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IOT BASED PATIENT HEALTH MONITORING

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Abstract - In India, near about 20% of the total population loses their lives due to intermittent health monitoring system i.e. in most of the hospitals, doctor visits patients in fix time either in morning shift or in evening shift or in both shifts. What happens if patient's health becomes critical in between that time or when a doctor is not available to treat patient. By which a patient may lose their life. So to avoid this grave situation; we are proposing a smart embedded system device which monitors patients health uninterruptedly. This system monitors patients heart rate, body temperature and saline liquid level (if any).if any of the above parameters goes beyond the Yonder value, this smart device informs doctors or care taker and ask for remedial actions to save patients life.

Key Words: IoT, Android, Heartbeat, Mobile Application, Sensors, Health Monitoring.

1.INTRODUCTION

Now-a-days, the medical electronics-sensors (E-sensors) are playing an significant role in health care centres. The patient electronics-health (E-health) monitoring is one of the major progresses in research field. Here we use the temperature sensor, heartbeat sensor and ECG sensor to observe the patient's body temperature, pulse and heart rate respectively.

Hence like the use of thermometer in home to check body temperature before doctor's discussion, this proposed model (devices) can be used to check the patient's health condition in home as first aid information to the concerned patient otherwise nowadays consulting doctors or going to diagnosis centres become very costly in terms of financial aspect.

To overcome this situation, we describe the design of a microcontroller based advanced performance integrated health portable monitoring system. Like one limit say Heart rate of the patient is measured by placing the index finger on IRD (InfraRed Device) sensor and the pulse rate is then measured and displayed on LCD. The device sends messages when the parameter value exceeds the provided cut-off value.

This cut-off value or yonder is given by the programmer during coding of the LPC2148. The standard heart beat ranges among 60100 pulses/min and standard temperature ranges between 18°C to 38°C. The Heart Rate, ECG, Brain tumour and the Body Temperature information is then sent to the authorized person.

In India, near about 20% of the total population loses their lives due to intermittent health monitoring system i.e. in most of the hospitals, doctor visits patients in fix time either in morning shift or in evening shift or in both shifts. What happens if patient's health becomes critical in between that time or when a doctor is not available to treat patient. So to avoid this grave situation; we are proposing a smart embedded system device which monitors patients health uninterruptedly.

OBJECTIVES:

- To monitor the status or condition of the patient.
- To increase system efficiency, the online system is preferred.
- To build up a system fit for observing vital body signs, for example, body temperature, heart rate, pulse rate.

2. LITERATURE SURVEY

A portable physiological checking framework is displayed, which can continuously screen the patient's heartbeat, temperature and other basic parameters of the room. We proposed a continuously checking and control instrument to screen the patient condition and store the patient information's in server based remote correspondence. A remote health monitoring system using IoT is projected where the authorized personal can access these stored data using any IoT platform and based on these values received, the diseases are identified by the doctors from a distance.

A BCI allows its target users like persons with motor incapacities to act on their environment using brain signals without using marginal nerves or muscles. In this review paper, we have presented a opinion on different BCIs for humans with motor disabilities. A Brain-Computer Interface (BCI) is a communication medium, which reorganizes brain signals into respective commands for an external device.

The sEMG signals are exhibited using Cascade Forward Back propagation Neural Network (CFBNN) and Pattern Recognition Neural Network. Methods sEMG signals generated from prime muscles of the participants are composed through an sEMG acquisition system. Based on the sEMG signals, the type of movement attempted by the user is

recognized in the sEMG recognition module using signal processing, feature extraction and machine learning techniques. The information about the recognized movement is passed to microcontroller wherein a control is developed to command the prosthetic hand to emulate the identified movement.

The vehicle robot stops and diverts its direction and returns back to original path, once the obstacle has been overcome. Whenever the robot gets misdirected from the track, the robot automatically calls to the saved number using a GSM module, to indicate emergency. The robot is achieved through the execution of many sensors interacting with the controllers. One of the most obtainable robots in applications are the line followers. These robots normally track either white or a black line. This paper introduces an Autonomous Emergency Indicating Line Follower and Obstacle Evading Robot. The robot moves on a definite path determined by the user and senses the obstacle that comes in its way.

IoT in healthcare is the key player in providing improved medical facilities to the patients and facilitates the doctors and hospitals as well. The proposed system here consists of various medical devices such as sensors and web based or mobile based applications which communicate via network connected devices and supports to monitor and record patients' health data and medical information. The proposed outcome of the paper is to devlop a system to provide world-class medical assistance to the patients even in the remotest areas with no hospitals in their areas by connecting over the internet and grasping information through about their health status via the wearable devices provided in the kit using a raspberry pi microcontroller which would be able to record the patient's heart rate, blood pressure. The system would be smart to intimate the patient's family members and their doctor about the patient's present health status and full medical information in case any medical emergency arises.

