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IoT BASED E-PROGNOSIS SYSTEM

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Abstract - *One of the major concerns that is still posing as a challenge is a disability. The person with a disability has to be monitored by the caretaker, but it is impossible to look after them always. This is about E-PROGNOSIS SYSTEM based on IoT (Internet of Things). The term BAN (Body Area Network) refers to the system where communication is entirely within, on and in the immediate proximity of a human body. Doctors use various medical apparatus to predict diseases but, ECG, EEG, BP, Temperature and Heart beat can be predicted using sensors. It is possible to connect the wearable devices (sensors) on the human body, to the internet. The medical professionals can access the medical data online using the internet. In this system temperature and heartbeat are considered. The system measures the parameters of the patient and when there is a constant rise in temperature its diagnosis itself then it sends the information and remedy to be taken to the patient, care taker or doctor via IoT.*

Key Words*: *BAN, Sensor, Diagnosis, Prognosis, Parameters

1. INTRODUCTION

In today's world, physically challenged person & old aged people depend on the caretaker. The purpose of this project is to design & develop IOT based e- prognosis system. The aim of this work is to help the disabled person without the help of a caretaker. So, this system introduces the term BAN (Body Area Network) came to refer to the system where communication is entirely within, on and in the immediate proximity of a human body. It is possible to connect the wearable devices on the human body to the internet. Doctor's use various medical apparatus to predict diseases but, ECG, EEG, BP, Temperature and heart beat can be predicted using sensors.

1.1 OBJECTIVE

This project mainly focuses on to avoid errors in diagnosing by various existing applications and software. A protocol is designed to monitor the parameters and gives a diagnosis in case of abnormality to make this protocol (EEG, ECG, BP, Temperature, and Heartbeat) compact, BAN is implemented.

1.2 BENEFITS

Easy to implement, more flexible, no distance limited for information sharing, reduce man power, reduce waiting in hospitals, much needed for physically challenged /aged people/ infants.

1.3 CHALLENGES

Treatment process takes a long time (much more than expected) for each patient waiting in the queue or pending list, Due to heterogeneity, difficult to automate the learning steps involved in process mining, Low-support, Low-confidence, Time consuming and there are several interpretations possible, it is not being exploited to detect eventualities in hospital processes.

2. LITERATURE SURVEY

[1] Medical Image Classification Based on Deep Features Extracted by Deep Model and Statistic Feature Fusion with Multilayer Perceptron LAI, Z.;DENG,H. Computational Intelligence and Neuroscience 2018: 2061516 2018

Medical Image Classification Based on Deep Features Extracted by Deep Model and Statistic Feature Fusion with Multilayer Perceptron, The system is designed to realize unsupervised learning by obtaining representative and global fused features with fewer noises and by building pixel-by-pixel mapping between the two source data. it is used to evaluate the effectiveness of the proposed framework, experiments on two MHSI data sets are implemented.

[2] Shickel B, Tighe PJ, Bihorac A, Deep RP. EHR: a survey of recent advances in deep learning techniques for electronic health record (EHR) analysis. IEEE journal of biomedical and health informatics; 2018.

The system provides tight link between decision supporting knowledge and specific patient data. it is used to diagnosis and to give remedy to the patient.

[3] Ravı D. Wong C, Deligianni F, Berthelot M, Andreu-Perez J, Lo B, Yang G-Z. Deep learning for health informatics. IEEE journal of biomedical and health informatics; 2017(21):4–21.

Focuses on rapid improvements of computational power, fast data storage, and parallelization and it is used for providing a critical analysis of the relative merit, and potential pitfalls of the technique as well as its future outlook.

[4] R. Miclo, F. Fontanili, G. Marquié, P. Bornert, M.Lauras "RTLS-based Process Mining: Towards an Automatic Process Diagnosis in Healthcare" AUGUST 2015 IEEE International Conference on Automation Science and Engineering (CASE).

In this system log files are the main data source to use a Process Mining tool. In this Process Mining of data, the patient pathways in an external consulting service of a hospital center. Apart from this the patient details are at the front desk, the information system does not collect enough events in order to manage the model in details of different patient pathways. An accurate diagnosis can be enabled in numerous and fast input data treatment, automatic process modeling and output data.

