

HEART RATE MONITORING AND HEART ATTACK DETECTION USING WEARABLE DEVICE

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Abstract— Life is precious. Many people among us lose their life to heart attack. This is because of their diet, age, less physical activity and many other factors. Today, the leading cause of death in the world is heart attack. Heart attack is not easy to detect and symptoms of heart attack varies from male to female. To overcome and help our society from heart diseases and attack, we are developing such a system which will help to decrease the death rate and early detection a heart attack.

I. INTRODUCTION

We are developing a system which will help to decrease the death rate due to heart attack by early detection of heart attack. In our system we will be using smart bands/ health bands which are easily available in market. These smart bands will continuously monitor heart rate of a user. When the heart rate of a user goes below a danger value, the near smart phone will get notified and the application installed in the smartphone will notify to concerned people of the user and will also notify to ambulance service. The smart band and the application will be connected by Bluetooth.

II. LITERATURE SURVEY

- 1) India will soon bear the largest burden of heart disease globally [1].
- 2) Heart attacks are five to six times more common during the hours of one to five A.M [2].
- 3) The leading cause of death worldwide is heart disease [3].
- 4) Every 20 seconds a heart attack occurs and a heart attack fatality occurs about every minute [4].
- 5) Congestive heart failure is a major chronic disease for older adults, accounting for about 260,000 deaths a year [5].

III. PROPOSED SYSTEM

The system will contain three main units. The wearable device will worn by the user. This device will monitor the user heart beat and will keep a record of the user. The second unit will be a android mobile, this unit will be connected to the

wearable device by Bluetooth. The third unit is about broadcasting the alert message by SMS from android mobile. The signal Propagation through various units as shown in Fig 1.



Fig. 1 Functional Block Diagram

IV. METHODS

The suggested systems will consist of three different modules as follows, flow diagram of various units as shown in Fig 2.

A. Wearable devices

Every user will be wearing a device. As today smart bands are common in the market and are easily available. The band will be monitoring the heartbeat of the user and will be processing it. If the heartbeat of the user is in critical condition then the band notify to the android smartphone. Fig 3 shows a smart band.

The heart rate monitoring sensor is built in the device. The device uses PPG method to detect the heartbeat. The device emits green light because the blood absorbs green light, so to determine the heartbeat the device flashes green light hundreds of times in one second. Because blood absorbs green light, and each pulse brings a spike in blood flow, determining heart rate is a matter of measuring the changes in green light absorption.



Fig 2 Flow diagram



Fig 3 Smart Band

B. Android smartphone

The smart band will be connected to the android phone by Bluetooth. The band will be transmitting the data to the smartphone by the help of Bluetooth. In the android smartphone user has to install android application which will be collecting the data from the smart band.

This application will monitoring the user activity and will keep a record of it. When the user's heartbeat will be under critical level. It will notify to the emergency contacts. The user has to enter the details of contact, in case of emergency. The application will also notify to the ambulance service. The smart band will be monitoring the heartbeat of the user and changes the critical level according to it or it can be manually entered by the user. As critical level varies from person to person. Fig 4 shows the screenshot of the application.



Fig 4 Screenshot of application

C. Notifying the emergency contact

The user has to enter details of the contacts, whom the application will alert in case of emergency. It is also recommended to add details of ambulance and doctor's in case of emergency. The application will use SMS to alert the emergency contacts. Whenever the user heart rate is in critical level the android application will notify to all emergency contacts.

V. CONCLUSION

In this way we are developing the system which able to detect any heart anomalies and heart attack by tracking heartbeat of a user. In coming future as the technology gets advance more feature will be added to the smart bands. This proposed system will help old age people to track their heart rate and in case of any heart anomalies it will notify to emergency contact. It can also be used by the users who have just under gone to heart surgery.

REFERENCES

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