

# Data Security Using Heart Monitoring System

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**Abstract-** There has been exponential growth within the use of wearable technologies in the last decade with smart wearable device having a large share of the market. Smart watches or smart wrist bands were mainly used for health and fitness purposes but recent years have seen a rise in their deployment in other areas. Recent smart devices are fitted with sensors with enhanced functionality and capabilities. This paper represents system which includes AVA application and smart wrist band. This technique is used to delete data after user's death or at any dangerous situation user can manually delete data by single click on wrist band. Also contain feature where in single click on wearable device location of user and help message can be shared to emergency contacts without using smart phone.

**Index terms-** Data Security, User Death, sensor, Android, GPS, URL

## I. INTRODUCTION

Nowadays mobiles become essential part of life. People used mobiles not only for calls but also for storage purpose, clicking pictures, recording audio-video, surfing on internet, accessing social media etc. Also, people store their important data on mobile. Hence, providing security to this mobile data is significant. Today there are various security methods are available for mobiles so anonymous people cannot access it. So, we know our data is safe but what happens to mobile data after the users dies. There is no any method to protect data or things which will assure you that your data is not going to handle by any human being. So that's why we came up with this concept.

Here, we introduce our system which include AVA application with wrist band. This system provides data security. People into world which store confidential data into their mobile. for example, writer store his/her new stories, musicians can store new songs, scientists can store their new findings, even people can also store daily diary writings. What

if after they died their data get leak to anonymous user and use their data under his/her name. So, if user wants to delete data after user death then that can happen by our system. Also, sometime user's mobile phone is stolen then user can delete data without mobile phone before it gets used by thieves.

Safety of women is one of the biggest issues in India. Crime rate against in our country are rapidly increasing. This is sad reality of our country where people are devotees of female goddess. So, we need to take measures to ensure women security. Not only women but even when any human being in danger situation like when someone get heart stroke, meet with an accident then they also want to send help message to contacts. Whether you are in any trouble or got separated from friends during night and do not know how to get home, having these apps on your phone can diminish your risk and bring assistance when you require it.

Following are key features of our system that makes it different from other systems:

1. User needs to save files, contact details and set password as he/she open app first. Then after user death or pressing button from wrist band data get delete.
2. At emergency situation user don't need mobile device to send help message. By clicking press button from wrist button user can send help message to emergency contact.

## II. LITERATURE REVIEW

There are various apps which will provide data security for mobile application. We studied few research papers as per follows:

1) LOCKME is an android security application. In these When device is protected using this application owner of device decides which content of device will be user see and access it. This application makes

changes in OS through application this will help the easy to protect the device from unauthorized user.[9]

2) SECURITY LOCK -anti theft is an integration of app locker and detection of theft using user pattern. If the mobile is get mugged, there's only a two choices, first is to alter the SIM card and second is to hold identical SIM card and check out to use the apps. If SIM card is modified then naturally GPS, Voice recorder & Camera are initiated, so Location and Audio uplink are sent as SMS to the backup number of the user, and photograph is mailed. If he tries to use the private apps then system can question the user with five random queries.[13]

3) APPLOCK is an application to provide security for mobile device. Use of this app is pretty simple. AppLock protects individual apps from anonymous users by asking a user to put a security pin to access the app. You can put a security lock on your SMS, Contacts, Gmail or for that matter, any app. This all application is used to security to mobile phones but don't have any options to deal with mobile data after users' death.[4]

4) FIND MY DEVICE is an improved Android Device Manager allows you to ring, find, lock your Android device remotely. It also allows you to wipe the device's entire data if it by any chance it gets permanently out of your reach.[1]

But this application doesn't delete data after user's death and don't have feature of sending help messages and location at emergency or dangerous situation.

