Software Development Project II

CSE 3200

Project Name: EyeMate for Blind and Blind Tracker

Developed By

Sharmin Shobnom Desha Roll: 1107013

Md. Siddiqur Rahman Tanveer Roll: 1107048

Supervised by

Mr. Kowsar Hossain

Assistant Professor Dept. of CSE

KUET, Bangladesh

Acknowledgment

We feel pleased to have the opportunity to express our heartiest and most sincere gratitude to a number of people who have helped us in course of this project.

Our first and deepest gratitude is to the Almighty, then we wish to acknowledge our profound indebtedness to Mr. Kowsar Hossain, Assistant Professor, Department of Computer Science & Engineering, Khulna University of Engineering & Technology (KUET).His constant supervision, constructive criticism, valuable advice, scholarly guidance and encouragement at all stages of this project has given us courage to complete the project work.

We would also like to give our sincere thanks, the all-out cooperation and services rendered by faculty members, staffs and students of Department of Computer Science & Engineering. Finally to all who contributed in any way we desire to express our deep appreciations and sincere feelings.

Abstract

EyeMate for Blind and Blind Tracker is an Android, Arduino and Web based embedded system which main goal is to help blind person to walk easily in the street avoiding the obstacle in the road. In this embedded system it contains a hardware part that detects the obstacle and the send the position of the obstacle to the Bluetooth connected Android phone and the app speaks in Bengali language about the location of the obstacle. So the blind person can easily avoid the obstacle. Getting location using GPS service by the Android phone then it is sent to the server. Blind person can seek help using a voice command and a phone call is established and using the Blind Tracker app we can find the blind person easily.

Contents

List of Figures

CHAPTER 1

Introduction

1.1 Background:

It is basically an embedded system that will help the blind and hearing impaired person to walk in the street. In this embedded system the position of the obstacle will be informed to the blind person through speaking using the Android speech service. So that the blind person can decide where the obstacle is and can skip that path. While walking the GPS device in Android phone will get the current location and save it in the Remote database server so that we can easily track the blind person .As a result we can find any blind person easily if he is lost. Blind person call to an emergency number via voice command.

1.2 Objectives:

- ✓ Identify the location of the obstacle using sensors situated in head band and hand.
- ✓ Speaking the location of the obstacle in Bengali language to the blind person
- ✓ Sending the current location of the blind person to the server
- ✓ Blind person can seek emergency help just giving voice command to the application
- ✓ Blind person can give voice command just pressing headset button
- ✓ Tracking the current location of the blind person
- ✓ Finding the location in Google Map

1.3 Platform:

We use these platforms for developing our project

1. Android operating system for smart phone.

2. We also used PHP server system as it's easy to host.

3. MySQL database data are represented as JSON format.

4. Arduino Mega for hardware interfacing.

CHAPTER 2

System Module

Since our system is an embedded system so it contains two important modules that's are given below