3. MODULE DESCRIPTION

The modules of the proposed system are based on the two cases,

a. Server Module

b. Sensor Module

a. Server Module

Server receives the data from hardware and publishes in the webpage. SQL is used in the back end to store and retrieve the database

b. Sensor Module

Here temperature and heartbeat sensor are taken for measuring the parameters. The Temperature sensor is a temperature sensing device for solid state that acts a little like an electrical resistor which is temperature sensitive. It is used to produce an analogue output voltage with variations in ambient temperature and it can be referred as a transducer. Due to physical changes in heat it creates a change in its electrical properties. There exist many ways to measure heart rate and the easiest way is using a Heartbeat Sensor. The principle behind this Sensor is Photo plethysmograph. According to this principle, the change in the volume of blood is measured by the change in the intensity of the light passing. The source of light would be an IR LED and may contain any Photo detector like a Photo Diode, an LDR (Light Dependent Resistor) or a Photo Transistor. By these light source and detector, a transmitive Sensor and a reflective Sensor can be arranged. The light source and the detector are facing towards each other and the fingers have to be placed in between the transmitter and receiver. The temperature sensor and heartbeat sensor measure the data and gives it to Arduino module. In Arduino it analyses the data and diagnosis the result. Then the data is sent to the server.

4. SYSTEM DESIGN

The model consists of Arduino UNO, heart beat sensor, temperature sensor.

4.1 ARCHITECTURAL DESIGN

To measure the parameters, temperature and heart beat sensors are considered. Both the sensors are connected to Arduino UNO. This figure (Fig 1) shows about the connection between the sensors and the Arduino board. The Arduino is connected to the sensors. Liclipse, is used in the front end and SQL is used in the back end. The SQL collects the data from the sensors and stores the data (medical parameters). If there exists a constant rise in the parameters considered remedy to be considered is sent which is accurate as it is the diagnosis of their own. In case of abnormality it intimates via buzzer alarm and sends a mail to the caretaker/ doctor.

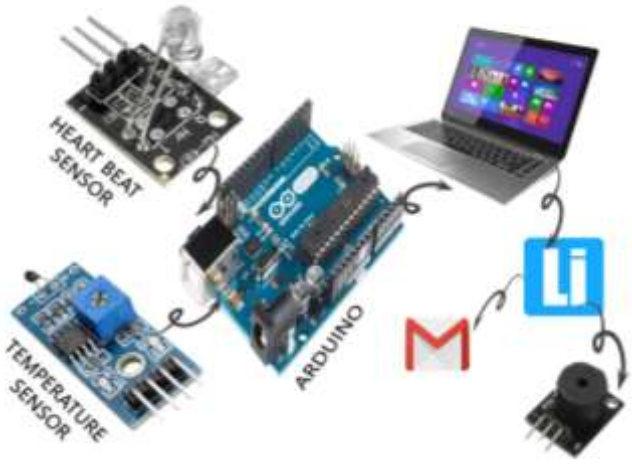

Fig 1: Architecture Diagram

5. CONCLUSION

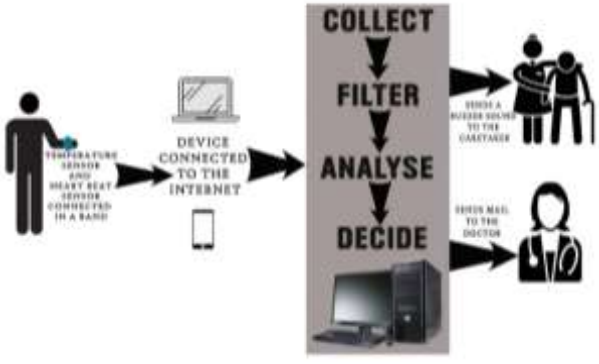

Fig 2: Body Area Network Connections

For active and assisted living healthcare applications, a low-power wearable IoT system is used. It summarizes the main components of the proposed system and explains their detailed implementation. To illustrate the different performance aspects of the proposed system a prototype is built (Fig 2). Despite being a low-cost one, the initial performance evaluation results have demonstrated the efficiency of the proposed system, which makes it a good system for implementing a wide set of wearable healthcare in living health care applications.

5.1 FUTURE WORK

Like temperature and heartbeat, ECG, EEG and BP are monitored using sensors which could be implemented in wearable devices by using BAN (Body Area Network) concept. For real time applications Bigdata is used and different algorithms are used for different kinds of data (Fig 3).

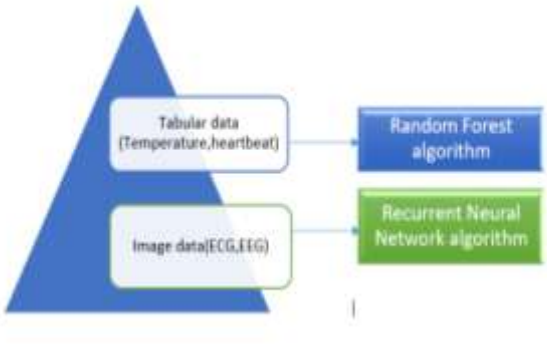

Fig 3: Future Scope

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