Monitoring of Elderly/Blind Patients Health Remotely Through Wearable Sensors

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Abstract: The paper represents how to monitor health remotely by the use wearable sensors, mainly and care holders. Serviceable sensors will assist elderly persons for self-sustaining who are living alone in their homes. This approach focusing on the welfare of elderly persons. There is a drastic change in technology and modern style of coping paradigm authorize coexistent acquisition, computing and keep an eye on activities in home automation. The system given specific features can be serviceable gadgets to behold the complete health prime of the patient and an automation application software for relatives will decrease expenses incurred for maintaining health and health practitioner's burden in attentive units. Moreover, it also helpful for relatives to keep an eye on activities of elder person, whenever, they are on the outside from habitation.

Index Terms— Arduino Uno, Internet of Things, Telegram, Wearable sensors

I. INTRODUCTION

In frequent years, people give more importance to their work or passion than taking care of their health along with their parent's health. Elderly people and adults sometimes may forget to take medicines at proper time. If this happens multiple times may lead to deterioration of health. In this paper we propose a method to overcome these types of situations by providing reminders to such people regarding their medicines and giving them the instructions on correct time and amount. Here physical and digital reminders are combined to provide help to such people. Aim is to concentrate more on helping elderly people to take their medicine in time with correct dosage.

In today's fast-growing world elderly people and patients need a solution to carry out their daily responsibilities independently without anyone's help. The wireless and IoT technologies advancement offers a solution to make life easier and more beautiful so that elderly people can live a quality and happy life by taking their medications on time.

As the population of aging people are increasing in the society, we need to take care of elderly people but that we cannot do sometimes because of our busy schedules. So, in this paper we aim at providing an independent and quality life to elderly persons who are living alone.

II. RELATED WORK

Taking care of elderly people is important thing, which makes difficulties for young generation as they are busy with their life and passionate things to do, at the same time they need to take care of elderly people. This leads to difficulties for young generation who are struggling so here they introduced some of the application through which they can keep an eye on their elderly people health and medications.

In this paper a health monitoring system based on mobile application was proposed. The system proposed the access of patient's location and heart rate status by doctors and patient's relatives. The heart rate signal is measured in the proposed model using pulse sensor and then it is transmitted via Bluetooth wireless connection to smart phone. The proposed system for real-time geolocation tracking utilizes the internal GPS sensor. Then to send the obtained geolocation an alarm mechanism is a developed to deliver first aid if some emergency situations arise. A module is added for messaging with the doctor [1].

The main conclusion to be drawn from this study is their system used three health sensors: body temperature sensor, heart pulse sensor and galvanic skin response sensor. By combining Arduino Uno and Raspberry Pi, all three sensors were merged into a single system. The data collected from the sensors is sent to a cloud storage through the Raspberry Pi. The cloud storage is updated continuously in real time. Then by using Android Studio they developed an Android application to access the

database and show the health parameters in graphical representation. In order to understand the functioning of the sensors used, a detailed analysis of the signals was then obtained with respect to variations in physical and environmental activities [2].

The aim here is to provide health monitoring with minimal location and time constraint for the elderly [4]. In this study a cloud-based inte1ligent and secure Smart home structure for elderly individuals is presented [3].

The major conclusion drawn from the paper is, the system tracks and analyze activity of senior citizen biometric data which includes pulse, weight, and blood pressure. The number of steps the seniors have taken over few weeks were tracked. This data is analyzed to find if whether increase in physical activities by senior citizens has a positive effect on the vital signs of older adults [5].
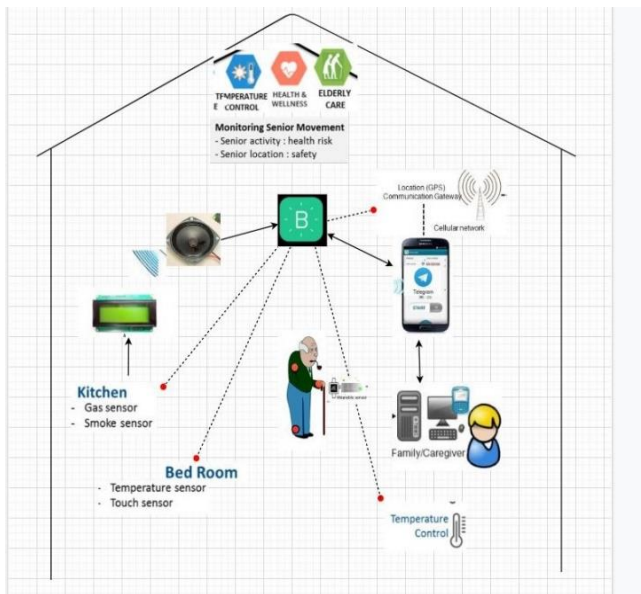
III. PROPOSED MODEL

Fig 1: Proposed model

In the above fig. 1, LCD (liquid crystal display) is used to display some of the instruction to guide the elder person. Next the touch sensor is used for the instructing the blind elder person like about the things to carry while going out and the touch sensor is attached in the slipper of the blind elder person. Then the temperature sensor is used for the detecting the temperature of the elderly person home is normal or not. Gas sensor is used to detect if any harmful gas is present in the house of the elder person. Then the

APR module is used to store voice which are used to instruct the blind elder person. Next Node MCU is used in this project to connect all the device and sensor through Arduino which is of 16 pins. And the last but one the Telegram is used for the send the alert message to the caretaker and blink is used as a database in this project.

