

## Artificial Intelligence In Personal Health Monitoring

Purna Raul<sup>1</sup>, Purvesh Desai<sup>2</sup>, Tushar Chittikappil<sup>3</sup>, Mahalaxmi Palinje<sup>4</sup>

<sup>1</sup>(Department of Electronics & Telecommunication, ACE, Mumbai University, India)

<sup>2</sup>(Department of Electronics & Telecommunication, ACE, Mumbai University, India)

<sup>3</sup>(Department of Electronics & Telecommunication, ACE, Mumbai University, India)

<sup>4</sup>(Department of Electronics & Telecommunication, ACE, Mumbai University, India)

**ABSTRACT:** The main emphasis of health monitoring system is to accurately identify the current state. In Artificial intelligence (AI) the machine learning algorithm gives further guidelines and tips for success to increases the survival rates. During the treatment of patient, it is important to monitor the physiological signals of the patient. While data storage is another major challenges, designing technical solutions that can be smoothly implemented and stored daily data of patient, the solution is proposed a software based health monitoring system. Physiological signals which includes heart rate, temperature etc are important signals and they are captured by using sensors. The data which is given as an input is in raw form and it is converted into digital form. Digitally stored file is compare with live data. Then the change in large or small scale it will detect and the compared result data will be stored in graphical form. Which helps doctor to analyses patient's data and the result will also be display on device of patient along with the precautionary measures to avoid major incident. Also AI can find patterns in the treatment process to guide doctor in better caring for patient by looking into outcome and data from past treatments.

### I. Introduction

Many healthcare organizations all over world are busy in serving people with best healthcare service. Nowadays people pay more attention on their health. People wants more efficient and compatible healthcare service. For more compatibility and accuracy for patient data analysis we use AI[1]. The main objective of this project is to provide personal healthcare data to individual people at daily basis without consulting to doctor for their health. How to provide personal healthcare analysis to more people with high accuracy becomes a key issue. AI does the prediction and comparing part and then it stores the patient daily data analysis using cloud in graphical format. In future if the patient consults the doctor this weekly data stored can help in many ways to both and save time[10]. This data stored can be easily accessed using token ID. This is used for individual purpose. To this result, this paper proposes a system which will provide daily basis healthcare analysis will be stored in graphical form which will help person solving their health problem.

### II. Design Of The Proposed System

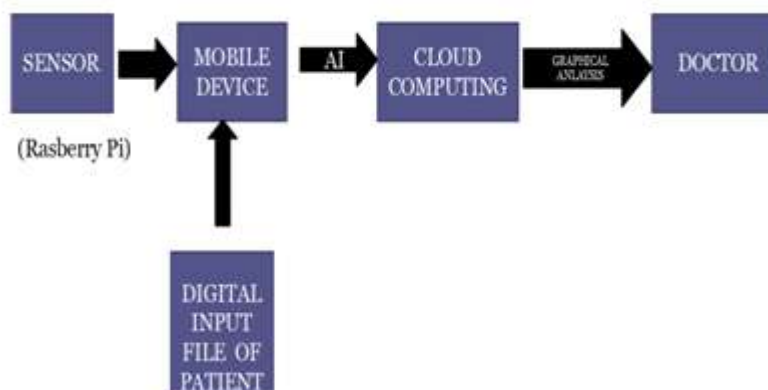


Fig. 1 BLOCK DIAGRAM OF AI HEALTH MONITORING SYSTEM

It is in general block diagram of the designing health monitoring system. In which the raspberry pi is used as a hardware through which sensors are connected. Then the sensor data transfer to the device in which the patient previous health data is already stored. Using machine learning algorithm this data is analysed[2].

Through the cloud computing and artificial intelligence we compared and predicted solution is stored in graphical format[6].Cloud have many advantages such as capacity of storage and speed transfer information[7]. Which can see by doctor for the patient treatment[1]

### **III. Hardware Assembly**

#### **POWER SUPPLY**



**Fig.2 Power supply**

Raspberry pi 3 is powered by +5.1v micro usb supply. For model B the peripheral supply is 700-1000mA.It depends on sensors which we are connecting

#### **RASPBERRY PI BOARD**



**Fig.3 Raspberry pi 3**

Raspberry pi3 B+ model has 64 bits,1.4 GHz hardcore processor, 1 GB RAM, dual band wireless chip. 802.11 b/g/n/ac wireless LAN. Dual band 2.4 GHz to 5 GHz wireless LAN for less interface and higher bandwidth[4].

