Eye Mate For Visually Disabled and Hearing impaired

It will be 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.

Now lets take a look at the system Module:

1. Hardware module
2. Software Module

Hardware module: The hardware module includes these criteria…….

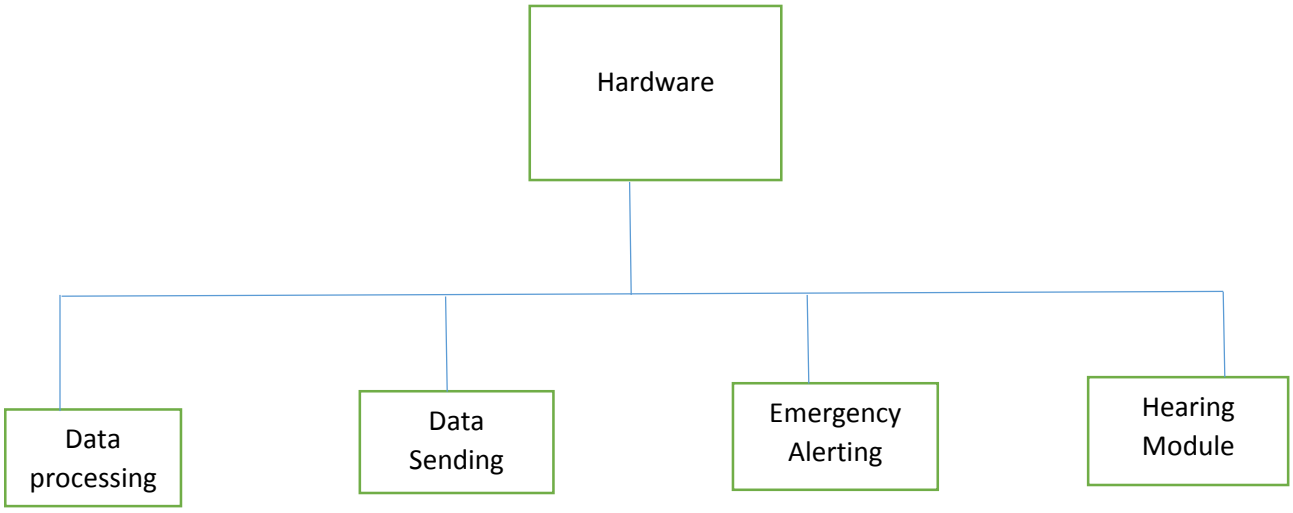


Fig: Hardware Module

Now lets come to the description section…….

Data Processing Module: Data processing module collects the distances of the obstacle using Maxbotix EZ0 ultrasonic range finder and process the data to get the accurate distance since the range finder uses a sound in ultrasonic frequency it may be disrupted by noise, humidity ,high temperature etc. So we need to filter the data and use the filtering programme to get the actual distance. And hence for this we use Arduino Mega development board which contains Atmega 2560 Microcontroller that will process our data.

Data Sending Module: Since we want to include the smart phone to be embedded with the hardware module so the data transferring protocol between them is Bluetooth . So we will use HC-05 Bluetooth module which is used to send the string to tha Android phone so that the application running in Android can generate the appropriate speech which will pave the path to the blind.

Emergency Alerting Module: This module is the special purpose module which will be only used in the case of system failure that I mean that if the connection between Android and HC-05 is lost.Then by pressing the emergency push button the vibratoar will be active and ‘ll vibrate according to the data recorded by the sensor.

Hearing Module: This module is specially for the hearing impaired person. We will use an amplifier circuit that will amplify the speech sound generated by the android phone so that the hearing impaired person can appropriately hear the sound.