IV. MATERIALS USED

A. Hardware requirements:

1) Arduino Uno

Fig 2: Arduino Uno

Arduino Uno (16-bit) shown in fig. 2 is a microcontroller and the platform where many of the sensors can be mounted and the required data can be fetched through those sensors.
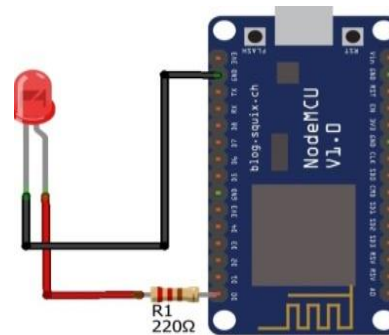
2) NodeMCU

Fig 3: NodeMCU unit

Above fig 3. shows NodeMCU unit. It is a wi-fi device and includes a firmware that runs on ESP8266 Wi-fi. It is a low cost and an open source device. NodeMCU provides access to General Input/output pins.

3) IR Sensors

Fig 4: IR sensor

Above fig 4. Shows IR sensor. It is a sensor which is used to sense the characteristics of its surrounding. They also emit or detect certain radiations. They are most widely used in environmental checks and can also detect the various heat leaks and chemicals

4) Touch sensors

Fig 5: Touch sensor

Touch sensor shown in fig. 5 is a small, simple and a low-cost electronic sensor which is used to detect and record the physical touch.

5) Gas sensors

Fig 6: Gas Sensor

Gas sensor shown in fig. 6 is very helpful as a safety measure which detects the gas leaks. The results obtained from these are sent to the microcontroller.

6) Temperature sensors

Fig 7: Temprature Sensor

Above fig 6. shows temperature sensor. These sensors measure the temperature and allow them to detect the temperature changes of the surroundings and convert these changes to data form.

7) APR 9600

Fig 8: APR 9600

The APR shown in fig. 8 is a low-cost high-performance device in which record/replay of the IC occurs. Even after the power supply is removed from the module, the recorded sound is retained.

B. Software requirements:

1) Telegram Bot

Users can interact with the bots by sending messages. A telegram bot is an application hosted on the server and uses telegram Bot APIs to connect to the messenger clients

2) Blynk

Blynk is an ideal platform to control arduino and the other devices via the internet. The blynk can be used to read, store and visualize the data and can control the hardware remotely

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3) Embedded C

Embedded C is the extension of C and is usually used in the embedded systems which are integrated together and performs operations
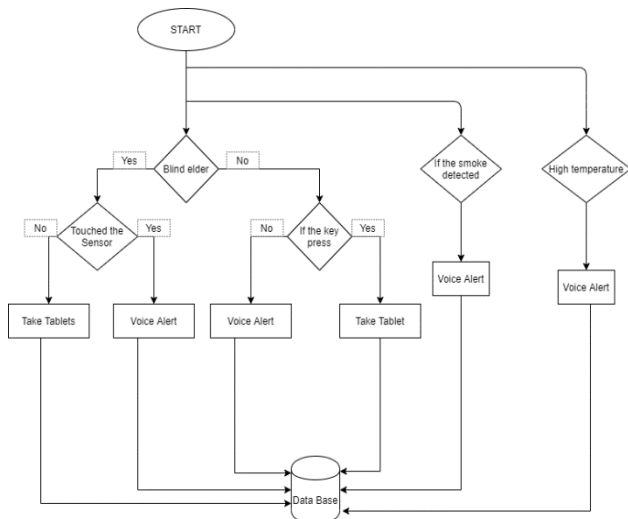
V. METHODOLOGY

Fig 9: Flow of the project.

In this section we are discussing about the flow of the project shown in fig. 9. Here we have blind elder person if it is yes then we have a touch sensor to them to instruct their daily activities like here if the sensor is been sense from the blind elder person then the voice alert will be given to the elder blind person.

If the elder person is not blind then we have a button to be pressed if the elder person press the button after his daily activity is done like for example here after taking his tablet and then it is given for the database if not then it gives a voice alert like please take your tablets.

If any smoke is detected in the house of the elder person then for the elder person it gives a voice alert, Even the elder person is blind or non-blind.

Then we find any temperature variations are there in the house of the elder person then for the elder person it gives alert message like temperature is the height. Even the elder person is blind or non-blind also give voice alert.

