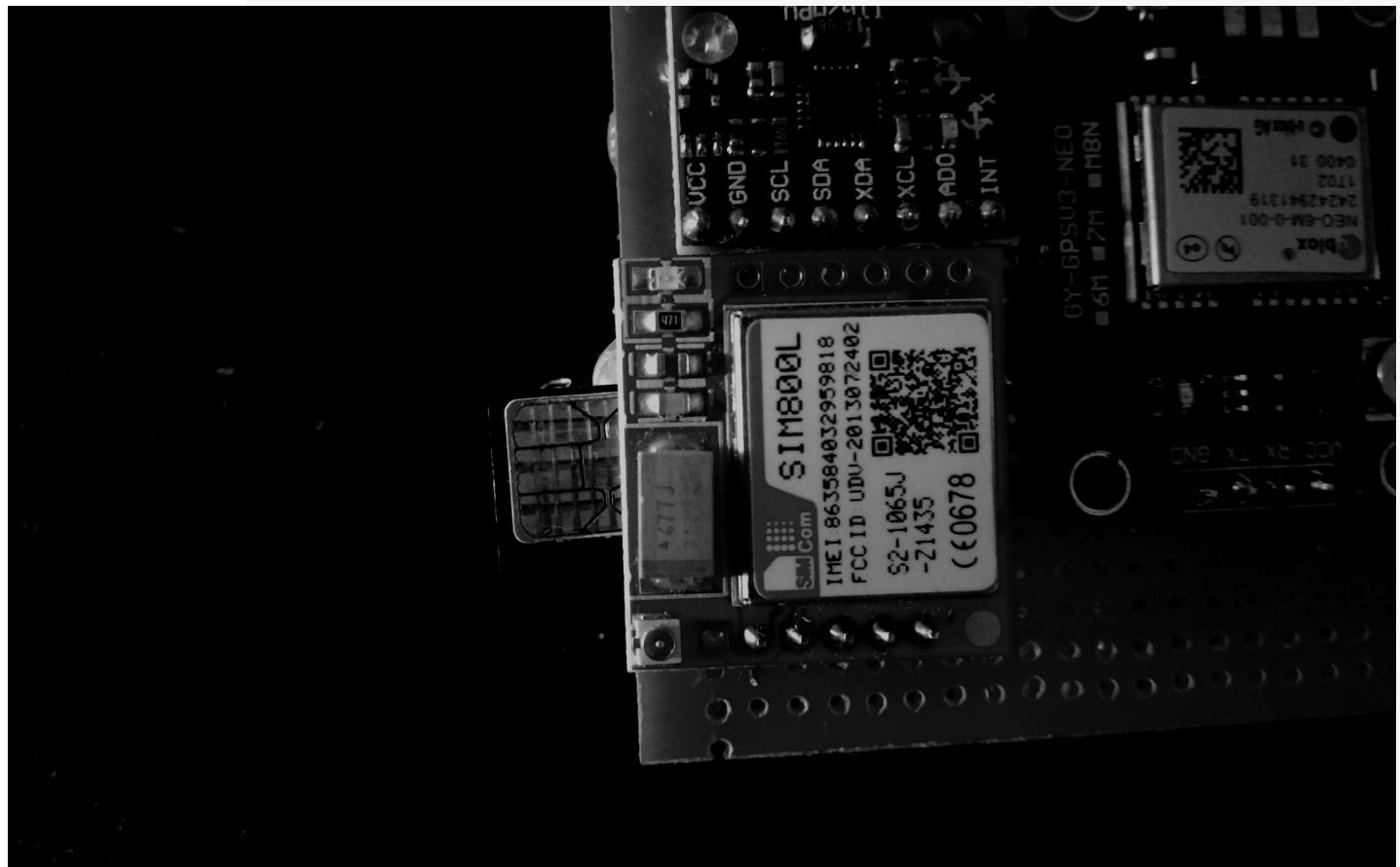


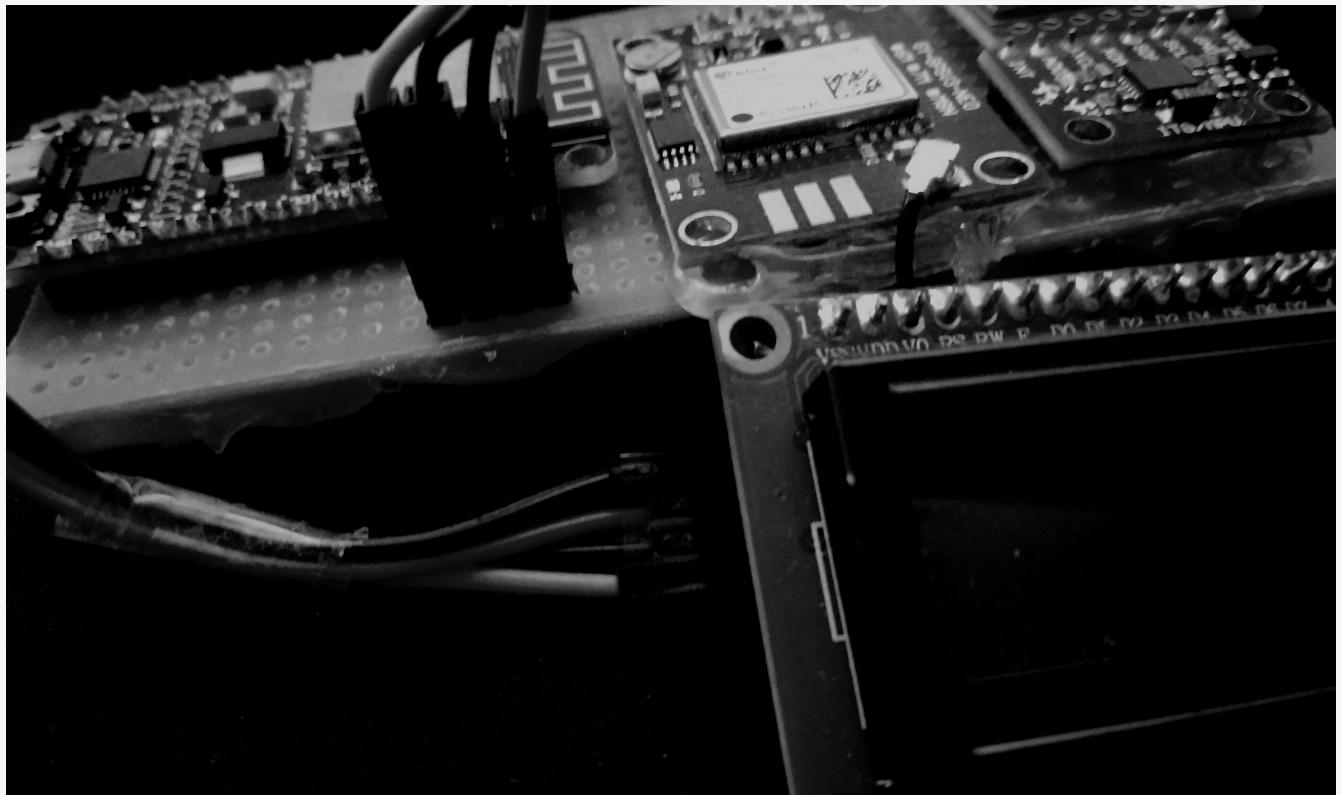
TEAM PARKO

PROJECT REPORT



PREPARED AND PRESENTED FOR
INNOVATE FOR

ABOUT OUR PROJECT



SMART MOVEMENT TRACKING SOLUTION OF PEOPLE/VEHICLES FROM POINT A TO POINT B:

For this problem statement we have decided to go with two solutions.

- One for tracking of people/vehicle anywhere in India with a dashboard for monitoring.
- And the other solution is to monitor the entry and exit of areas like Kaziranga forest.

In this document both these solutions are explained in detail.

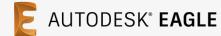
TOOLS USED

Almost all the tools used in this project is opensource or free to use (except google maps API and ngrok). Even google maps is free to use till a certain limit. This project can be reproduced and setup anywhere with slight modifications to our source code. Here is a list of tools and languages that we used for this project.

