Project Report
On

Tracking Moving Objects
On Mobile app

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Introduction

Moving object tracking system objective is to give security to all objects by using improved security systems created using latest technology like GPS which is highly useful now-a-days. This system enables the owner to monitor and track his/her object and identify object movements and its past activities.

This new technology, popularly called Object Tracking Systems which created many wonders in the security of the various object. This hardware is fitted on to the object in such a manner that it is not visible to anyone. Thus it is used as a covert unit which continuously or by any interrupt to the system, sends the location data to the monitoring unit.

When the object is stolen, the location data from tracking system can be used to find the location and can be informed to police for further action. Some Object tracking System can even detect unauthorized movements of the object and then alert the owner. This gives an edge over other pieces of technology for the same purpose.

This accident alert system in it detects the accident and the location of the accident of the object occurred and sends GPS coordinates to the specified mobile, computer etc. The fire detector circuit in it is used to detect fire in the object, if the temperature inside the object goes above a certain limit then a warning will be automatically send to the intend receiver. The infrared sensor which is additionally interfaced to the micro-controller is used to detect the obstacles and accidents, in any case if any mishap occurs then its warning will be directly send to the intended receiver.

When a request by user is sent to the number at the modem, the system automatically sends a return reply to that particular mobile indicating the position of the object in terms of latitude and longitude. A Program has been developed which is used to locate the exact position of the object and also to navigated track of the moving object on Google Map.

Proposed System

The proposed system is used for positioning and navigating the object with an accuracy of 10 m. The Exact location is indicated in the form of latitude and longitude along with the exact Navigated track on Google map.

The system tracks the location of particular object and sends to users mobile in form of data and also to micro-controller. The arrived data, in the form of latitude and longitude is used to locate the object on the Google maps and to display the output on Android App.

Technologies Used

Project Title	Tracking Moving Objects
Platform	Web Application & Mobile
Software	Android studio
Database	Web server (Thingspeak)
Hardware	ATMega 328 (Arduino Uno)
Locator	Global positioning system
Location on	Google Maps
Transmitter	GSM
Networking of data	Web to Mobile app
IDE	Arduino 1.8.2

Module Information

The modules in the project is as follows:

- Login Module
- Access for Location
- Activation of H/W module
- Networking Data
- Location on Google Map
- Deactivation of Module

a.) **Login Module:**

In login module, admin has been provided login id & password through which he can login in to the application. Post successful login interface on mobile app will be visible through which tracking and monitoring of objects can be performed.

b.) **Access for Location:**

On main screen of app, there will be a pop up requesting approval for accessing the location of H/w device. By clicking OK , a request is being sent to the GSM system.

c.) **Activation of H/W module:**

 After receiving the request message ,the hardware system get activated and GPS will start locating the longitude and altitude of individual/object location and transfer it to micro-controller. After that we use internet of things concept and transfer the sensor/module data to web server or online app.

d.) **Networking Data:**

Networking of data means data flowing through H/w to web server and that web server is linked to mobile app which collect the info about the location and display the result.
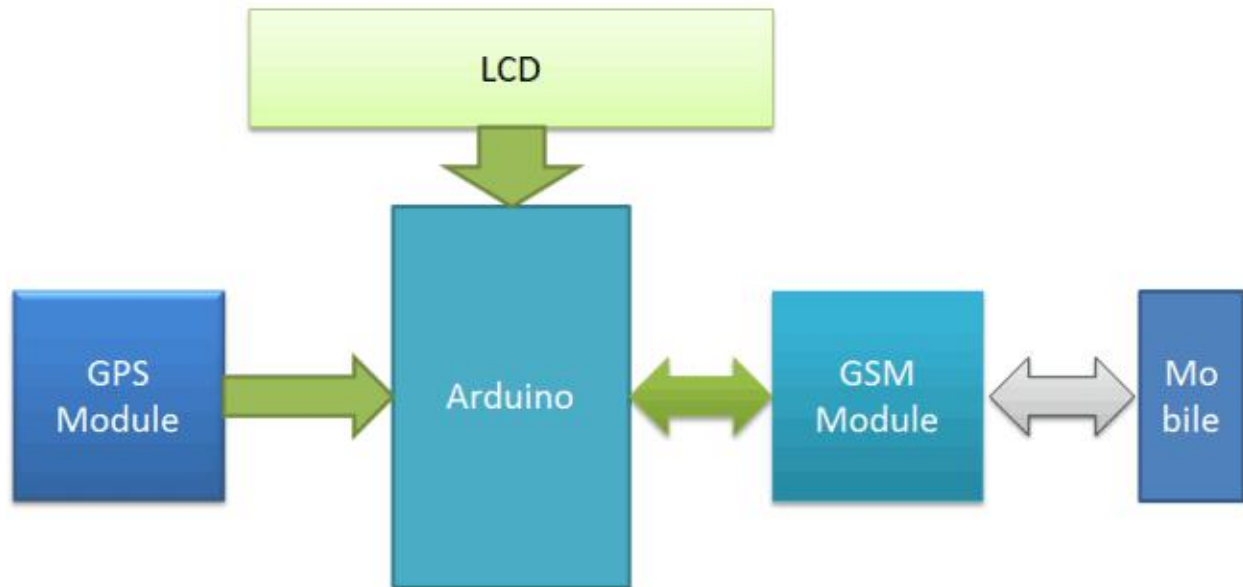
e.) **Location on Google Map :**