All the data are been stored in a database here we are using a blynk has a database in this project

VI. DESIGN AND RESULTS

In this part we are discussing about the design and the outcomes of the "Elderly person monitoring system. This system has two sectors.
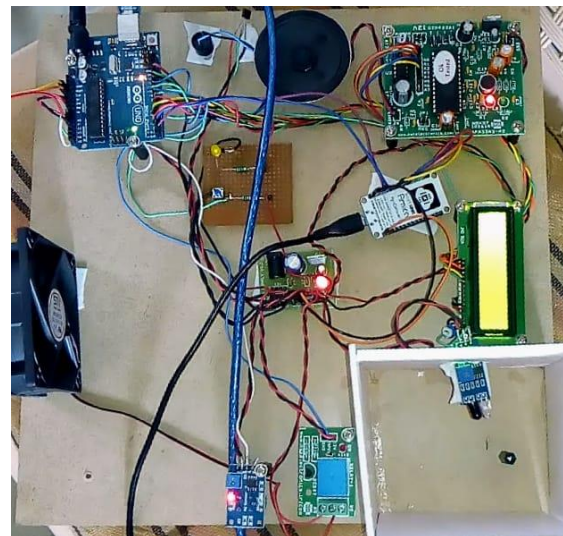

The first part is elder person with visual impaired: In this case we guide the elder person for their daily activity through the voice message or alert

And the second part is for the elder person who is good at their visual impairments: we can guide them easily through the message to telegram or through the LCD

But in some situations, we need to alert the elder person through voice alert message to be given in the both kind of elder persons.

Then here we are sending the updates message of the elder person to their caretaker through the telegram app. Even we share the location of the elder person through this telegram itself so in any emergency it gives a trace of the elder person to the caretaker.

Some of the results snapshots are as follows
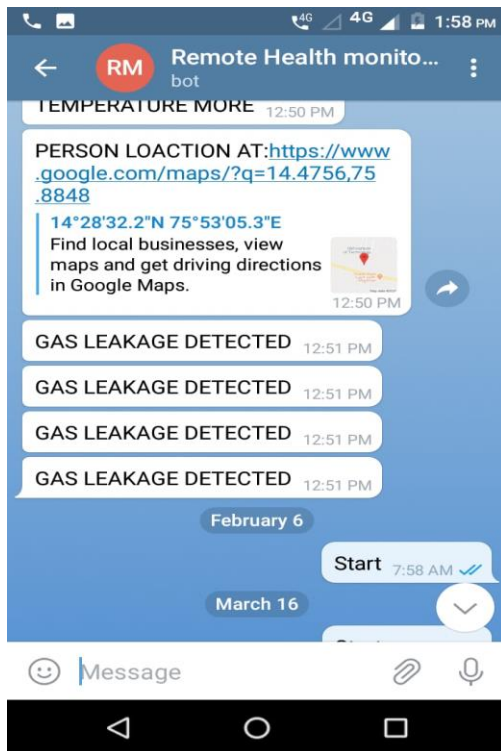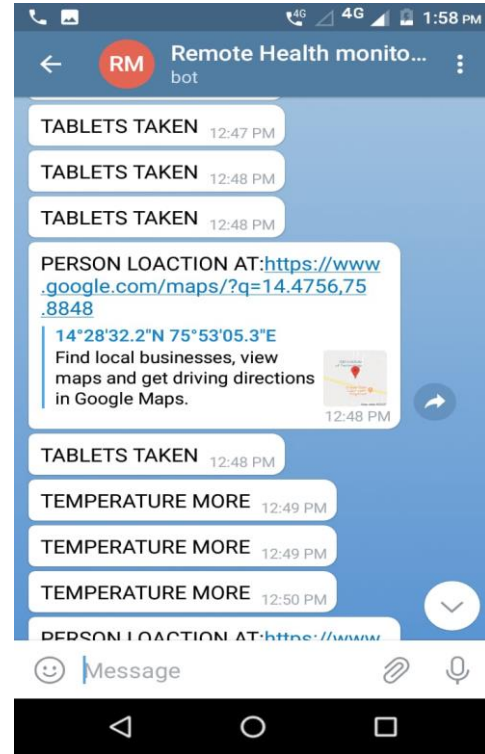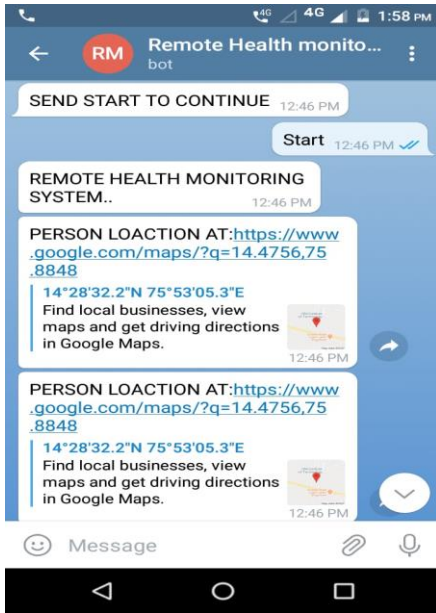
CONCLUSION

To give strength for keep an eye on the everyday activities for elder person, automated application is suitable and appropriate devices due to its high functionality. In this we have used the automated mobile application, automated home, and coping services will decreases the requirements on elder people attentively and effort while computing everyday activities. It gives alerts for emergency and overall activities for elder people. Activities and alerts for any emergency conditions are created for caretaker and relatives. It reduces the health expenses and burden of health practitioners. Ours applications is good integrated with automated home atmosphere and hospital environment.

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