Number plate recognition



PCB Design



Electronics-related tools

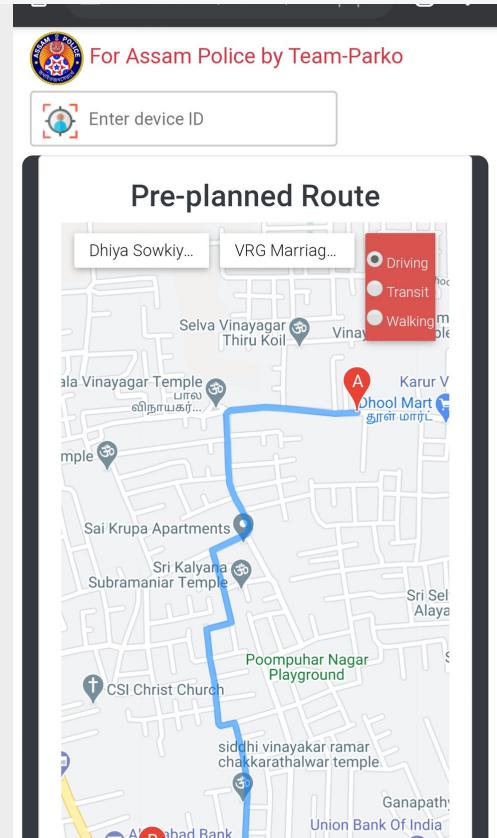


Web development and deployment



REMEMBER THIS BEFORE PROCEEDING FURTHER

As mentioned earlier, the solution we are proposing or submitting is divided into two, tracking vehicles/people and another solution for forest region. So, the files in repository are divided into 1_smart_vehicle_tracker and 2_tracker_for_forest_road, for ease of use. Both these folders have files related to that project. Let's continue :)



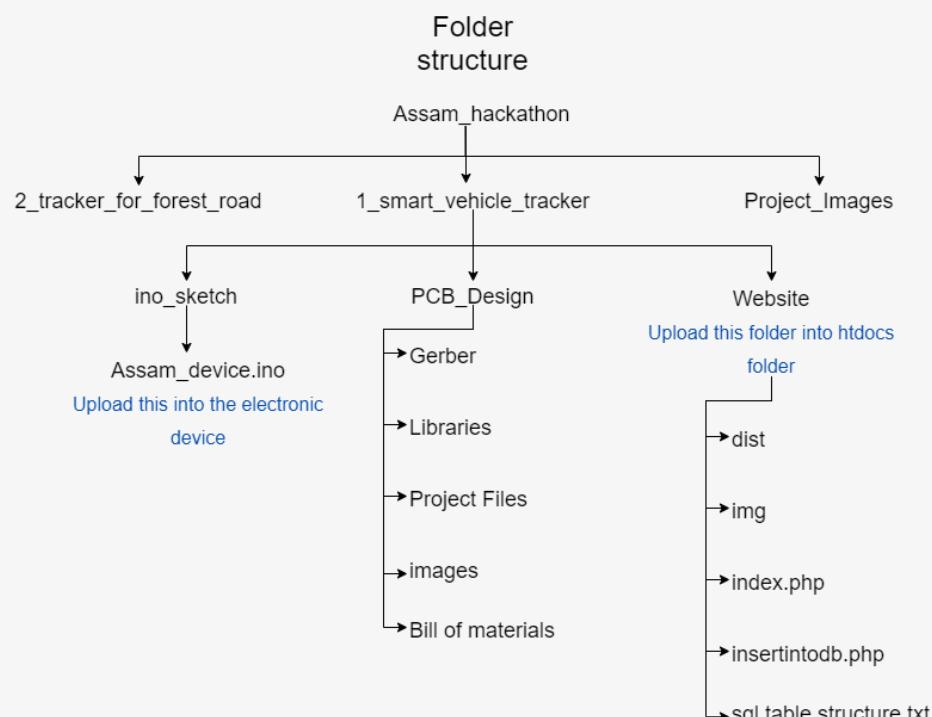
```

19 $speed = '';
20 $time = '';
21 $latitude = '';
22 $temperature = '';
23 $direction = '';
24 $km = '';
25
26
27 // fetch
28 $sql1 = "SE
29 ORDER BY id
30 LIMIT 0,20"
31 $sql2 = "SE
32 ORDER BY id
33 LIMIT 0,20"
34 $sql3 = "SE
35 LIMIT 0,1";
36
37 $result = my
38 $result2 = r
39 $result3 = r
40
41 while ($row
42     $latitude
43     $time = $i
44 }
45 while ($row
46     $lat = $re
47     $longitude
48 }
49     03    ($row
50     $temperatu
51     $speed = $i