1. Hardware module

2. Software Module

2.1.1 Hardware module: The hardware module includes

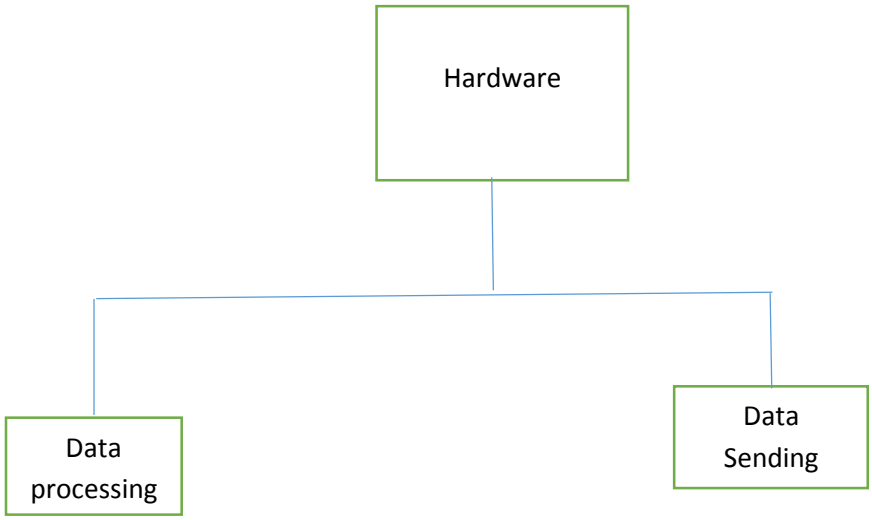

Fig1: Hardware Module

2.1.2 Software module: Software will include these criteria……

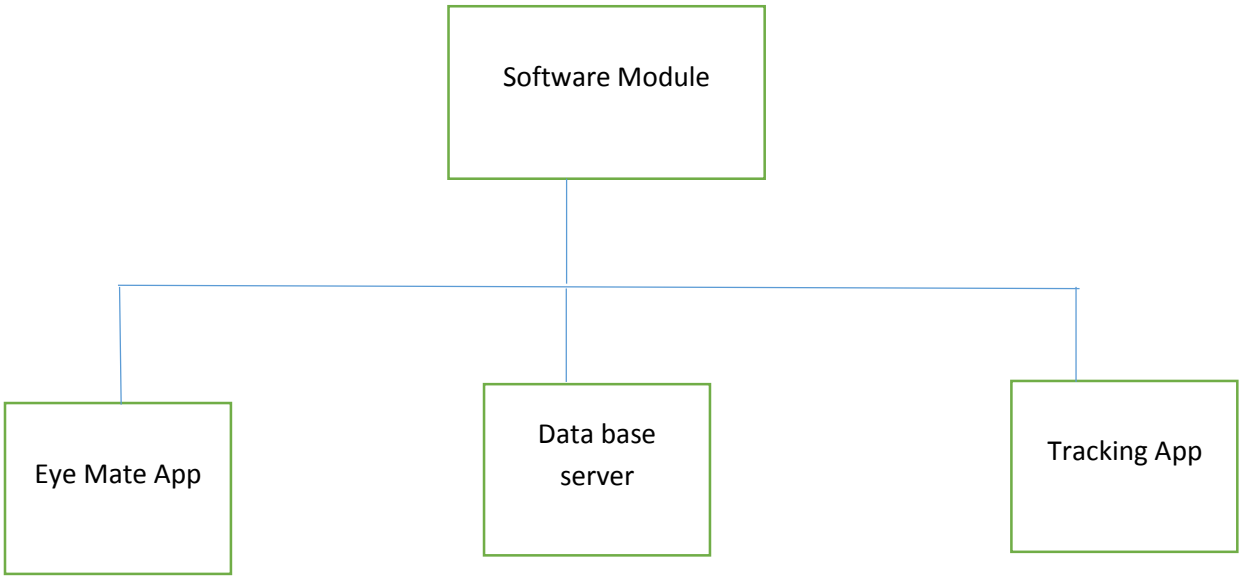

Fig 2: Software Module

2.2 Developing Tools:

We use the following developing tools for implementing our project

1. Android Developer Tools v21.0.1-543035
2. Android Developer Tools v23.0.2.1259578
3. arduino-1.0.5-r2-windows
4. xampp-win32-1.7.4-VC6
5. jdk-7u17-windows-i586