#### **SD CARD-**



**Fig.4 SD Card**

Flash card used is 16 GB storage. It is class 10 type of SD card is used

#### **IR SENSOR**



**Fig.5 IR sensor**

A sensor is a instrument that detects presence of close objects. We are using this sensor to detection of the connection of other sensor is going to work in our project. It is basically person presence sensor.

#### **TEMPERATURE AND HUMIDITY SENSOR**



**Fig. 6 DHT11 sensor**

DTH 11 model is used for sensing body temperature and humidity of a patient. It is one way data flow from sensor to raspberry pi3 model.[5].



Fig. 3.6 Gyroscope sensor

3.6 Gyroscope sensor- In physics we know the rotational motion of body. The gyroscope is a device which use to sense the angular and rotational motion of person in which we sense the how much speedly the motion of the person angularly moving from the axis of his body



Fig.3.7 Heartbeat sensor

3.7 Heart beat sensor- The sensor is use to check blood flow of a person using photodiode and send the LED signal to the Rpi if the blood flow is abnormal for some time[5].

#### IV. Proposed Methodology

Monitoring health in daily basis, in which the sensors play an important role. Raspberry pi3 connecting heart rate sensor, temperature and humidity sensor, IR sensor, gyro sensor. In which the O.S. booting is taken place[4]. Each sensor is give different numeric value, this value is store in different variable. All the sensor data is collected by Rpi data is transfer to the Thing speak cloud. This cloud store and formed that data in graphical format[6].



Fig.4.1 Experimental graphical chart of temperature sensor.



Fig.4. 2 Heart rate monitoring sensor graphical format.

AI plays an important role in monitoring for that we are using R language. There are two type of reasoning methods[3]. The sensors values are in numeric format. Due to which for analysis of data using R language is done by multiple regression method. In which the sensor data is compared with respect to the health of the patient. If we take 2 or more sensors at the same time like temperature humidity, hearth rate both shows 2% increase. The constant variable health shows the overall increase 4%. Then the overall perdition part is done using this increased health value in which we use multiple regression[9]. In comparing patient data Thing speak cloud use two type of method[6]. The seven days data analysis file or complete training data of thousand to two thousand people. This compared data then give the expected result to the patient is text format. Due to which it helps patient in his further health related decision.

## **V. Advantages**

- 5.1 Medical diagnosis
- 5.2 Mental and physical health screening
- 5.3 Medical research
- 5.4 Help in rare medical condition
- 5.5 Virtual presence
- 5.6 Cost reduction

## **VI. Application**

- 6.1 Drug discovery
- 6.2 Assist in medical surgery
- 6.3 Generating reminders and alerts
- 6.4 Therapy planning
- 6.5 AI enabled treatment plan

## **VII. Future Scope**

Together the synergy of new technologies, with the help of big data and AI is to combat the disease prone diaspora of India. The key is to ensure that majority of the population can access and therefore benefit from this technological disruption.

## **VIII. Conclusion**

The proposed system provides normal health check up using AI in medical field by wearable device. It analyses patient's physiological changes in digitalized way and gives appropriate results, this AI can improve itself by analysing data and give precise predictions automatically. The system makes use of single board minicomputer Raspberry pi and Think speak cloud for digitalizing getting and storing the analysed data,for health check up we use appropriate sensors. The system is addressing the society challenge of health monitoring of busy people who cannot visit doctor because of their day to day work, for their comfort this will help in improving the quality of life of himself leading to a longer and a healthy life by adding blood pressure sensor, temperature sensor, gyro sensor, IR sensor, the system can turn into a complete health monitoring system. The network systems have to ensure that the data generated by the devices should be accessed only by the authenticated individuals by involving security controls like authentication by using token id.

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