```

1_SMART_VEHICLE_TRACKER

THIS SECTION INCLUDES THE FOLDER STRUCTURE, PROJECT PROCESSES, IMPLEMENTATION, AND EXECUTION.



ino_sketch>Assam_device.ino

Upload this code into the electronic device. Look for this snippet and replace the Password, IP address and SSID. If you're using ngrok, use that address in char server[]

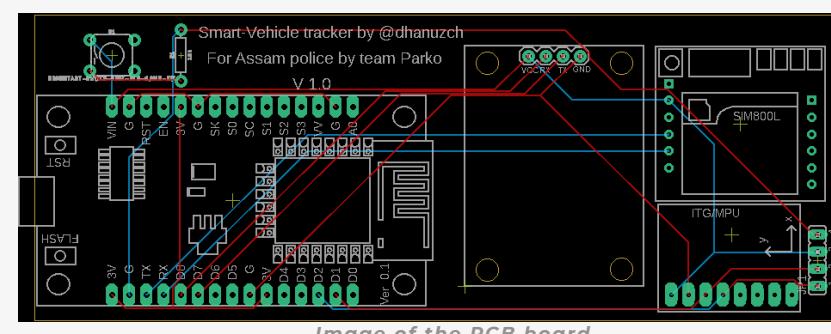
```

const char* ssid = "HOT_SPOT_NAME"; //replace this with ssid of hotspot (comment this if using GPRS)
const char* password = "HOT_SPOT_PASSWORD"; //replace this with password of hotspot (comment this if using GPRS)
char server[] = "192.168.0.105"; // change the ip address accordingly...if using ngrock use that address

```

PCB Design>Gerber>GerberFiles.zip

Use this file, to print the PCB. Gerber files are universally accepted in PCB board manufacturing houses and online PCB printers such as JLCPCB



PCB Design>Libraries

It contains all the footprints and pinouts of the sensors and modules that are used in this project. This will be useful when designing your own PCB

PCB Design>Project Files

It contains all the schematics and board file, improvements can be made to existing design using these files

PCB Design>Bill of materials

It contains the list of components used in this project and it's price.

Website>index.php

After placing the website folder in htdocs, run this file with xampp or xampp+ngrok. And don't forget to enter your API key from google maps. To know how to generate an API key, visit <https://developers.google.com/maps/documentation/javascript/get-api-key>.

```
88 | <script
89 |   src="https://maps.googleapis.com/maps/api/js?key=YOUR_API_KEY_HERE&callback=initMap&libraries=places&v=weekly"
90 |   defer
91 | ></script>
```

*Insert the generated API key instead of
YOUR_API_KEY_HERE*

After that, replace theservername, username, password and dbname with your credentials and dbname.

```
3  <?php
4  $servername = "127.0.0.1";
5  $username = "root";
6  $password = "";
7  $dbname = "assam_police_hackathon";
```

Website>insertintodb.php

No alteration is needed in this file. This is used to get data from the electronic device over GSM or WiFi and insert that data into database