Software module: Software will include these criteria……

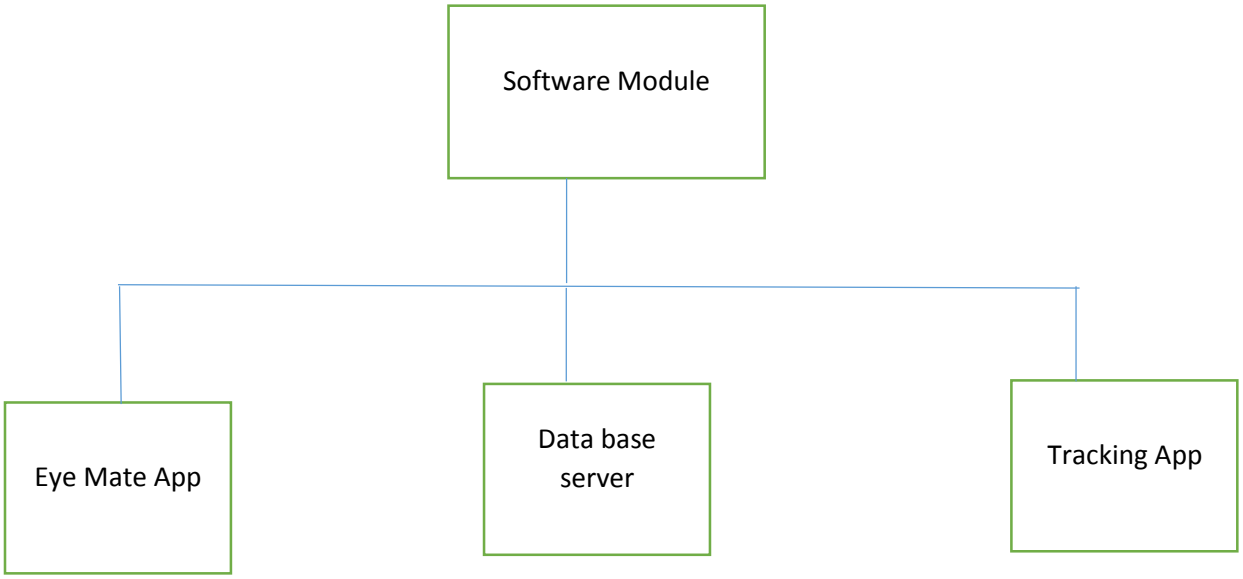


Fig: Software Module

Now lets come to the description section…

Eye Mate App: This is an android application that will be used to communicate with the hardware section and raise appropriate speech response. When the sensor tied in the finger to detect obstacle in the ground detects any distance that is less then 60 cm then the arduino board 'll send a string "Ground" and getting this string the application will speak "obstacle in the ground " so that the blind person can leave that way turn a side. The same thing will happen for the sensors set up in head band if the left sensor detect the obstacle that's distance is less than 100 cm then 'll send string "Left" and for right sensor it will be "Right" and as soon as getting the string the app will speak "Obstacle in the upper left" and "obstacle in the upper right". As a result the blind person can realize the view of the path and can deny that path.And can choose another way. While a Bluetooth handler thread is going through this response another thread Asynctask will insert the current location to the remote Database server by using the gps device used in the android phone .. In this purpose we will use Network provider

for getting the lattitude and longitude of the place where the blind person is walking since GPS provider doesn't work in the room.Also this location will be saved in the internal SQLite database so that if the blind person is lost then any one who will find the blind person can access the database and easily find out the initial location from where the blind person comes here.And using the voice command the blind person can seek immediate help request to the number that will be saved in the app and a message or phone call will be sent.

Database Server: This remote database server will store all the location traversed by the blind person so that any one can track the blind person easily.

Tracking App: This application will help us to find out the current location of the blind person.

If we access the database then the current location of the blind person will be marked in the Google map . So that if the blind person is lost and we can't reach him by phone call then we can easily go to that location pointed in the Google map.