Accessing the web server to know the location of object, mobile application use the data[longitude & altitude] on Google map and locate the exact location and it uses constantly the new data that server is received from H/w and keep updating the location of object according to the information received.

f.) **Deactivation of H/W Module:**

After monitoring the movement of object on mobile application , if user want to shut down the working of h/w ,this can be done by sending a request again to the system. When request is acknowledge by the h/w system GPS stop the processing the locating parameters for current position and micro-controller stop sending data to web server and then we can close the application.

Block Diagram

The circuitry of the above given block diagram can be understand as follow:-

ATmega328 Micro-controller

ATmega328 micro-controller (IC2) is the heart of the project that is used for interfacing to various hardware peripherals. It is a low-power CMOS 8-bit micro-controller based on the AVR enhanced RISC architecture. ATmega328 micro-controller is interfaced serially

to a GPS module and GSM modem. The GPS module outputs has many data but in this project only the NMEA data is read and processed by the micro-controller. The processed data is sent to the user's mobile through a GSM modem.

This project design implements RS-232 protocol for serial communication between the micro-controller, GPS and GSM modem. A serial driver IC MAX232 (IC3) is used for converting RS-232 voltage levels into TTL voltage levels.

The user's mobile number should be included in the source code written for the micro-controller. Thus the user's mobile number resides in the internal memory of the MCU.

GPS

GPS is a space-based satellite navigation system. It provides location and time information in all weather conditions, anywhere on or near the Earth. GPS receivers are popularly used for navigation, positioning, time dissemination and other research purposes. All the GPS satellites transmit radio signals, which are then captured by a GPS receiver and used to calculate its geographical position. A minimum of four satellites may be required to compute the four dimensions of X, Y, Z (latitude, longitude and elevation) and time.

GSM modem.

A GSM modem is a specialized type of modem that accepts a SIM card and operates over a subscription to a mobile operator just like a mobile phone.

In this project, we have used SIM300 GSM modem (refer Fig. 4). GSM modem transmits and receives the data. Modem SIM300 is a tri-band GSM/GPRS engine that works on frequencies EGSM 900 MHz, DCS 1800 MHz and PCS 1900 MHz.

Transmit pin TXD and receive pin RXD of GSM modem are connected to the micro-controller (IC2) via MAX232 (IC3). Port pin PD0 (RXD) and port pin PD1 (TXD) of the micro-controller are connected to pins 12 and 10 of MAX232, respectively.

Power supply.

The circuit is powered off a 9V battery. 7805 regulator (IC1) is used to convert 9V into 5V. The micro-controller and MAX232 are powered by 5V. LED1 indicates the presence of power supply.

For GSM transmission it requires more power(current) through it's module so that purpose we separately provide a 12v DC supply to GSM module to successfully transmit the signal.
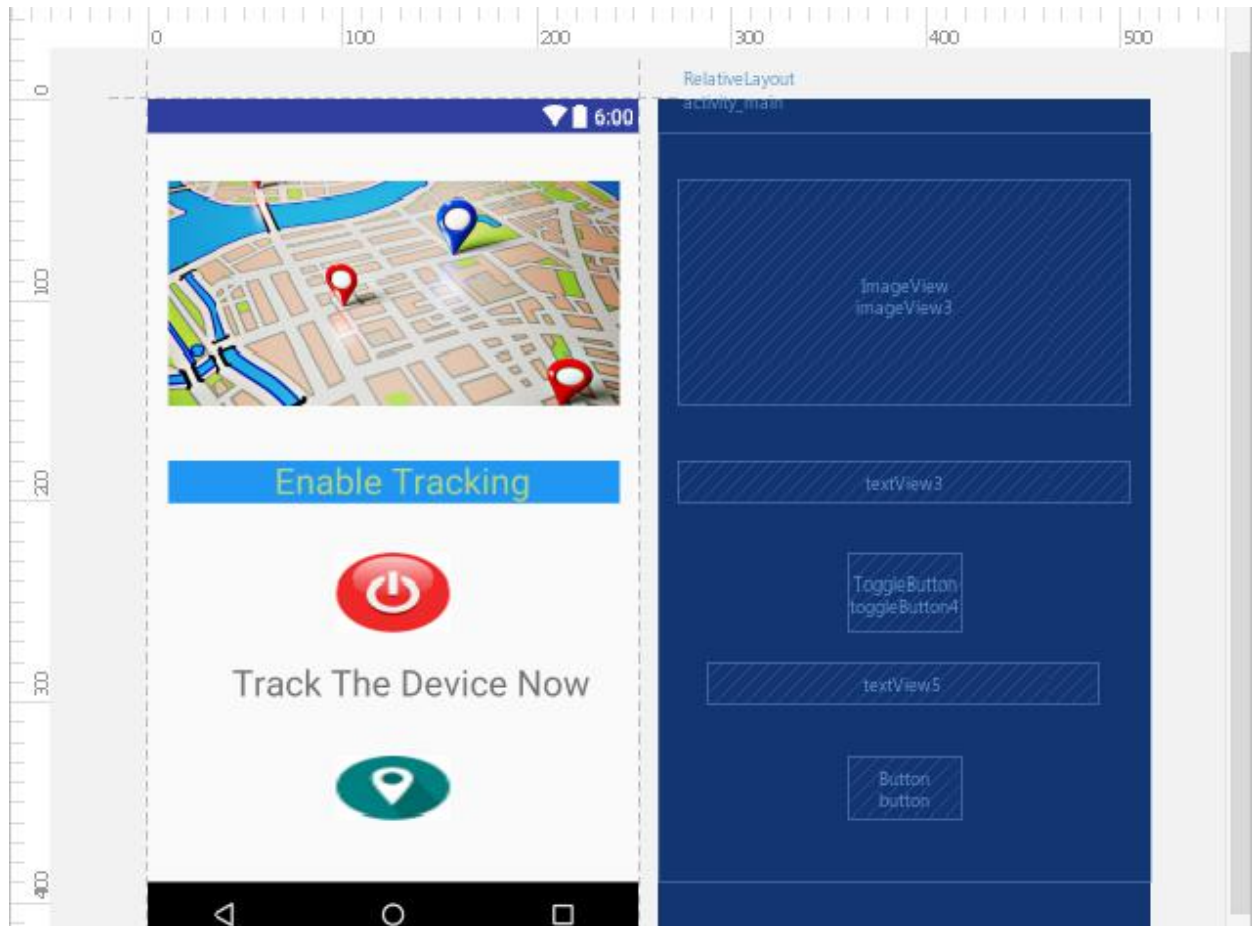
Screen Shots

