

Remote Health Monitoring & Security System for Elderly People using Raspberry

MHNV Prasad, P Munaswamy

Abstract: It is extremely important to monitor various parameters in medical field and post operational information. To get the patient's medical parameters over local and remote area, healthcare correspondence utilizing internet of things (IoT) system will be adjusted. The primary goal about this project is on transmitting the patient's health screening parameters through remote correspondence. These data information would upload to cloud server furthermore transmitted of the workstation also versatile to crew Also doctor's reference. Developments for data and correspondence innovations bring prompted the development from utilizing internet of things (IoT). In the up to date human services environment, the utilization about IoT innovations acquires comfort about medical practitioners and patients, since they are connected on different therapeutic ranges (such concerning illustration ongoing monitoring, tolerant data management, and healthcare management). That body sensor network technology in engineering organization will be a standout among those advancing of IoT developments to healthcare system, the place a patient can be monitored utilizing an accumulation about small powered lightweight remote sensor nodes. However, that improvement of this new innovation in healthcare applications without acknowledging security makes patient privacy defenseless.

Keywords: Raspberry pi, Heartbeat Sensor, Temperature Sensor, Pi camera, Speaker.

I. INTRODUCTION

The body sensor system (BSN) innovation [5] may be a standout among the greater part extremely critical innovations which would utilized within IoT-based cutting edge social insurance framework. It is essentially an accumulation from claiming low-power Furthermore lightweight remote sensor hubs that are used to screen that human body capacity Furthermore encompassing nature's domain. Since BSN hubs need aid used to gather information delicate (life critical) data Furthermore might work previously, dangerous environments, accordingly, they oblige strict security components with forestall pernicious association with the framework. Those social insurance remote following frameworks bring get to be a magic donor of the change of the elderly people' caliber of existence.

That business segment of social insurance remote observing frameworks need expanded altogether because of a few reasons. Those amount for elderly individuals will be climbing All the more the place today On propelled nations it is altogether ordinary that elderly people normally survive freely clinched alongside own property houses. To instance, healthcare for individual analyzers for example, such that advanced smart beds naturally tell that who are involving them and even actually more, they have the capacity that illuminate something like different patients physiological levels, making true advanced smart home medication dispensers to, for instance, naturally caution when solution will be not taken. A few healthcare remote following frameworks utilize distinctive innovation technology to follow or track patients or biomedical equipment inside hospitals and in their homes. This project recommend an IoT-aware construction modeling for healthcare remote screening frameworks to patients at home (suffering constant ailments Also alternately disabilities), which permits Throughout runtime including new sensors that ended up promptly accessible in place clients might create/edit alerts' guidelines utilizing also these new information.

II. EXISTING METHOD

Existing schemes only concentrates on monitoring Health using sensors. Sensors procure that information about Different parameters viewing patients' health, and the web from claiming things saves that information Furthermore shows through that website, which gives entry to remote observing. Utilization of sensor diminishes that mankind's error, and the size of the framework lessens those possessed space of the room. Alternate useful territory of the framework will be those plans of sending the notice through email and SMS caution if any of the health parameters crosses those edge worth. Notice plan will stay with the particular power aware of the circumstance.

III. PROPOSED METHOD

Existing system does not addressing the security features. Security is primary aspect of the elderly persons living in home, so in this project a new method is proposed a method to provide security, along with health monitoring. The security is provided by monitoring door steps with camera. It captures the image of the person who is entering the home .

Revised Manuscript Received on 30 May 2019.

* Correspondence Author

MHNV Prasad*, PG student, Dept. of ECE, Institute of Aeronautical Engineering, Hyderabad, India

P Munaswamy, Professor, Dept. of ECE, Institute of Aeronautical Engineering, Hyderabad, India

© The Authors. Published by Blue Eyes Intelligence Engineering and Sciences Publication (BEIESP). This is an [open access](http://creativecommons.org/licenses/by-nc-nd/4.0/) article under the CC-BY-NC-ND license <http://creativecommons.org/licenses/by-nc-nd/4.0/>

Remote Health Monitoring & Security System for Elderly People using Raspberry

The captured image will be correlated with the existing saved images in data base and authorized to enter and voice alert is given to the person inside. The database of the voice module will voice out the name of the person otherwise it will just say that the person is unknown. The unknown people image will be saved in data base for any further diagnosis.

