relative etc.
2) *Medication Remainder:* Irregular medication is major problem, our system will have remainder for medication, this will keep medication in check.
3) *Symptoms Checker:* This reference will enlist the type of symptoms of ailments that a patient has.

III. SCOPE

Mostly IoT based healthcare system is combination of heterogeneous computing system or app and wearable devices that connect patients and health care service providers remotely.

The system monitor security and safety of domestic environment, personal safety, vital health sign, daily activities, etc. that interactively connects the patients with the doctor regularly and anytime either through telephonic calls, video conferencing, e-medication etc.

A. *Project Requirement Specification*
1) Heartbeat Sensor
2) Temperature Sensor
3) ESP Node MCU
4) Jumper Wires
5) 5v Battery

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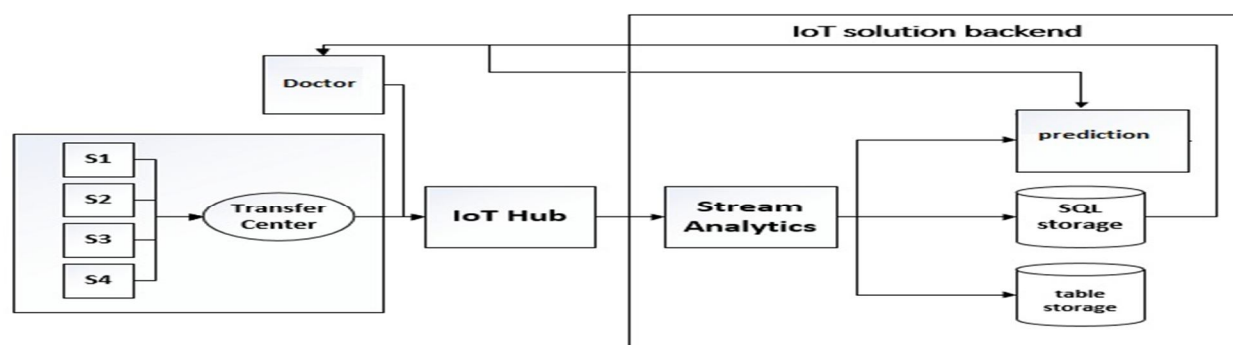
IV. SYSTEM ARCHITECTURE

Figure: System Architecture

With combination of heterogeneous computing system or app and wearable device health of patient can be monitored continuously. Using wide variety of sensors and actuators IoT bot can monitor security and safety of domestic environment, personal safety, vital health sign, daily activities, etc. that interactively connects the patient with the doctor regular basis either through telephonic calls, video conferencing, e-medication, etc. Clinical data is collected using sensors is stored in mobile apps and transmitted to the central database server immediately or periodically through the internet. In case of emergency system can send alarm or can trigger alert to the doctor as well as to their relatives and caregiver for the rapid action of that particular end user[1]. Once the alert message is sent physician can be ready for an emergency backup for the patient and in the meantime the physician can also review the patient's statistics from the submitted medical information of the patient's database stored in the cloud. Fig. shows the interconnection platform and services management to analysis large daily clinical reports like blood pressure (BP), blood sugar, heart rate, body temperature, body weight, etc. that are recorded and saved in the mobile app and central database of elderly healthcare IoT

A. Algorithms

Naive Bayes Algorithm are family of "probabilistic classifiers" used for classification in Machine Learning. Naive Bayes is simple but surprisingly powerful algorithm for prediction. For example, parameters like red colour, round shape, about 3 inches diameter can be considered to identify a fruit as an apple. All of these properties independently contribute to the probability that this fruit is identified as an apple and hence it is known as 'Naive', even though this features relay on each other or upon the existence of the other features. Naive Bayes is mostly used for very large datasets and is easy to build a predictive model. Naive Bayes is known to transcend even highly complicated classification methods. It provides a way of calculating posterior probability P(c—x) from P(c), P(x) and P(x—c). Look at the equation below

Formula: $P(c—x) = (P(x|c) * P(c)) / P(x)$

Where,

P(c—x) is the posterior probability of class (c, target) given predictor (x, attributes).

P(c) is the prior probability of class.

P(x—c) is the likelihood which is the probability of predictor given class.

P(x) is the prior probability of predictor.

V. ACKNOWLEDGMENT

VI. CONCLUSION

This project can provide early treatment and detect danger signs quite early to prevent the need for hospitalization. The length of hospital stay is minimized and the physician and nurses can be connected and monitor the patients based on the report generated by the real time sensors and daily clinical updates by the patient on the database server. It will also help the patient to intervene from any worries hopefully preventing any difficulties when they stay alone in home.

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