1. Layout Design

IMAGE: 1

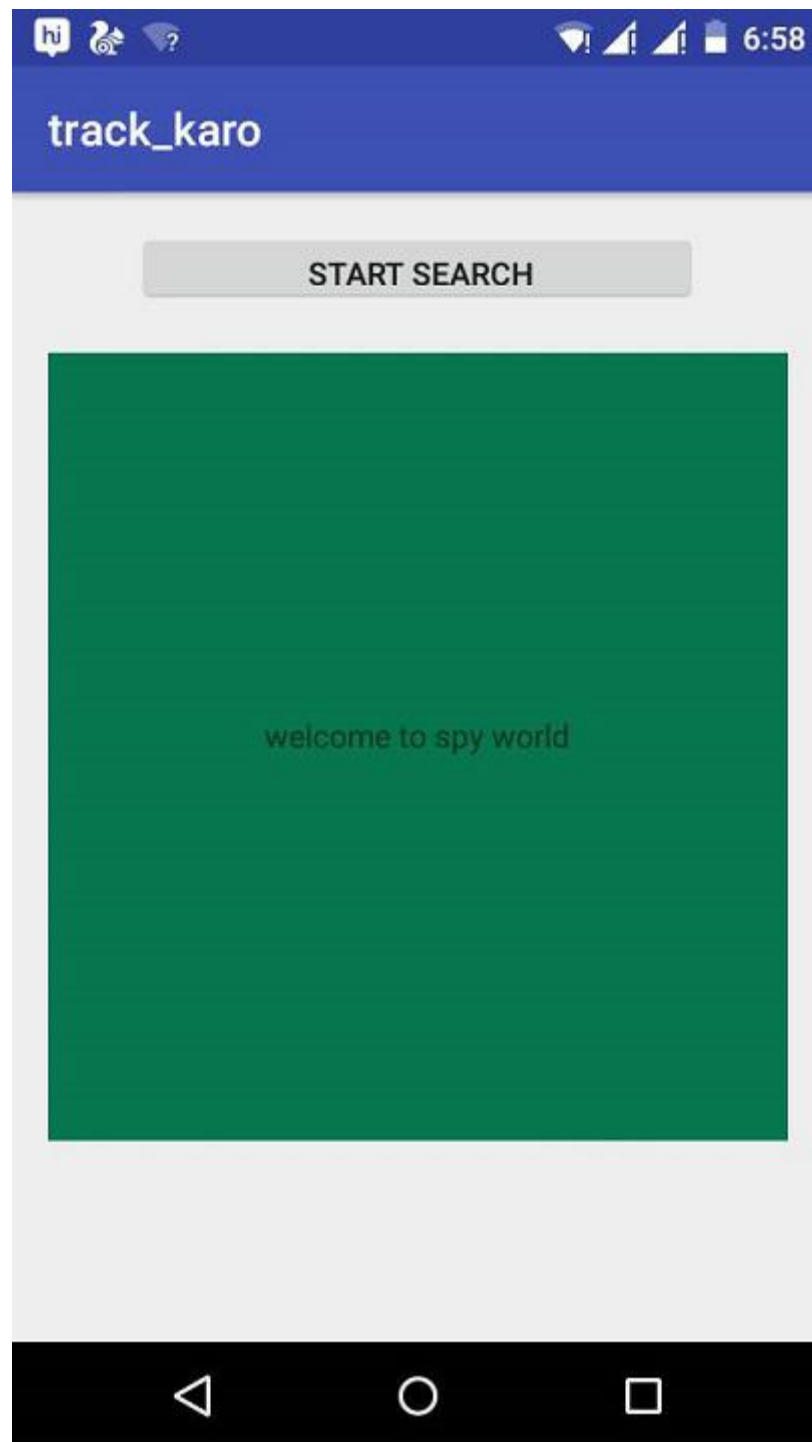## 2. Home Screen of App

Image: 2

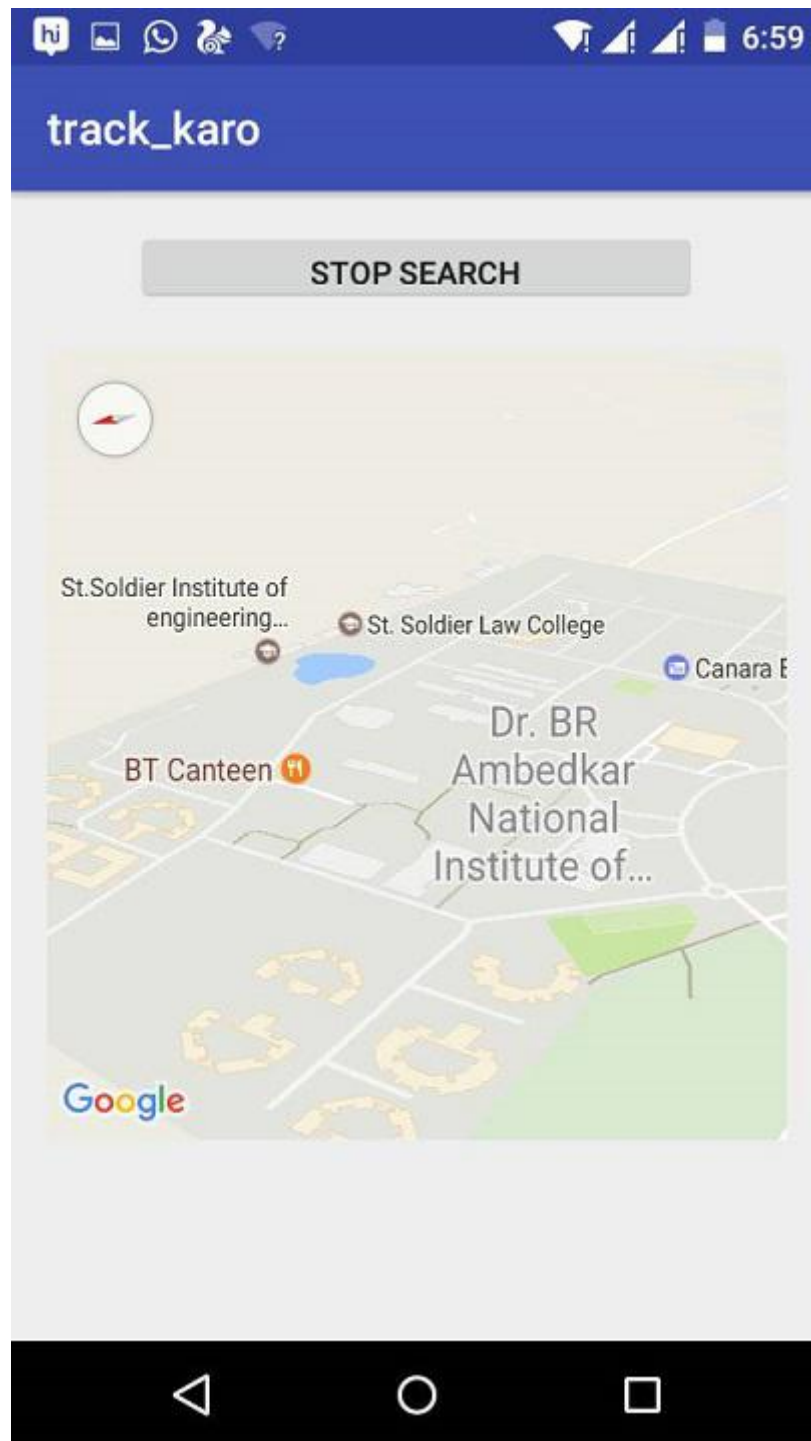