2.3 Project Block Diagram:

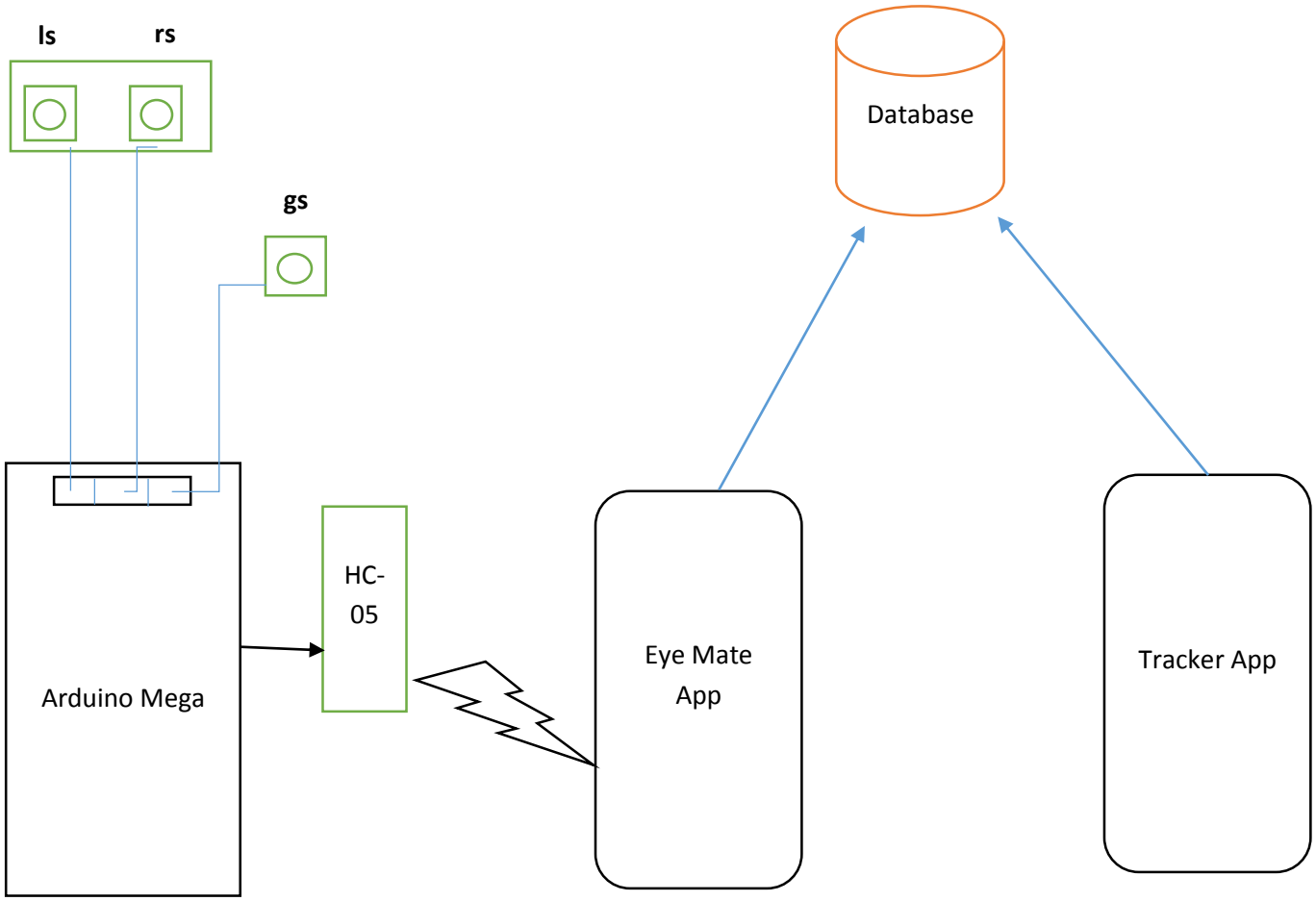

Fig 3: Diagram of the full system

Note: ls = left ultrasonic sensor, rs = right ultrasonic sensor, gs = ground ultrasonic sensor