5) FIGHTBACK: - This app is developed by Mahindra faction. After Delhi gang rape incident, this app is on hand at no cost. But In earlier days, this app was not complimentary, customer have to compensate for this app. This app sends a message to your friend or contacts that "user is in trouble" through E-mail, SMS and GPRS. This app works on those mobiles that support Android Java Programming.[2]

6) ABHAYA is an women safety android application which is used to send help message and location in any dangerous situation. The unique feature of this application is to send message to the registered contacts continuously for every five minutes until the "stop" button in the application is clicked.[12]

7) SECUREME BETA: - This app is developed by Think MPI Consulting Private Limited. It helps us to raise alert and we can get help in case of dangerous

situation or emergencies. By pressing a tap on secure button, it notifies the contacts with location coordinates.[3]

8) RAKSHA – WOMEN SAFETY ALERT: - This app is launched by BJP on May 15, 2014. In case of life-threatening emergencies, we have to click button, then it sends location of the user to the contacts registered and the user can also get the details of the location of the contacts. A distress signal just by pressing a single key sends out a loud buzzer to our near and family. We can add multiple contacts to this app and when there is no data connection, this app alerts the contacts by sending SMS.[5]

But this application needs mobile device to send help messages unlike our system where we don't need to find mobile for send help message. by clicking press button on wrist band we can send help message to emergency contacts.

### III. PROPOSED SYSTEM

To develop system for android users to delete data automatic after user's death and manually this application has following architecture model.

System Architecture:

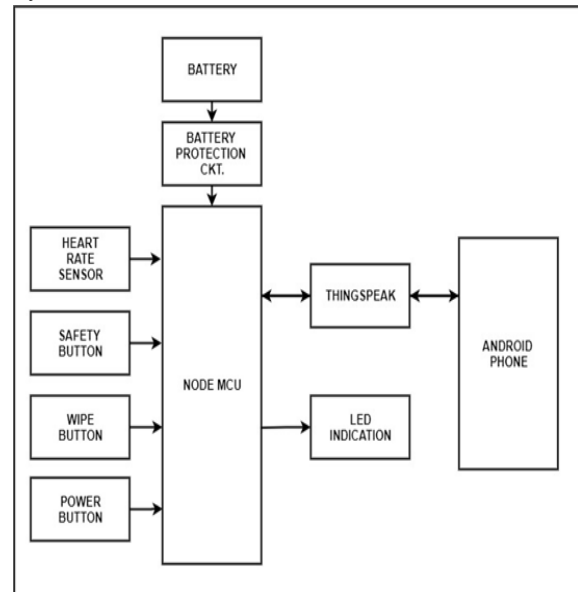


Figure 1 System Architecture

#### 1. NodeMCU:

We used NodeMCU is an open source IoT platform. It includes firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module.

## 2. Pulse rate sensor:

Pulse rate Sensor is a well-designed plug-and-play heart-rate sensor for Arduino. The sensor clips onto a fingertip or earlobe and plugs right into Arduino. It also includes an open-source monitoring app that graphs your pulse in real time. Specification is as follows:

- Operating voltage: 3.3V – 5V
- Current: 4mA
- Indicator LED

“Fig 1” shows the block diagram of the system. We use NodeMCU as a microcontroller in our system. It uses a Heart Monitoring Sensor (Pulse Rate Sensor) for sensing user’s current state. If the user is alive no action would be performed. If the user is dead a command would be sent by the device to user’s mobile to delete all the data. It has three buttons. The first button is for manual wiping of phone’s data. The second button is used for safety function. The third button is used for Power ON/OFF. An android app is developed for this project. It has the ability to sense the pulse sensor data and do an automatic wipe when the person is dead. It also has a manual data wiping button. A safety button is also present inside the app for sending alert message to other members. The automatic wipe will occur only if the user is dead. Data would be stored on Thing Speak cloud server.