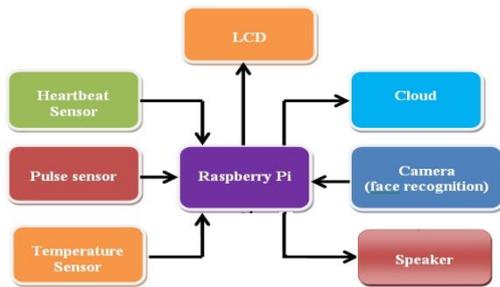


Figure.1. System Block Diagram

Heart Rate Sensor

Those MAX30100 will be an incorporated pulse oximetry Also heart- rate screen sensor result. It is a combination of a photograph detector, optimized optics, also low-noise simple sign transforming should recognize pulse oximetry and heart-rate signs. The MAX30100 works starting with 1.8V Furthermore 3.3V energy supplies Also might make mechanical down through product with unimportant support current, permit those energy contribute with continue joined in the least times.



Figure.2. Heart Rate sensor

Temperature Sensor

The MAX30100 need an on-chip temperature sensor to (optionally) calibrating the temperature reliance of the SpO2 subsystem. The SpO2 algorithm will be generally uncaring of the wave- period of the IR LED, yet the red LED's wavelength may be incredulous right understanding of the information. That temperature sensor information might make used to adjust those SpO2 slip with encompassing temperature progressions.

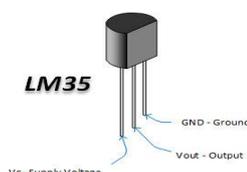


Figure.3. Temperature sensor

Pulse sensor working:

The attempting of the Pulse might be greatly essential. The individual's sensor necessity two sides for particular case side the individuals headed is set nearby a including light sensor and on the distinctive side we compelling reason a rate wandering. This wandering will a chance to be liable for that increased besides noise ascertained worth from claiming exertion. The individuals headed on the front side of the sensor might a chance to be set through a vein previously, our human body. This may perhaps an opportunity to a chance to be your finger tip or you ear tips, make that it ought should be situated clearly for most elevated necessity around a vein.



Figure.4. Pulse sensor

Flow Chart

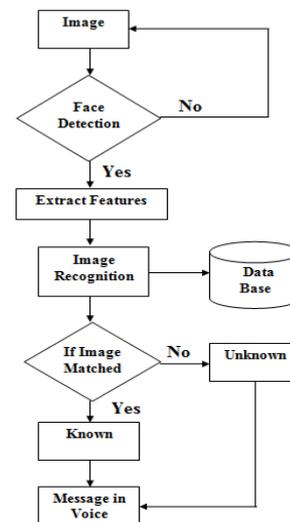


Figure.5. Flow chart

Experimental Results

Our project includes a camera module which is placed outside the door. When a person stands in front of the door, the camera module detects the features of the person and compares it with the datasets in database. If



Figure.8. Data monitoring using IoT

the image matches with any of the image in database, the module placed at home will say the name of the person, otherwise it will say that the person is unknown. All these parameters can be viewed on a monitor screen and the Data to cloud. The authorized

As shown in figure 7 continuously monitoring from Pulse, Temperature & Heartbeat

As in figure 8 data Collected from Thing Speak image Waveforms

Dataset of Known person 1:

```
Python 3.5.3 Shell
-----
Pulse: 98.0
Temp : 100.23 F
Heart Beat : 80 bpm
b'0'
-----
Pulse: 98.0
Temp : 100.03 F
Heart Beat : 88 bpm
b'0'
-----
Pulse: 98.0
Temp : 99.76 F
Heart Beat : 88 bpm
b'0'
-----
Pulse: 98.0
Temp : 99.69 F
Heart Beat : 88 bpm
b'0'
-----
Pulse: 98.0
Temp : 99.62 F
Heart Beat : 96 bpm
b'0'
-----
Pulse: 98.0
Temp : 99.55 F
Heart Beat : 72 bpm
b'253'
-----
Pulse: 98.0
Temp : 99.48 F
Heart Beat : 80 bpm
b'0'
-----
Pulse: 98.0
Temp : 99.42 F
Heart Beat : 96 bpm
```

Figure .7. Monitoring the data

person can view the progress in graphical format using Thing speak. The following Table shows the Idle and practical testing values.