### 3. Location Tracking

Image: 3
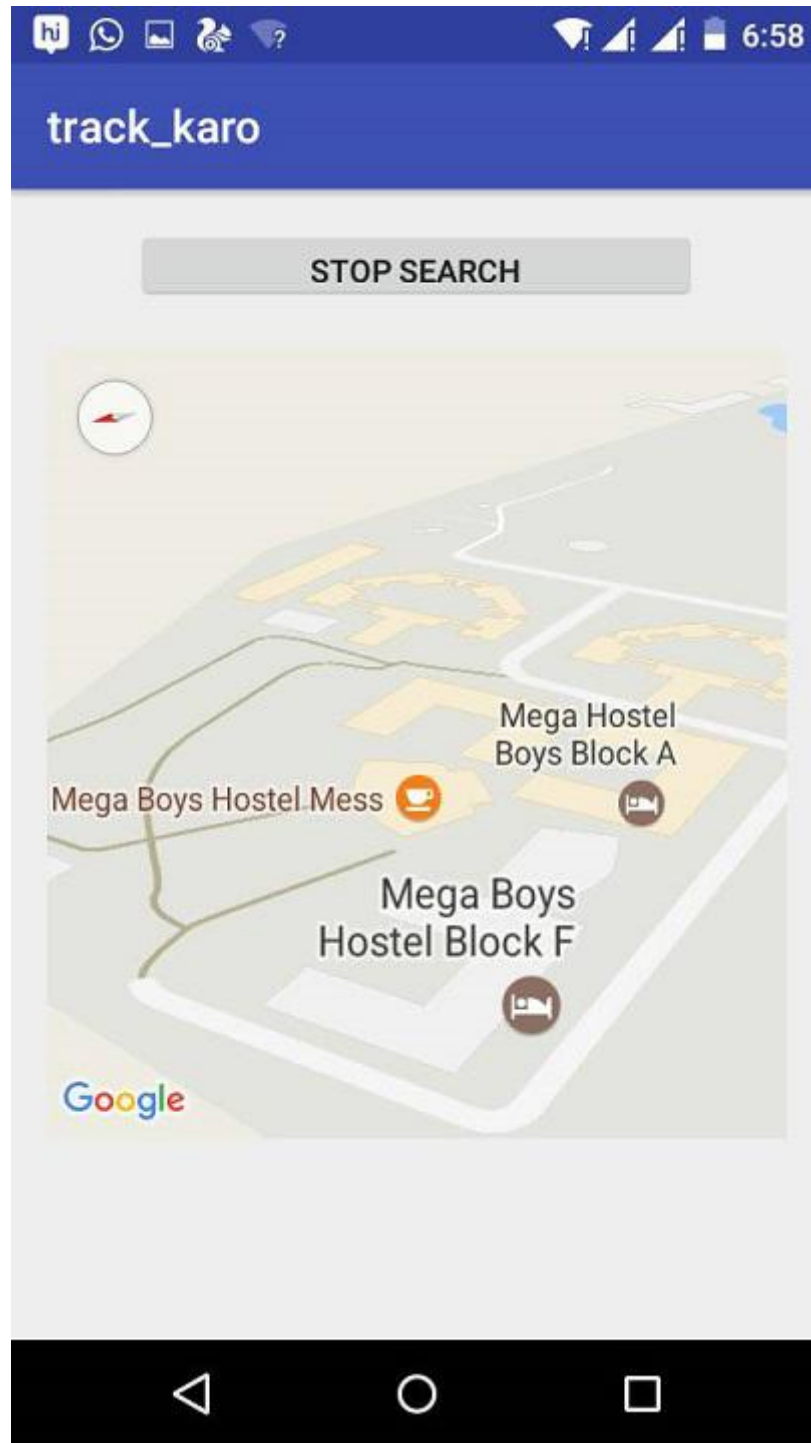
4. Zooming into the Location

Image: 4