## IV. ALGORITHM

Input: btn1val, btn2val

Output: hrsval, hrsstat, battery, helpbutton, manualerasetbutton

Notation:

btn1val = Button 1 Value (help button)

btn2val = Button 2 Value (manual erase button)

hrsval = Heart Rate Sensor Value

hrsstat = Heart Rate Sensor Status

battery = Battery Status

helpbutton = Help Button Status

manualerasetbutton = Manual Erase Button Status

Algorithm:

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if (btn1val == HIGH) then set helpbutton == 0
    else set helpbutton == 1
if (btn2val == LOW) then set manualerasetbutton == 0
    else set manualerasetbutton == 1
if (600 < hrsval && hrsval < 625) then hrsstat == 0
    
```

```

else set hrsstat == 1
if (connected) set battery == 1
    else set battery == 0
    
```

## V. EVALUATION RESULTS & UNIQUENESS

The total evaluation can be done in four major steps which are described individually. Evaluation describes the whole working of the application in four major steps as follows:

The first major step is to switch on/off wrist band. After putting band on wrist user needs to press switch button. If user without pressing switch off button remove band then app consider that user is dead and user’s data get deleted. So, it is important to switch on/off button.

The second major step is to enter the contact details, help message and set password in the application created. User may include contact numbers of relatives, friends and chief cop of the particular city the person we live in. When the application is installed in the smart phone for the first time the above contact details should be put into application and set password. Also save the confidential information which user don’t want handle by anonymous user in application by its address in device. The application will save the given information.

The third major step is done by automatically. If user is dead or user press manual eraser button then pulse rate in application shows 0 and after 10 seconds the data protected in application get delete from device.

The fourth major step is to send the GPS information (GPS information in the form of the Co-ordinates or the URL) and help messages to the registered contacts at emergency times or when the person is needed to be rescued. This step is followed only when the rescue button is pressed on smart band.

The whole processes of this step are done only when the device is connected to the proper mobile network and location service in the device is switched on (GPS) and charged smart band.

### A. UNIQUENESS

This system contains options where user will decide which data needs to be more private so that it gets delete after user’s death before anyone one finds out what is it. It has feature where user can delete data manually also if he/she finds out that their data is any

in any vulnerable condition. It can send help message and location to emergency contacts without finding out mobile by clicking press button on wrist band.

**B. RESULTS**

The following figures are screenshots of application and circuit diagram of band.

Figure 2 represents circuit diagram of smart wrist band which essential for system. It contains node mcu, sensor, switch, press buttons, battery, LED indicator. Switch button is used to switch on/off wrist band. There are two press buttons. One is used to manually delete data and another one is used to send help message with location of user.

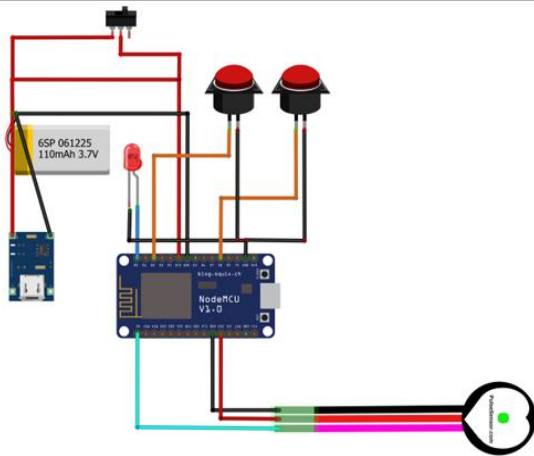


Figure 2 Circuit diagram of wrist band figure 3. represents screenshots of AVA application immediately after opening the app. It contains app full name and app icon.

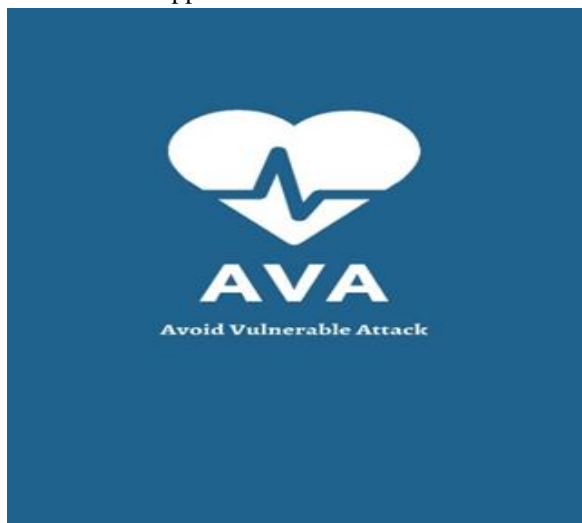


Figure 3 Screenshot after opening AVA app Figure 4. represents home page of AVA application which conations 4 types of status. Pulse rate status

display number 0 and 1to show user is dead or not respectively. Battery status shows wrist band is switch on or not. Help status show if we send help message or not. Manual erase shows if user press manual button or not. Home page contain two buttons. First is setting which contains help message and contact information open by password. Second button conation file which is going to be delete.

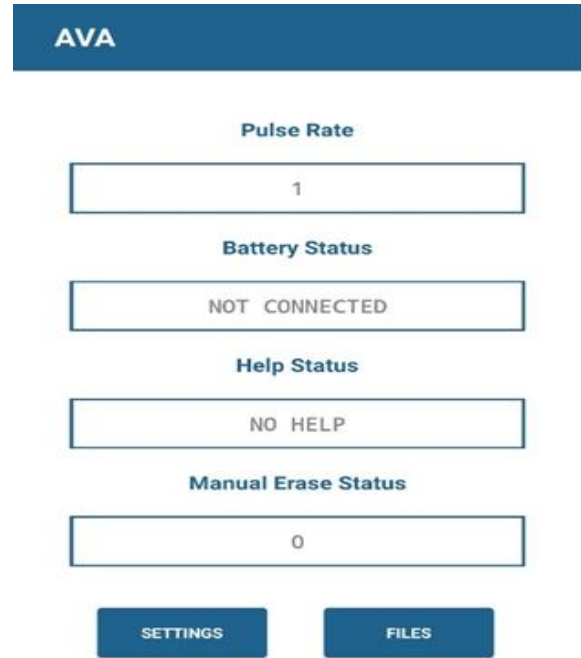


Figure 4 Home page of AVA app Figure 5. represents pin password page which is used to open setting and file pages.

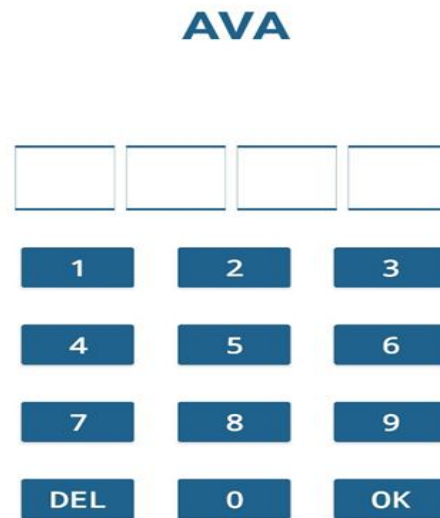


Figure 5. Password page of AVA app Figure 6. represents setting which include contact information and help message. Here user can put

contact details and help message. This page also includes password change process.

Figure 6 Setting page of AVA app.

Figure 7. represents file page where user can include file to protected and delete.

Figure 7 File page of AVA app

## VI. CONCLUSION

In this paper, we have described AVA - An android application with smart wearable device having two basic features. Primary feature is deletion of mobile data after user's death or user can manually delete data using smart wearable device. secondary feature is to send help message and location of user's in emergency condition. The merit of this system is it can send help message by using press button on wrist band so user doesn't need mobile to do this task.

## VII. FUTURE SCOPE

As a future scope, this application can be used to delete or clean all the mobile data after user's death. Also, it can used to clear user's drive account. It can be used to inform user's death to all his social networking server so user's account will be deleted before being misused. Further it can be developed for IOS and windows platform.

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