Globally, epilepsy is a severe neural disorder happening among 0.6-0.8% of the population. The formation of pattern-change from regular to disturbed factors that all gets triggered at once is called seizure. Many researchers presented different techniques, but the problem of detecting epileptic seizures remains unsolved. This paper presents a new technique for recognition of epileptic seizure-based Electroencephalogram (EEG) signals. The detection scheme acclimates the non-invasive measure of the brain's electrical activity by placing the electrodes on the scalp. The collection of such electrical action and diagnosing is a complex task because the brain is composed of numerous classes with numerous overlying features. Feature extraction based on parametric and non-parametric method is employed to abstract the features vectors from EEG signals. The removed features are forwarded to machine learning algorithms. Feed Forward Neural Network (FFNN) is applied to detect the epileptic seizure.

3. PROPOSED SYSTEM

To develop a device which is interfaced with an Android application so that the heart rate, temperature of body and saline level are monitored efficiently.

The remote health monitoring system described above is entirely dependent on proper communication between the server and client. So it may arise severe condition that server connection gets congested and patient's situation is serious then it creates a problem to recognize the present situation of the patient. For this reason, the main aim of project is to design a portable Android assistant heart rate, body temperature, and saline level monitoring device which is affordable and user-friendly, at the same time low-cost, accurate, and durable.

The framework considerably encompasses the segments like Pulse rate sensor, temperature sensor, saline level sensor, Arduino Uno (ATmega328P) and GSM modem. This introduces a ton of plans that consolidated into the effectiveness of this device in order to reveal required components like cost, plan comprehensive nature, programming innovation, size, weight, deficiency of flexibility etc. This configuration utilizes a scaled down sensors which have been enhanced for extremely precise detecting of changes in the pulse rate, temperature and saline level. The framework of the system with the assistance of the microcontroller is as shown in Fig above. The whole diagrammatic hardware setup is as shown in above fig.1. The components of above subsections are used to make the smart board system to which patient's body parameters are monitored. By using sensors, raw data of patients medical parameters are sensed and transferred to back-end server application using wireless technology.

Mathematical Modelling:

I1: Database Details

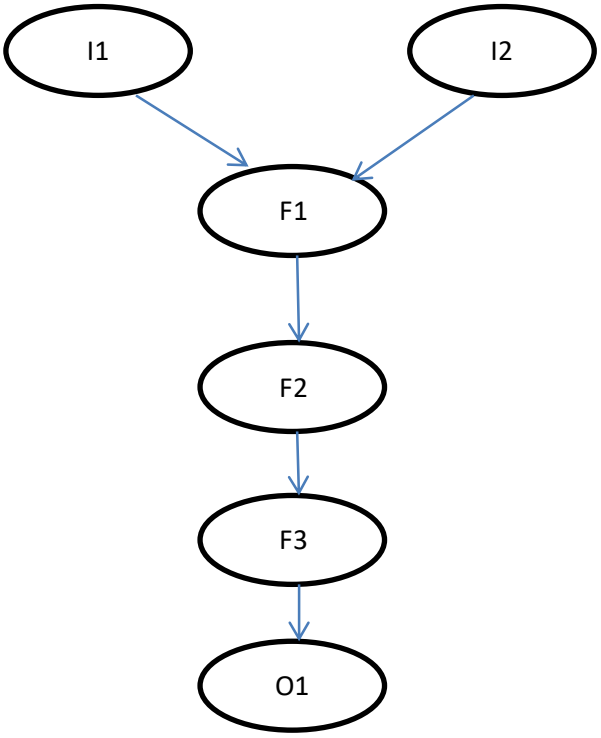
I2: Sensor Inputs

Fn1: Sensor Embedding.