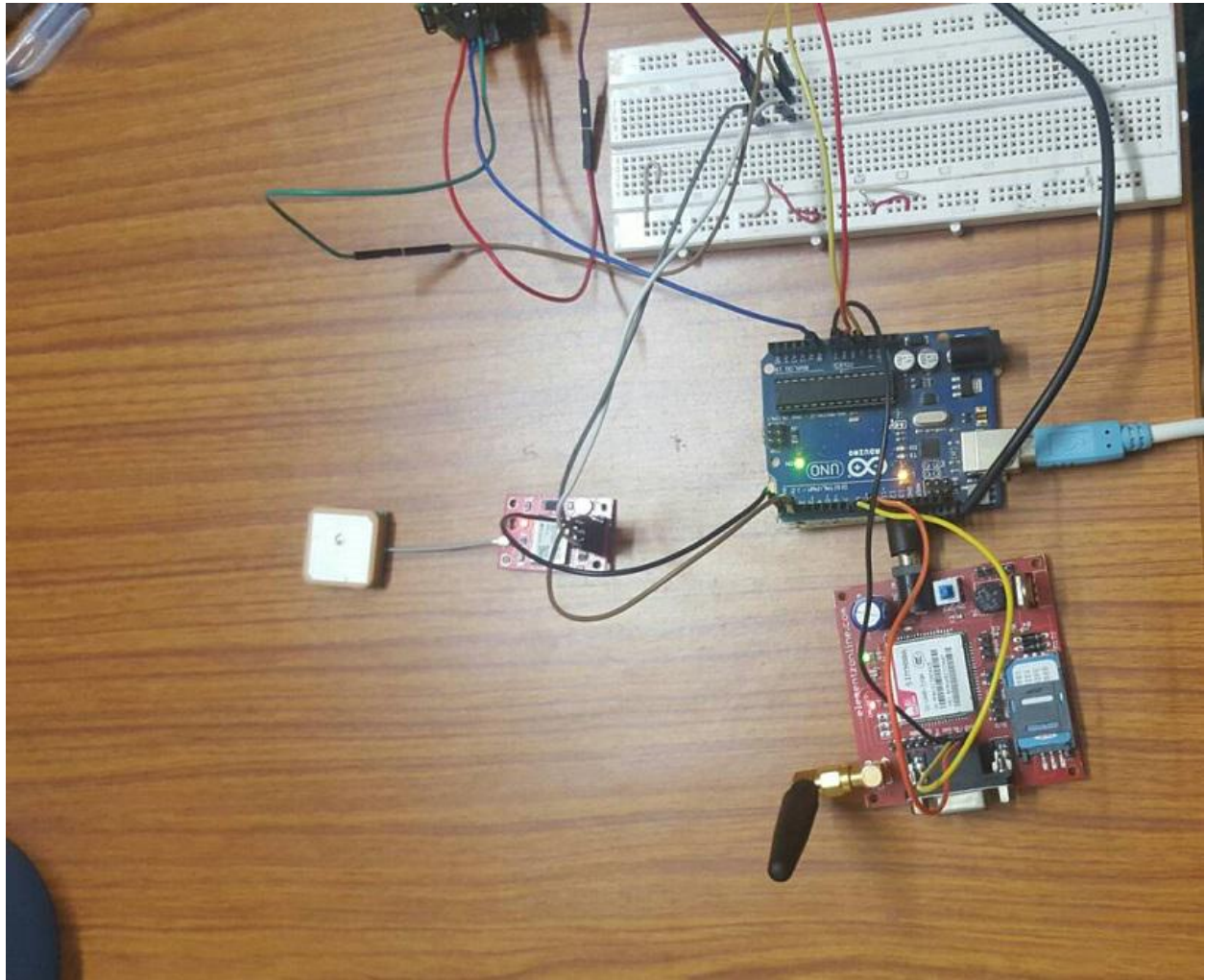**5. Basic Circuitry comprising of GSM module, GPS module and Arduino Uno   Board**