Project design Block:

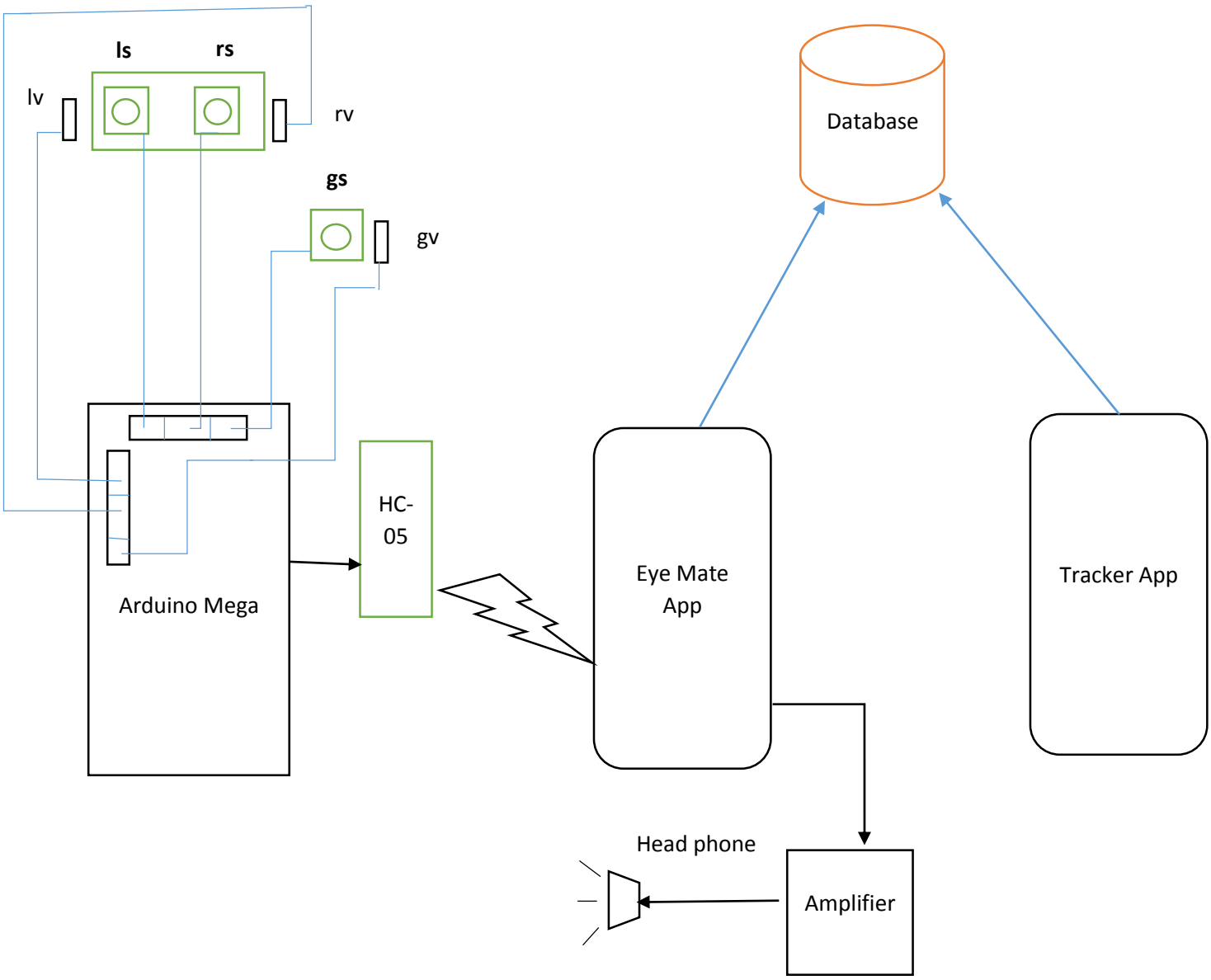