Fn2: Registration

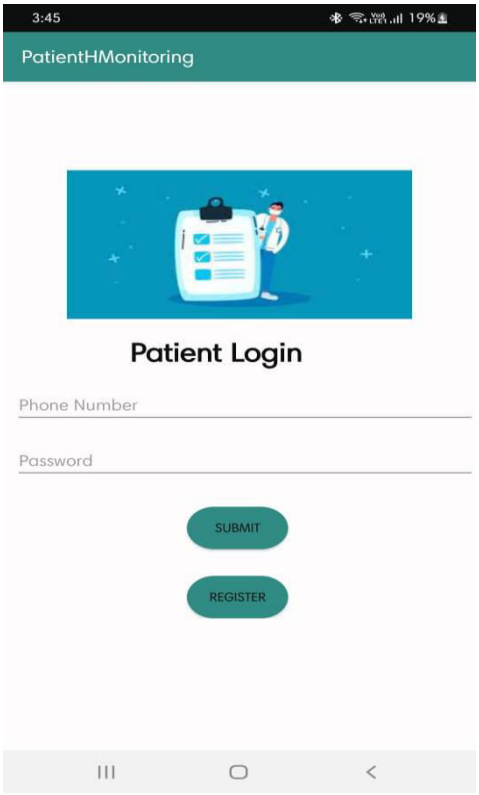
Fn3: Disorder detection.

O1: Alerts



Flow Diagram

RESULT:



Login page

System Description:

Let S be system:

S={I,F,O}

I= {I1, I2} // Inputs

F= {Fn1,Fn2,Fn3,Fn4,Fn5} //Functions

O= {O1}

S: is a System.

I1: Database Details

I2: Sensor Inputs

SE: Sensor Embedding.

DN: Registration

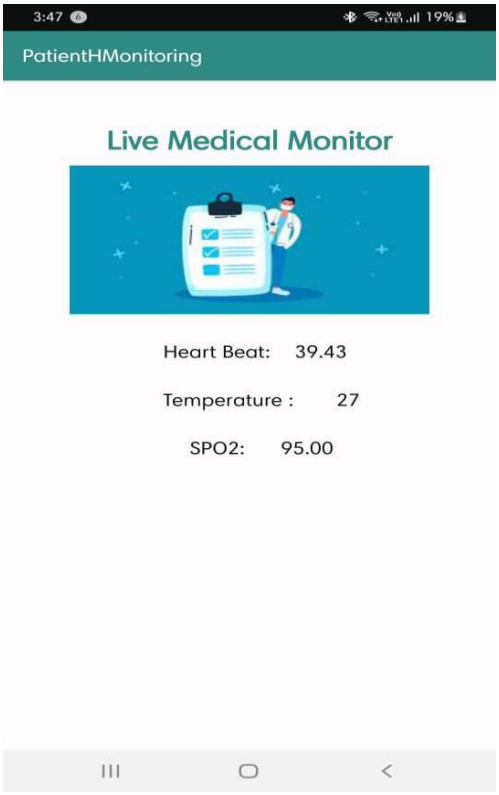
DD: Disorder detection.

TM: Thresholding Matching

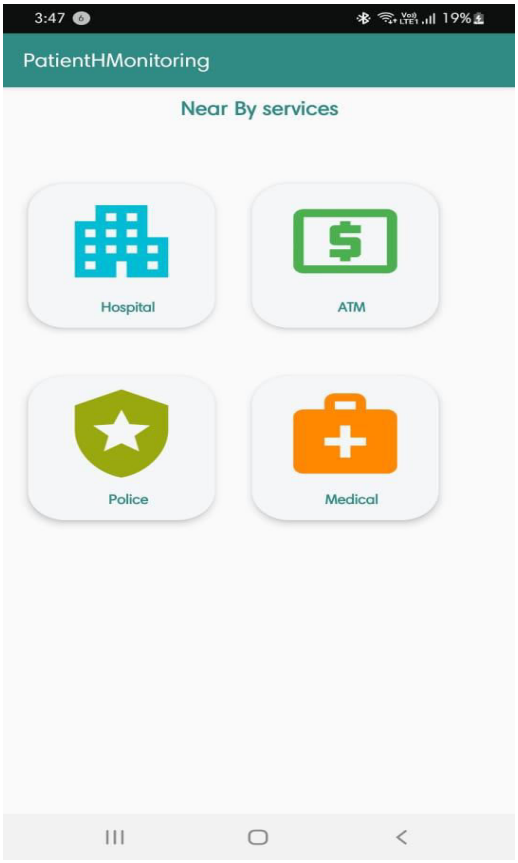
AG: Alerts

Home Screen

Patient Info



Medical Status of patient



Near By services

CONCLUSIONS

To implement Arduino UNO and Wireless Based Wireless Health monitoring system is the enhanced technology as compare to the existing technology because it sends the SMS quickly, easy to use, also it can work in longer distances at a very low cost. It sends measured heart rate (heart beat), body temperature and saline level to the doctor so if any critical situation happens in patient's biomedical parameters then doctors can easily take action.

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