Image: 5

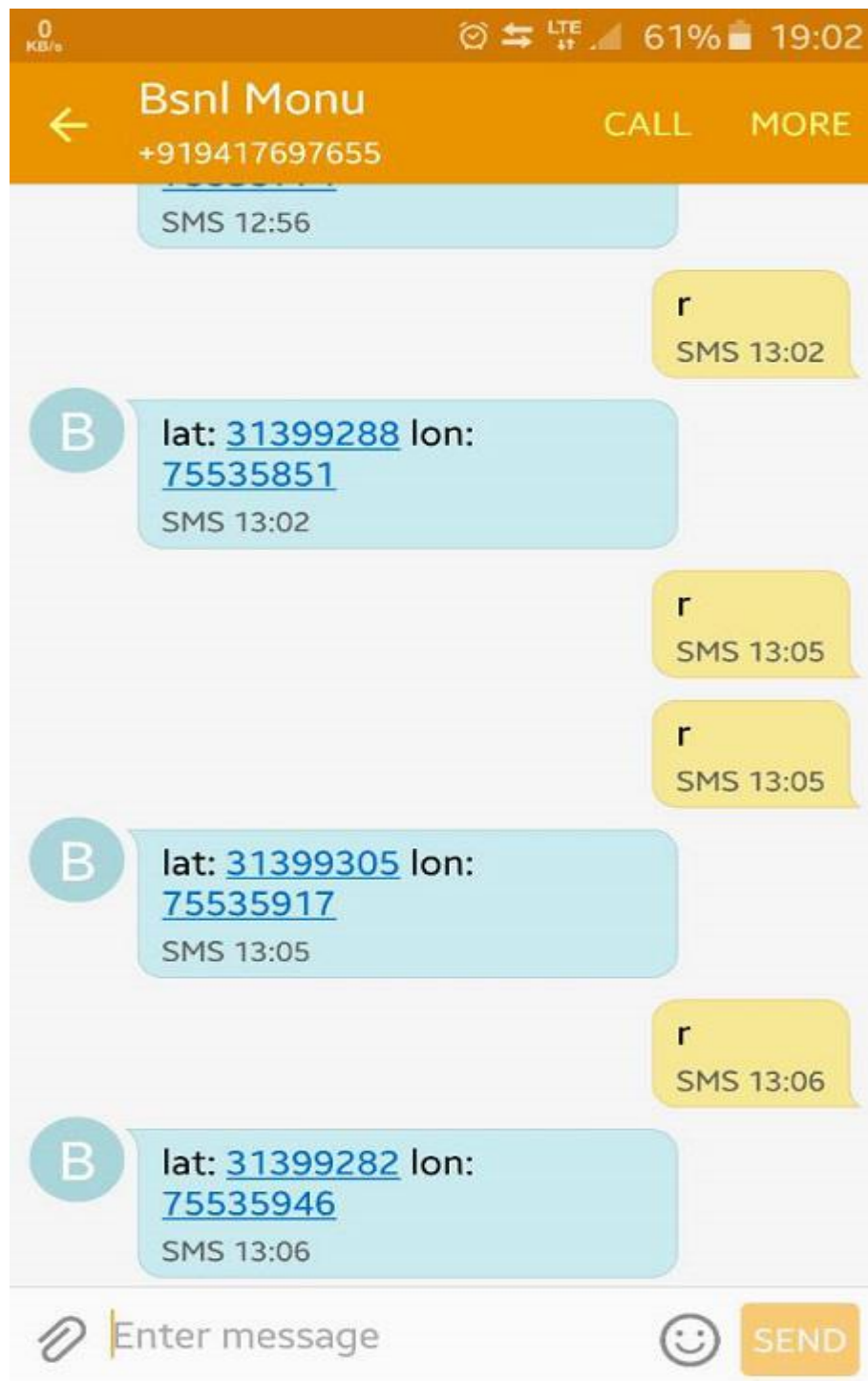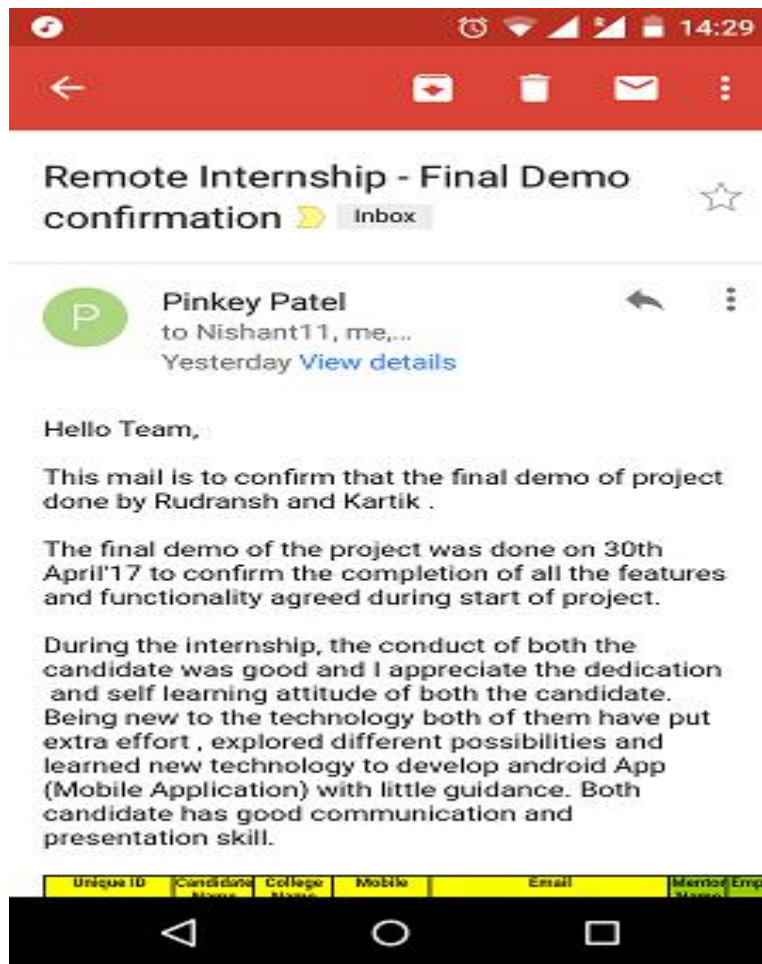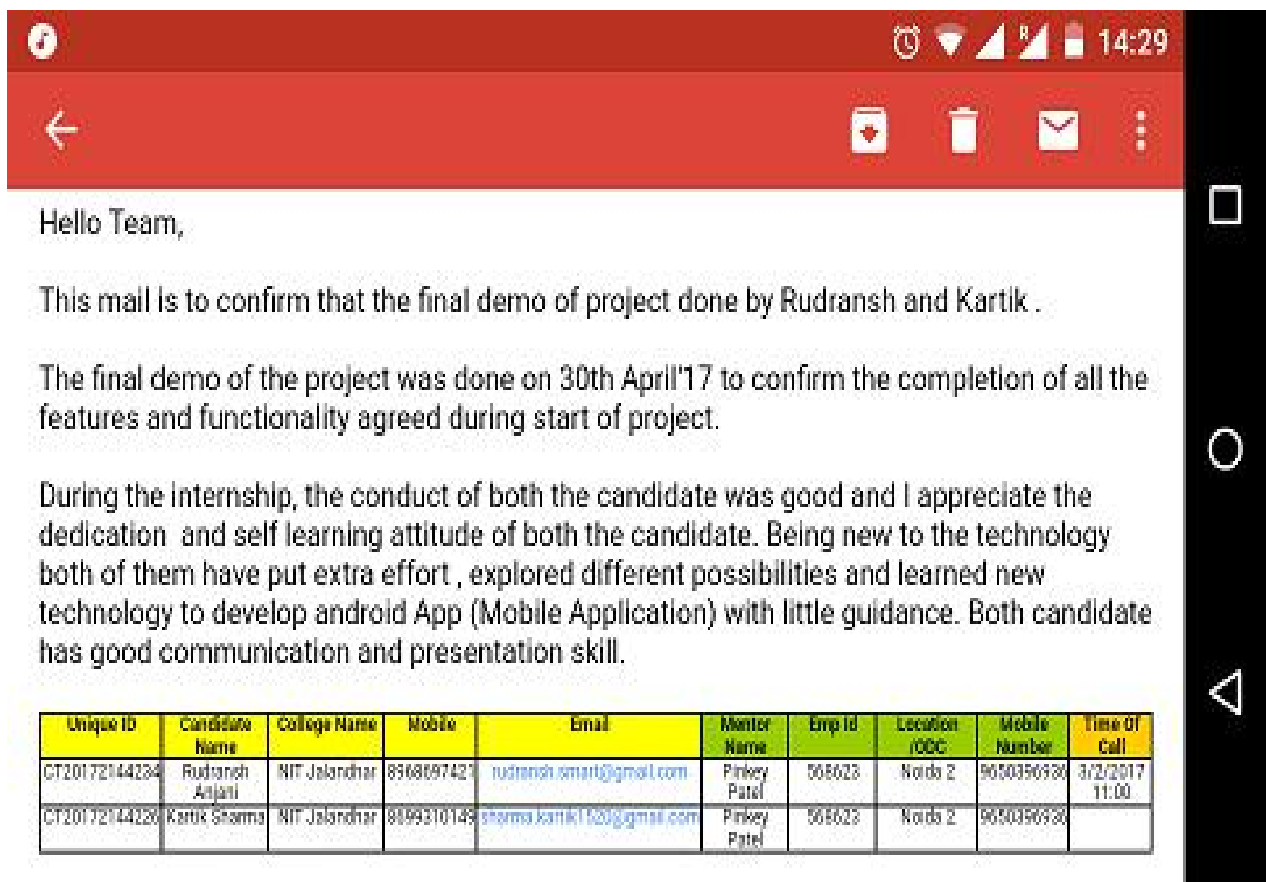## 6. Message Reception (Through GSM module- SIM900)