S.No	Sensors	Idle Case	Practical Case
1	Temperature	98%	101%
2	Pulse	98.6F	102.82F
3	Heartbeat	88Bpm	96Bpm

Tble.1. Sensor Values

As shown in figure 6 LCD Display shows the Output values in idle mode



Figure.6. Hardware setup

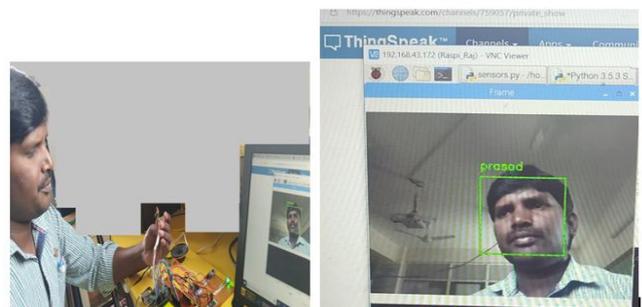


Figure.9. Camera detecting person 1

Camera for Face recognition (Security System)

The security is provided by monitoring door steps with camera, camera module which will be placed outside the door. It will continuously keep tracking and detecting the person standing in front of the camera. Furthermore, it will extract the features and start comparing with the images stored in the database. If the person's picture is already saved in the database, a voice module will tell the name of the person, otherwise it will say that the person is unknown. The image also viewed on a monitor screen is the person known or unknown. The unknown people image will be saved in data base for any further diagnosis.

Dataset of Known person 2:



Figure.10. Camera detecting person 2

Dataset detected Unknown person 3:

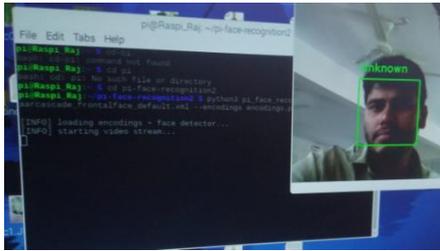


Figure.11. Camera detecting person 3

The first picture shows the set-up of our project, where the raspberry pi is connected to the system. The camera module and ear plugs are connected to raspberry pi. In this, the camera module is searching for a person standing in front of it. After checking with all the pictures in the database, the person is recognized. Here, the camera is detecting multiple people, a known person and an unknown person

IV. CONCLUSION

Internet of things needs numerous provisions in distinctive ranges. IoT need been now outlined for form remote sensor organize. It need been produced to health screening. This framework displays those building design for IoT Furthermore building design of remote health following utilizing IoT. There are a percentage issues discovered done IoT and existing health observing. New advances Might help on minimize them by accomplishing the exceptional caliber and also web built security idea. This framework displays the issues Furthermore tests that Might turn. New innovations Furthermore methodologies which would generally used to move forward provisions for IoT bring been talked about in this one task. Raspberry Pi kit, Wi-Fi modules, temperature, blood pressure, pulse oximeter, heart beat rate sensors are presently Previously, utilized for IoT.

REFERENCES

1. Darshan K R, Anandakumar K R-“A Comprehensive Review on Usage of Internet of Things (IoT) in Healthcare System” Department of Computer Science & Engineering, SJBIT, Bengaluru .Visvesvaraya Technological University, Belagavi Karnataka, India.
2. Ngo Manh Khoi, Saguna Saguna, Karan Mitra and Christer A° hlund-“System for IReHMo: An Efficient IoT-Based Remote Health Monitoring Smart Regions” Luleå University of Technology Skellefteå , Sweden©2015 IEEE
3. Punit Gupta1, Deepika Agrawal2, Jasmeet Chhabra3, Pulkit Kumar Dhir4-“ IoT based Smart HealthCare Kit” Jaypee University of Information Technology .Himachal Pradesh, India©2016 IEEE
4. Juha Petäjäjärvi, Konstantin Mikhaylov, Matti Hämäläinen, Jari Iinatti-“ Evaluation of LoRa LPWAN Technology for Remote Health and Health Monitoring” Centre for Wireless Communications department of Communications Engineering, University of Oulu, Finland.
5. Tawachi NYASULU –“Smart Under-Five Health Care System” University of Leeds, Woodhouse Lane, Leeds, LS2 9JT, United Kingdom © 2016 The authors.
6. Ding Ding, Mauro Conti, Agusti Solanas-” A Smart Health Application and its Related Privacy Issues” University of Padualtaly, Rovira i Virgili University Spainc 2016 European Union.
7. Vandana Milind Rohokale-“ A Cooperative Internet of Things (IoT) for Rural Healthcare Monitoring and Control” Center for TeleInfrastruktur, Aalborg University, Denmark ©2011 IEEE

8. Hariiprasad Anumala-“ Distributed Device Health Platform using Internet of Things devices” Samsung Research Institute India Pvt Ltd Bangalore, India