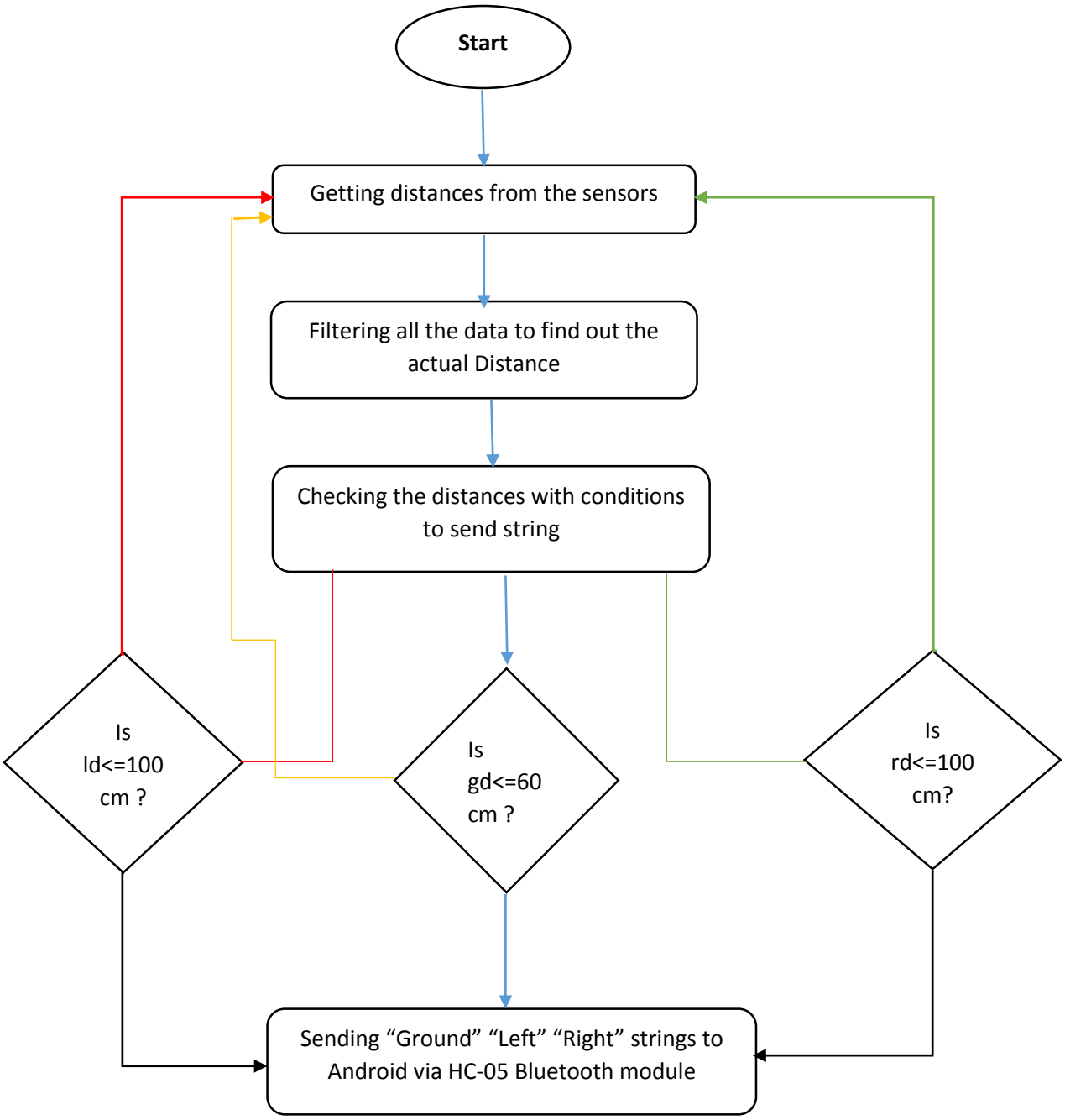