Image: 6

Demonstration

The final demonstration was conducted on 30-April-2017 where the proper working of project was presented on Hangout. We discussed the various application of the project together with the scope of improvement.

Here we attach the proof of demonstration.

Hello Team,

This mail is to confirm that the final demo of project done by Rudransh and Kartik .

The final demo of the project was done on 30th April'17 to confirm the completion of all the features and functionality agreed during start of project.

During the internship, the conduct of both the candidate was good and I appreciate the dedication and self learning attitude of both the candidate. Being new to the technology both of them have put extra effort , explored different possibilities and learned new technology to develop android App (Mobile Application) with little guidance. Both candidate has good communication and presentation skill.

Unique ID	Candidate Name	College Name	Mobile	Email	Mentor Name	Emp Id	Location /ODC	Mobile Number	Time of Call
CT20172144234	Rudransh Anjani	NIT Jalandhar	8968697421	rudransh.smart@gmail.com	Pinkey Patel	565623	Noida 2	9650356930	3/2/2017 11:00
CT20172144226	Kartik Sharma	NIT Jalandhar	9599310149	sharma.kartik123@gmail.com	Pinkey Patel	565623	Noida 2	9650356930	

Future Enhancements

Many features can be further added in this project. Some of the enhancements in this project in future include:

➢ We can use the EEPROM to store the previous Navigating positions up to 256 locations and we can navigate up to N number of locations by increasing its memory.

➢ We can reduce the size of the kit by using GPS+GSM on the same module.

➢ We can increase the accuracy up to 3m by increasing the cost of the GPS receivers.

➢ We can use our kit for detection of bomb by connecting to the bomb detector.

➢ With the help of high sensitivity vibration sensors we can detect the accident. Whenever object unexpectedly had an accident on the road with help of vibration sensor we can detect the accident and we can send the location to the owner, hospital and police.

➢ We can use our kit to assist the traffic in case of object being vehicle. By keeping the kits in the entire vehicles and by knowing the locations of all the vehicles.

➢ If anybody steals our vehicle we can easily find our vehicle around the globe.

Conclusion

Object tracking system makes better fleet management and which in turn brings large profits. Better scheduling or route planning can enable you handle larger jobs loads within a particular time. Object tracking both in case of personal as well as business purpose improves safety and security, communication medium, performance monitoring and increases productivity. So in the coming year, it is going to play a major role in our day-to-day living.

Main motto of the project is to incorporate different types of sensors so that they help in decrease the chances of losing life in such accident which we can't stop from occurring. Whenever accident is alerted the paramedics are reached to the particular location to increase the chances of life. This device invention is much more useful for the accidents occurred in deserted places and mid nights. This object tracking and accident alert feature plays much more important role in day to day life in future.

Sources

While undergoing this project, we were aided by various people. Apart from them, we took help from various YouTube video tutorials. Some of the significant references are:-

➢ Udacity: Course for Android App Development (https://in.udacity.com/)

➢ Arduino Tutorials

➢ Thingspeak IoT platform (https://thingspeak.com/)

➢ Circuit Digest Web portal (https://circuitdigest.com/)

➢ Instructable web portal for Arduino Codes (http://instructable.com/)

Apart from these, we also referred books of our concern.