CHAPTER 3

System Flow Chart

3.1 Hardware Module Running Flow Chart:

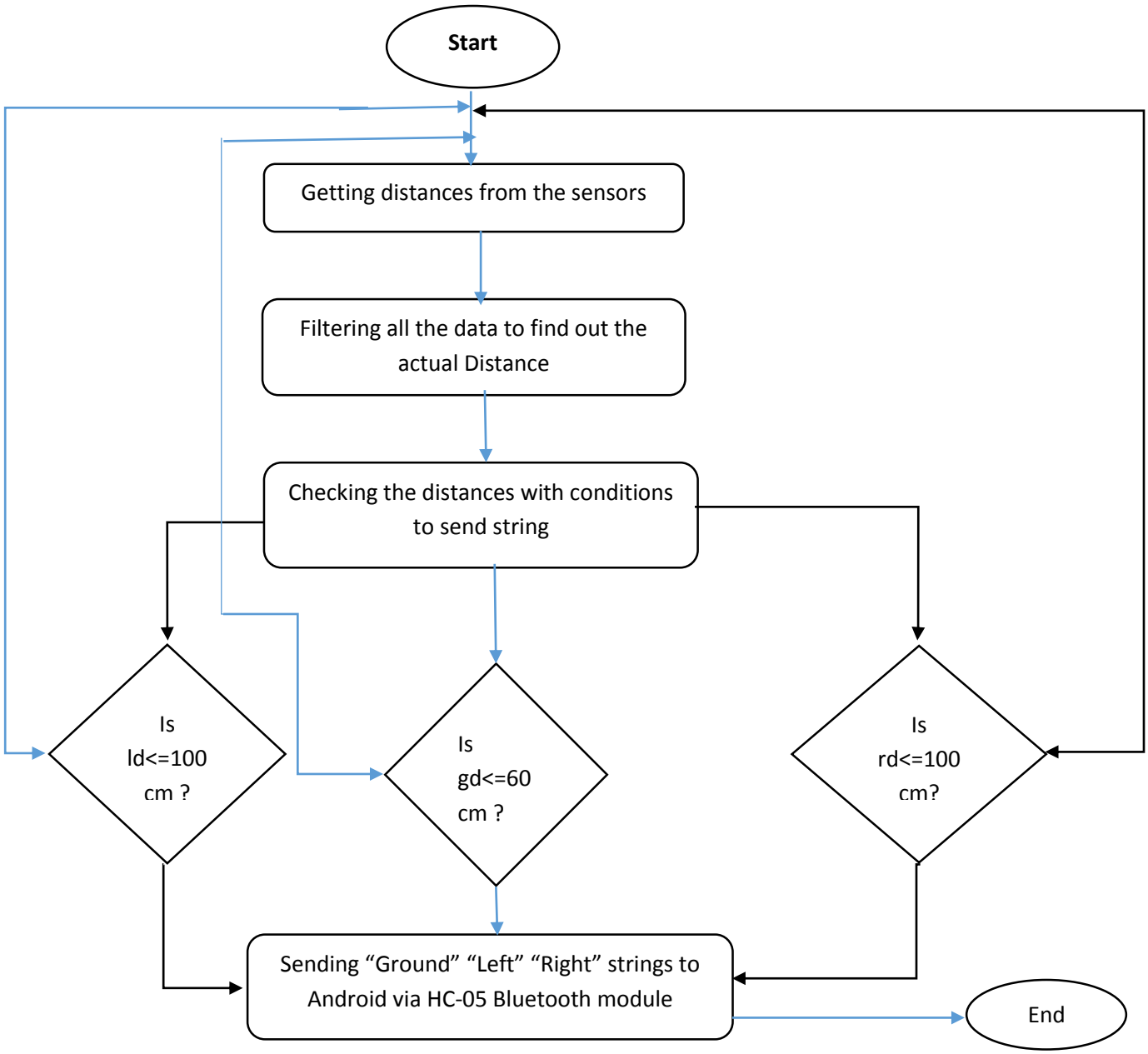

Fig 4: Hardware Module Running Flow Chart

3.2 Software Module Running Flow Chart:

3.2.1 EyeMate App Module:

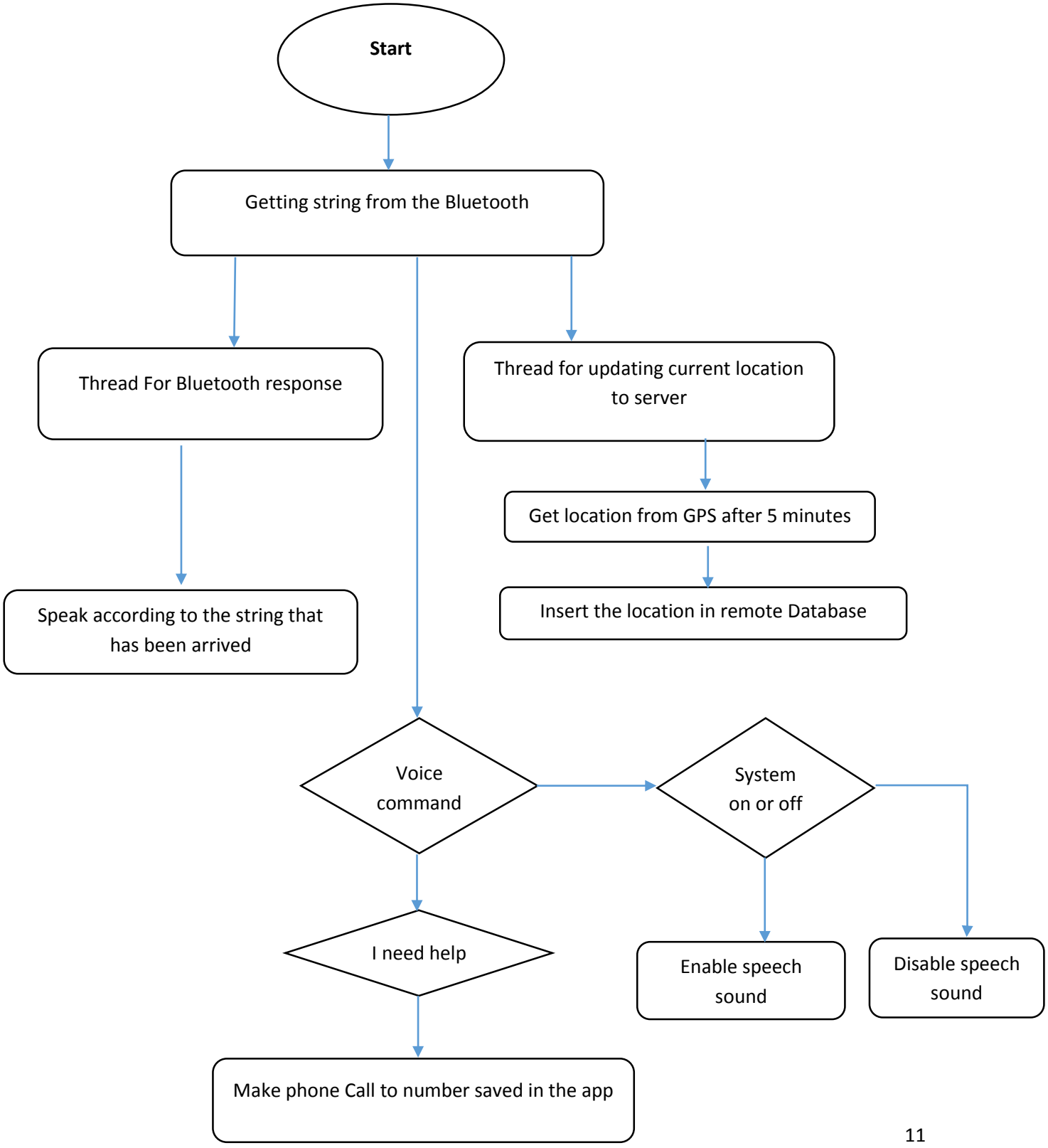

Fig 5: EyeMate app module

3.2.2Tracker App Module:

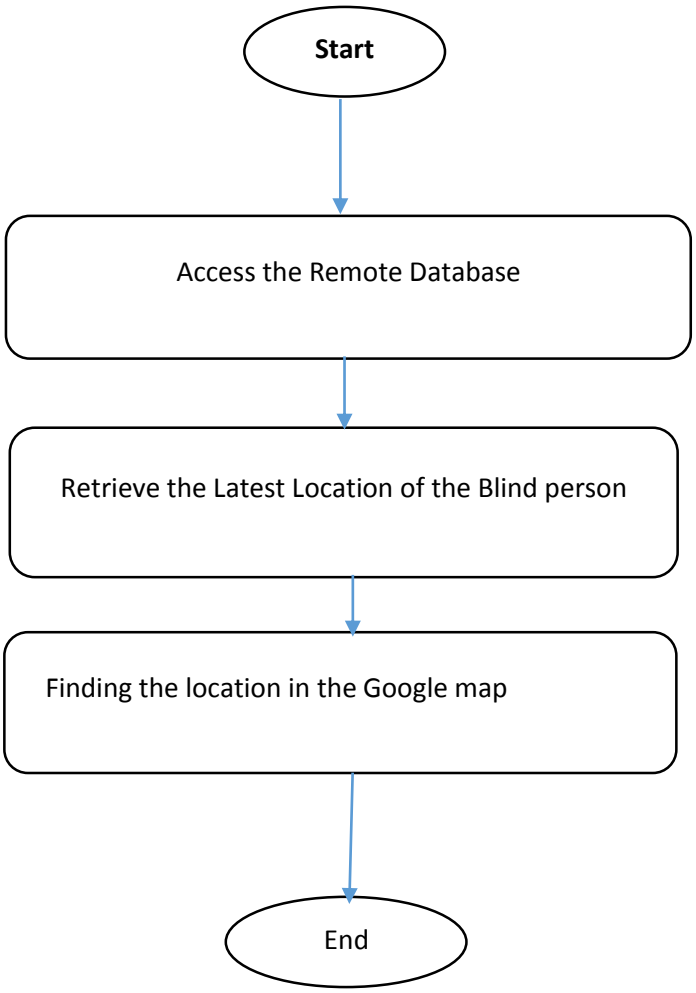

Fig 6: Blind Tracker app module

Chapter 4

Interfaces

4.1 Hardware Module: The hardware part of our system is shown below it contains three Maxbotix EZ0 range finders, HC-05 Bluetooth module, Arduino Mega2560.

Fig 7: Hardware part of the system

4.2 Eyemate Interface: Our Eyemate app has several user interfaces these are shown with figures below.

4.2.1 EYEMATE Activity: This activity is the main activity in the app here the Android application is connected with the hardware module. When any obstacle is detected by the sensors then Android phone speaks the location of the obstacle.

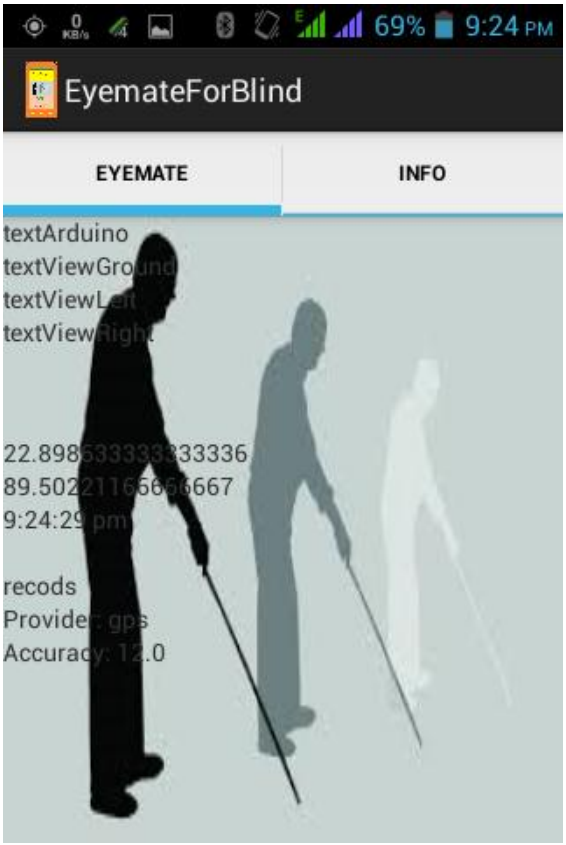

Fig 8: EYEMATE Activity

4.2.2 Sending Current Location to Server: When the blind is walking his location is obtained by the Android phone using the GPS service and the location is sent to our server.

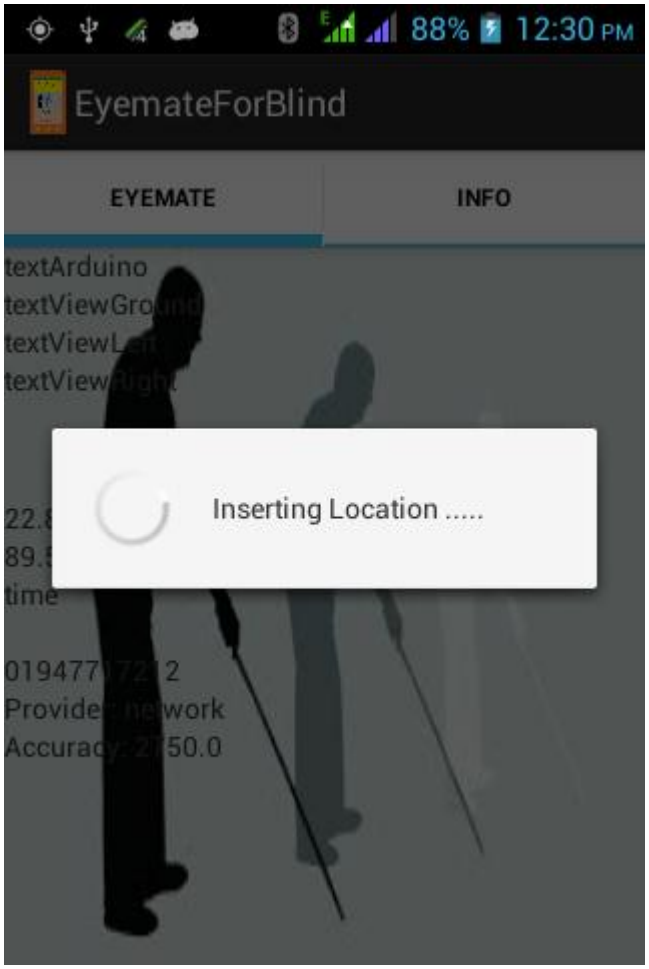

Fig 9: Sending current location to server

4.2.3 INFO Activity: We can save an emergency number in app so that the blind person can immediately want help by calling that number.

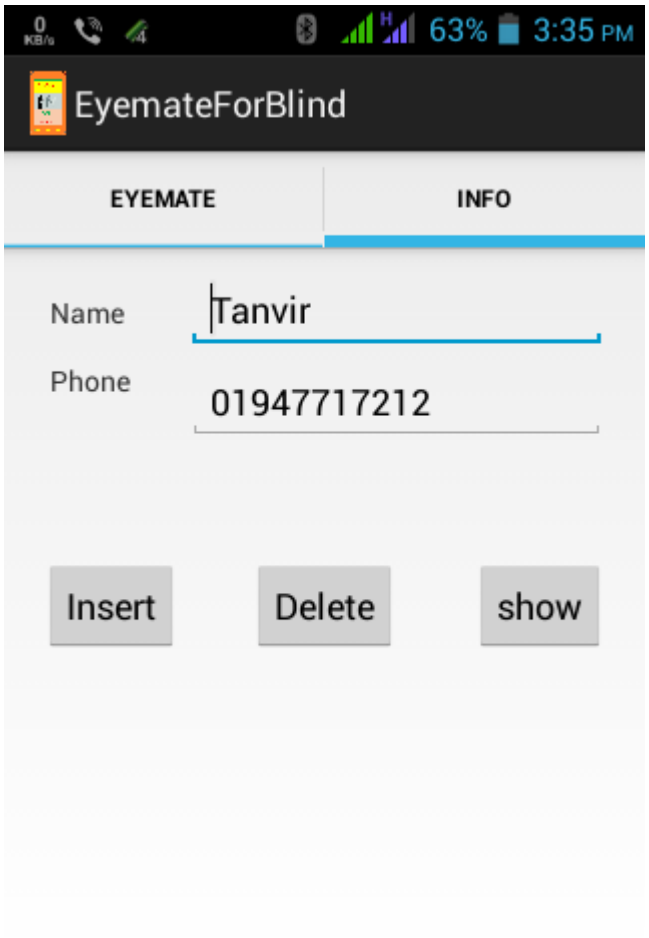

Fig 10: INFO Activity

4.2.4 Voice Command Activity: The blind person can perform necessary steps using voice command to the app.

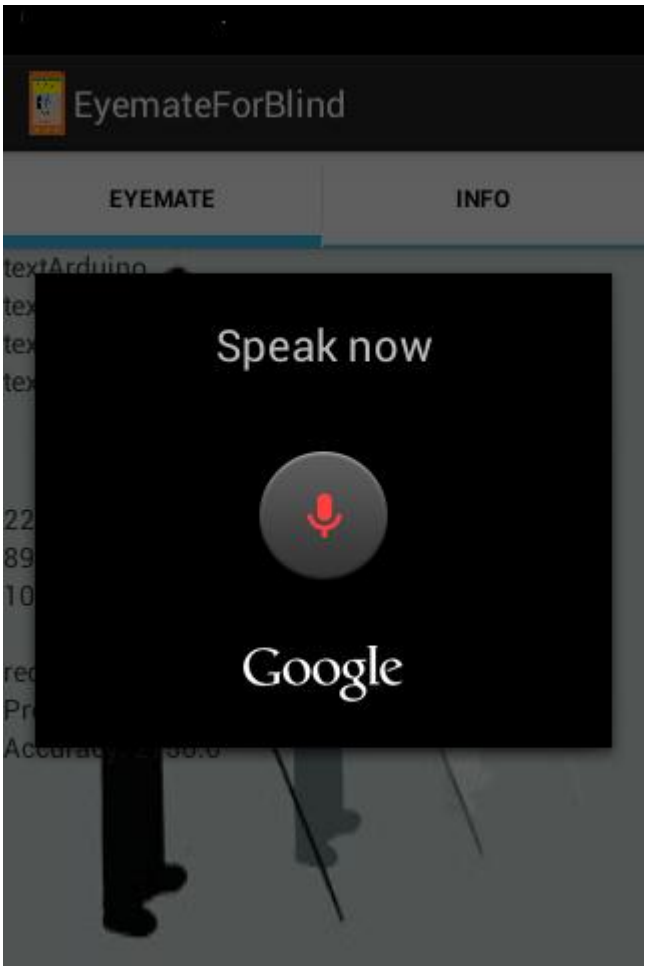

Fig 11: Voice Command Activity

4.2.5 Emergency Calling system: Blind person can call to the emergency helping number that we save in the app just using the voice command “I need help” and then phone call will be started.

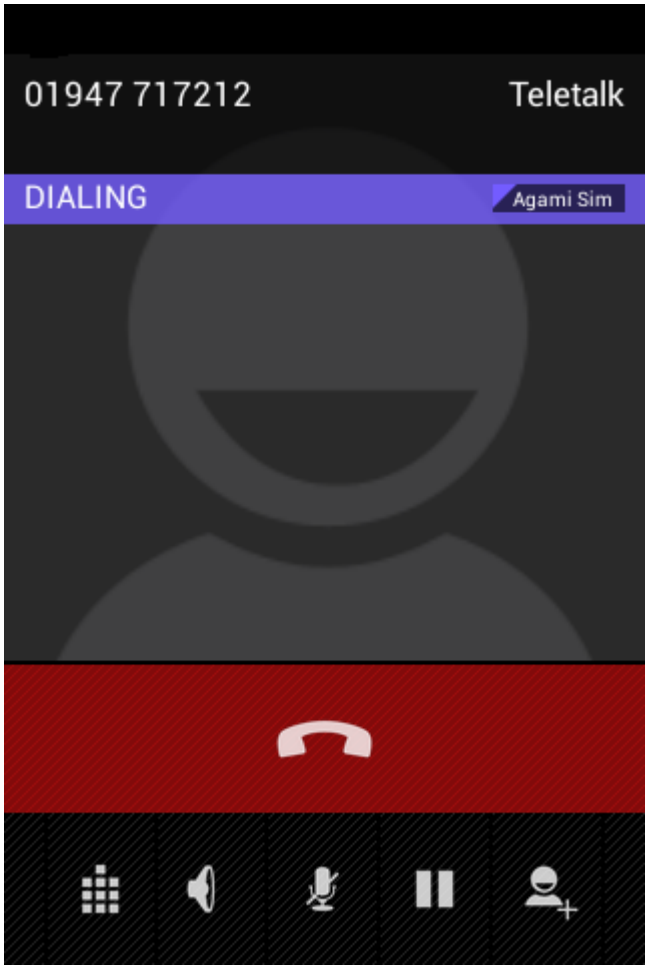

Fig 12: Emergency calling system

4.3 Blind Tracker Interface: After getting the call from the blind person we will go to help by using our Blind Tracker app. Its interfaces are shown below.

4.3.1 Getting Current Location of the Blind Person: We can get the current location of the blind person from our server.

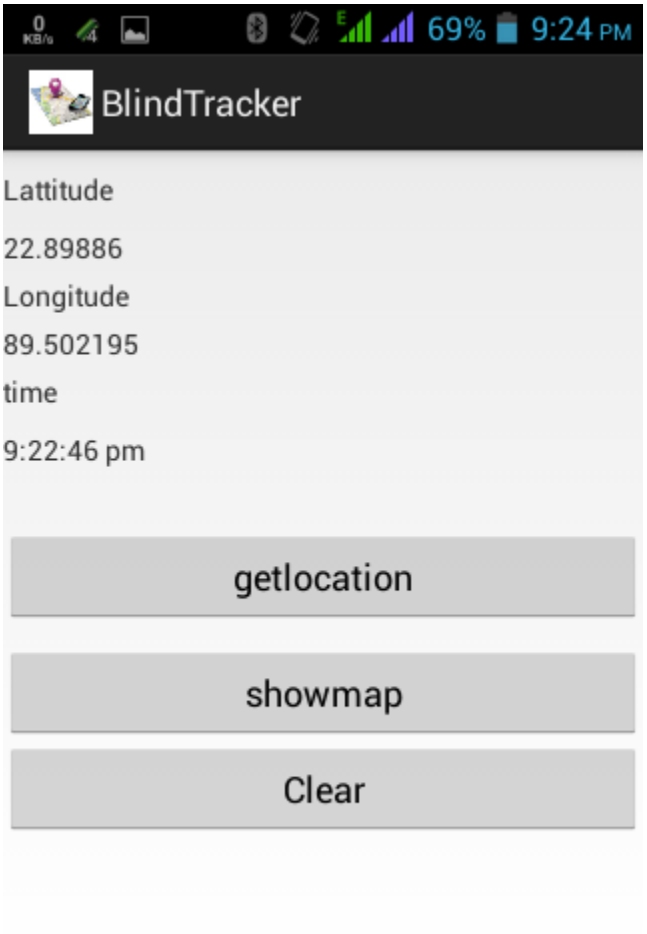

Fig 13: Getting current location of the blind person

4.3.2 Finding the location in Google Map : Now we can easily find the location in Google map very easily.

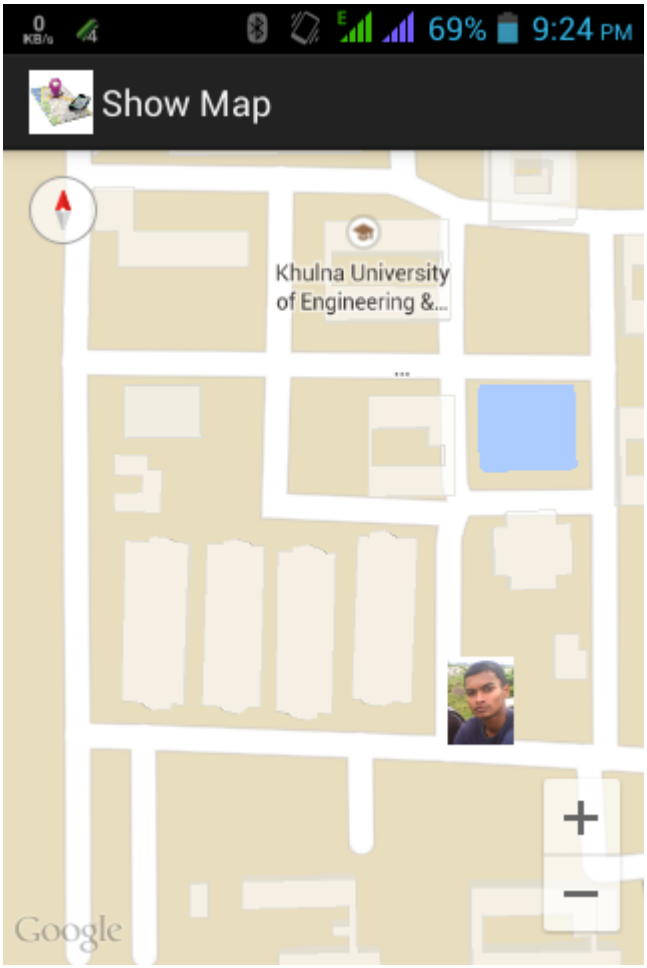

Fig 14: Finding the Location in Google Map

Chapter 5

Limitations and Future Plan

5.1 Limitations: We have the following limitations that we have to consider .These are

- ✓ Bluetooth connection often gets disconnected
- ✓ Google voice recognizer can't pick all the command
- ✓ Bluetooth communication may disrupted by noise
- ✓ Internet connection is required all the time
- ✓ UltraSonic range finder is interrupted by noise, humidity, temperature
- ✓ Position getting from Network provider is not always appropriate
- ✓ Our hardware part is bulky
- ✓ Blind Tracker app doesn't run under API 17
- ✓ Eyemate can't receive Bengali voice command since Bangla text to speech is not rich in Android
- ✓ Headset button doesn't work appropriately at all time

5.2 Future Plans:

- ✓ Minimize the size of the hardware components
- ✓ Develop it for all other languages user
- ✓ Develop the apps for cross platform
- ✓ Minimize the developing cost of the entire project
- ✓ Using the vibrator in hardware part so that user may use it without a phone in an exceptional condition

Chapter 6

References

1. http://developer.android.com/guide/index.html
2. https://developers.google.com/maps/documentation/android/
3. http://www.androidhive.info/category/json/
4. http://www.androidhive.info/category/gps/
5. http://www.arduino.cc/en/Tutorial/Ping/