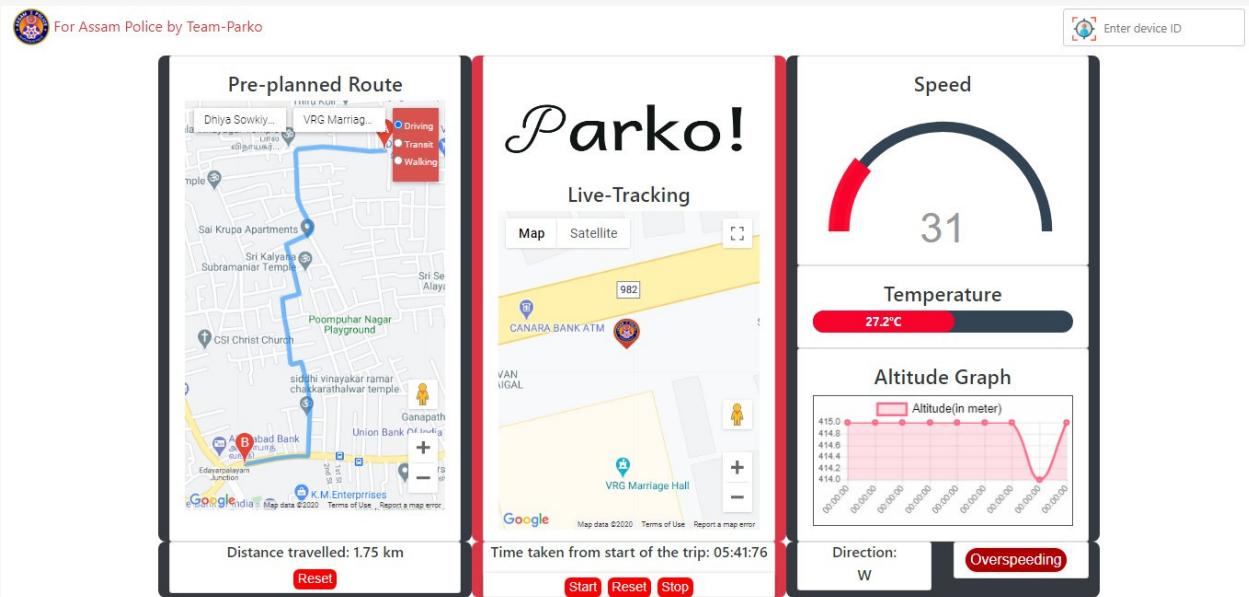
Website>sql table structure.txt

This file contains the sql command to replicate the table used in this project.

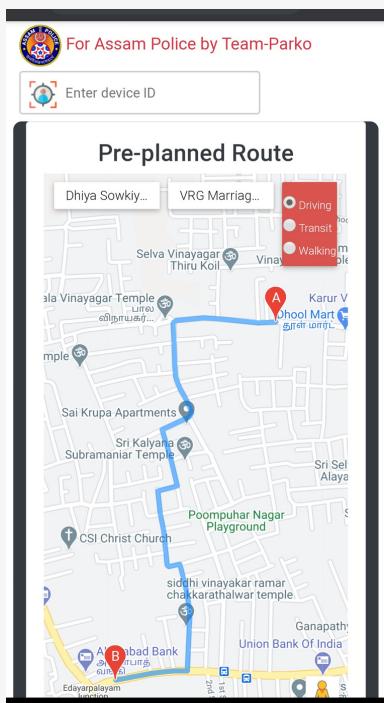
FYI: dbname we used is assam_police_hackathon

PROJECT IMAGES

FOR EXPLANATION OF THE WEBSITE,
VIEW THE VIDEO



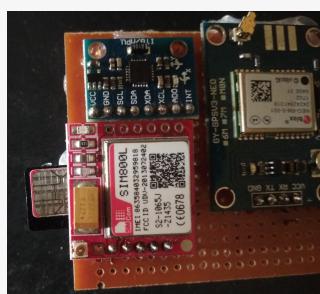
Look of the monitoring website



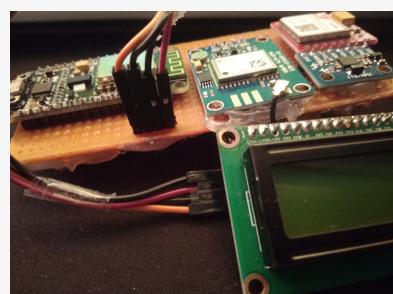
Look of the monitoring website in
mobile phone