Fig: Diagram of the full system

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

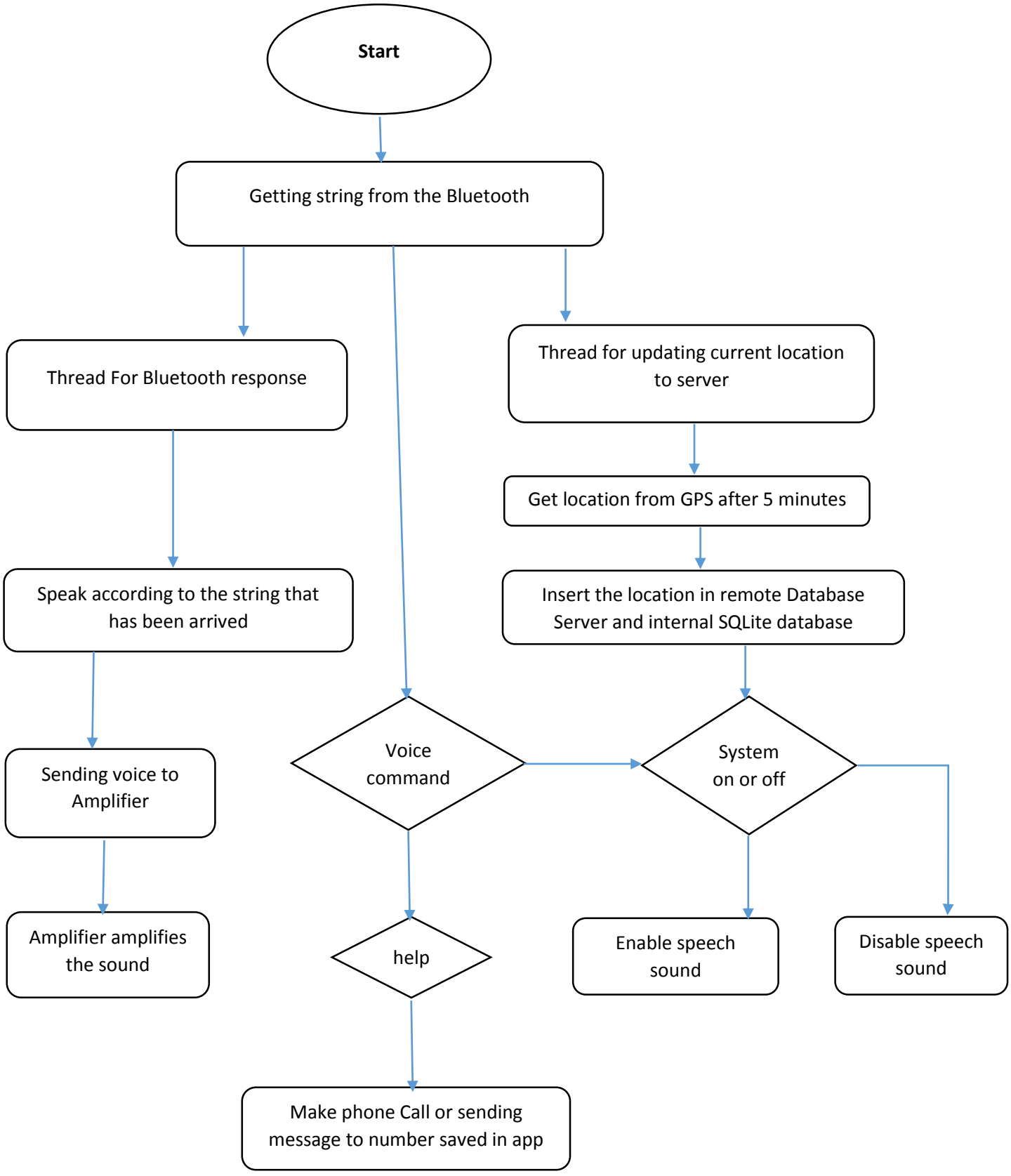
Lv = left vibrator , rv = right vibrator , gv = ground vibrator

Hardware Module Running Flow Chart:



Software Module Running Flow Chart:

Eye Mate App Module:



Tracker App Module: