

Smart Watch with Vital Record and Monitoring System

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Abstract:

Fitness is a metric that assesses a person's overall health. People are pursuing healthy lives in many ways, such as decent eating, frequent exercise, and adequate sleep, as more people emerge from poverty. With the rise of the Internet of Things and smart phones, fitness is becoming increasingly popular through smart wearable devices. Electronics are increasingly being employed in clothes nowadays, making it smart and fashionable at the same time. The main goal of this project is to create a smart wearable watch for health monitoring system that will aid athletes and regular individuals who need to keep track of their health when exercising, yoga, meditation, jogging or working. This project will assist them in keeping track of their health and increasing the effectiveness of their everyday workouts. As a result, the idea offers a system that may provide information on our various health parameters, such as the temperature, oxygen, heart rate, motion of your body etc and will also keep its record and also send message to third person in case of abnormality in any of health parameters.

Keywords — Smart wearables, health monitoring, IOT, Overall health, healthy lifestyle.

I. INTRODUCTION

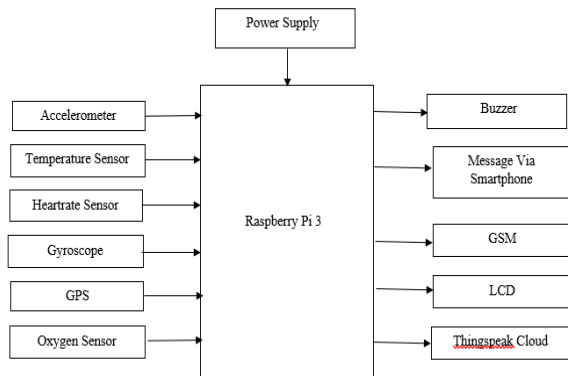
In today's world, diseases are increasingly prevalent and can have a significant impact on our well-being. However, with regular examination, many of these diseases can be managed and even prevented. To achieve this, it is crucial to have access to moderate, unobstructive, and user-friendly medical services that enable continuous monitoring of our health and meet the growing medical care needs. This is why we have embarked on a project to design a smart wearable health monitoring watch. Our goal is to provide athletes, regular individuals, and those who engage in physical activities such as

yoga, running, and working, with a system that will allow them to monitor their health and enhance their daily lives. With this system, users can track their various health parameters and receive real-time updates on any abnormality detected, making it an essential tool for improving overall health and well-being.

II. METHODOLOGY

This project contains raspberry pi 3 as the main controller. System monitors the health parameters. Temperature sensor senses the body temperature, heart beat sensor reads the heart rate of the person,

oxygen sensor will sense the oxygen of person. Accelerometer will measure the movements of body like steps, etc. GPS will monitor the location of person. Gyroscope will measure angular velocity which is used to detect motion, track them accurately when you are on the go. This data will be shown on LCD screen and also be transferred to the thingspeak (cloud) from raspberry pi, and will be stored there. It will also show real time graph of these health parameters. In case of any abnormality with any of these parameters the buzzer will buzz. GSM module is used which will send the message regarding the alert to person's mobile and also the third person's mobile.



A. Raspberry Pi

In our project, the Raspberry Pi serves as the main controller to which all the sensors are connected. It can collect data from the sensors and process it in real-time. The Raspberry Pi can also be used to store the collected data in a database or send it to a cloud server which is thingspeak in our project for further analysis. In addition, the Raspberry Pi can be used to display the collected data on an LCD screen or send alerts to the user if any abnormality is detected.

B. Sensors

1) **Oxygen Sensor:** This sensor measures the amount of oxygen present in the air, which can help to determine the level of oxygen saturation in a person's blood. This is an important parameter for individuals who engage in physical activities like

exercising or running, as it can indicate the level of aerobic endurance.

2) **Temperature Sensor:** This sensor measures the ambient temperature, which can be useful in detecting any changes in body temperature. This can help to detect fever or hypothermia, which can be indicative of underlying health issues.

3) **Accelerometer Sensor:** This sensor measures acceleration forces acting on the device, such as changes in speed or direction. It can be used to track the motion of a person's body during exercise or other physical activities.

4) **Heart Rate Sensor:** This sensor measures the heart rate of an individual, which is an important parameter in determining their cardiovascular health. It can also indicate the intensity of physical activity and help to track the effectiveness of exercise routines.

5) **Gyroscope Sensor:** This sensor measures the orientation and rotational movement of the device. It can be used to track the movement of a person's body during physical activities such as yoga or meditation.

6) **GPS Sensor:** This sensor uses satellite technology to determine the location of the device. It can be useful in tracking the route taken during outdoor physical activities like running or hiking.

7) **Buzzer Sensor:** This sensor is a simple audio device that can be used to provide an audible alert or notification to the user. It can be used to signal an abnormality in any of the measured health parameters or to provide a reminder for physical activity.

8) **GSM:** This is global system for mobile which is used send message to person's mobile phone regarding any abnormality of any of the health parameters.

C. ThingSpeak

It is this cool platform that lets you collect and analyze data from all sorts of sensors and IoT devices. And with your smart wearable health monitoring watch project, you can totally use

ThingSpeak to store and analyze the data from all those sensors connected to your Raspberry Pi. ThingSpeak has this super easy-to-use interface that lets you create channels, add fields, and view the data in real-time. Plus, you can even set up alerts and notifications based on specific conditions or thresholds, like when the sensors detect something weird.

II. RESULTS AND DISCUSSIONS

Fig 1 is the real time graph obtained on thingspeak cloud of various health parameters. This cloud will keep record of these parameters which will be helpful for future analysis of health of a user. This data can be accessed by third person (Guardian) or doctor to find record of various health parameters of the user.

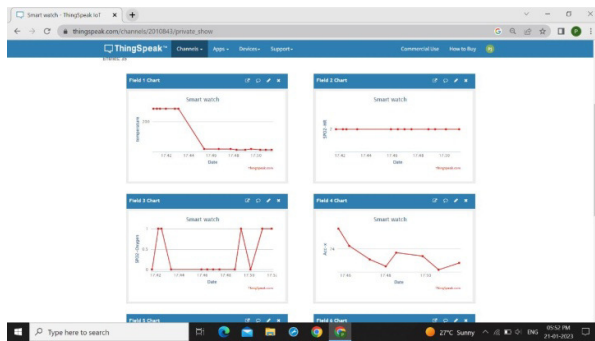


Fig. 1 Real time graph of oxygen, heart rate, accelerometer and temperature rate of an user

Fig 2 is a screenshot of messages received on mobile device of third person which could be a guardian of user or a doctor, in case of any abnormality in any of the health parameters of user. This is done with the help of GSM system.

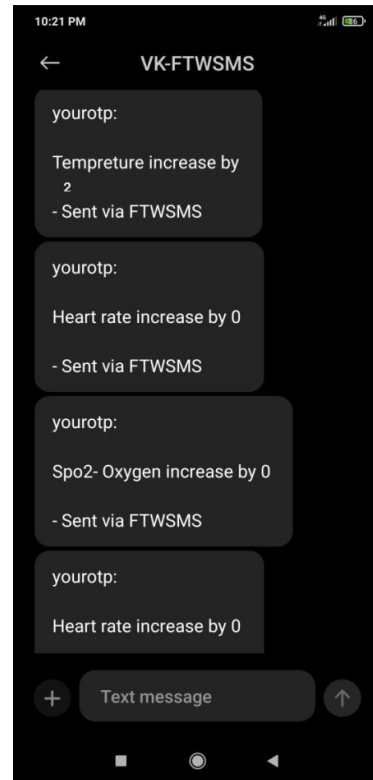


Fig. 2 Messages obtained on mobile device of third person when there is any abnormality in any of the health parameters of user

III. CONCLUSIONS

Our smart wearable health monitoring watch project has successfully created a user-friendly, portable solution for health monitoring that can track important health parameters and enhance daily lives. By utilizing Raspberry Pi as the main controller and connecting various sensors, we were able to collect and analyze data in real-time, and by integrating ThingSpeak, we were able to store and visualize this data for further analysis.

In addition, the project includes the ability to send messages to third parties in case of abnormality in any of the health parameters using the GSM system. This feature adds an extra layer of safety and security, allowing users to receive immediate assistance if needed. This project has significant implications for the healthcare industry and can

benefit anyone who wants to monitor their health during physical activities. We hope that our project will inspire further innovation in the field of health technology and positively impact people's lives.

ACKNOWLEDGMENT

We express our sincere gratitude towards the faculty members who makes this project a successful. We would like to express our thanks to our guide Mrs. Shailaja Yadav for her whole hearted co-operation and valuable suggestions, technical guidance throughout the project work. Special thanks to our H.O.D. Dr. Rutuja Deshmukh for her kind official support and encouragement. We are also deeply thankful to our project coordinators Mrs. Shailaja Yadav for their valuable guidance. Finally, we would LIKE TO THANK ALL STAFF MEMBER and faculty members of E & TC Department who helped us directly or indirectly to complete this work successfully.

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