The electronic tracker



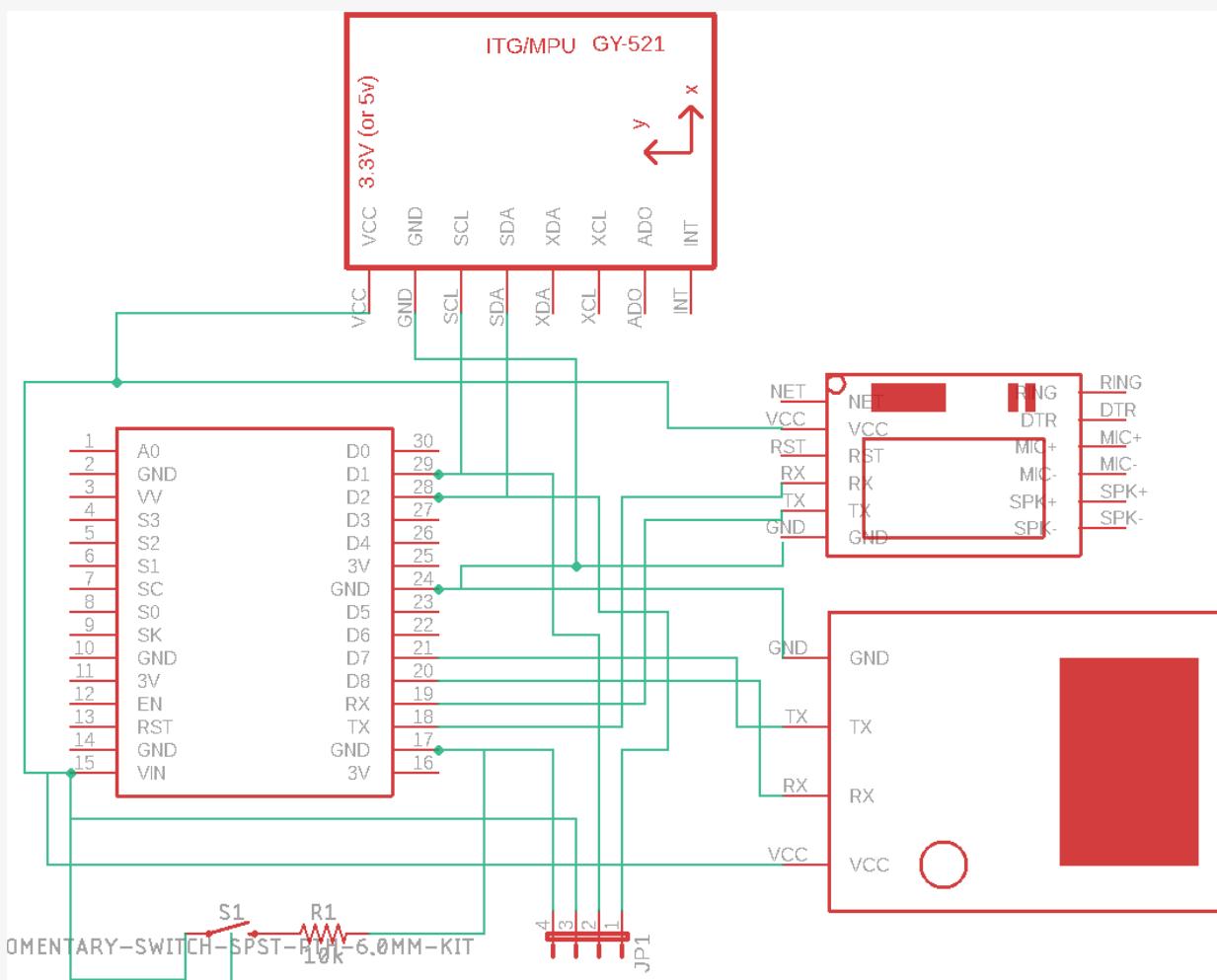
Sim card slot in the device



The LCD display can be inserted or removed whenever we want. We used it to see if the device was working properly



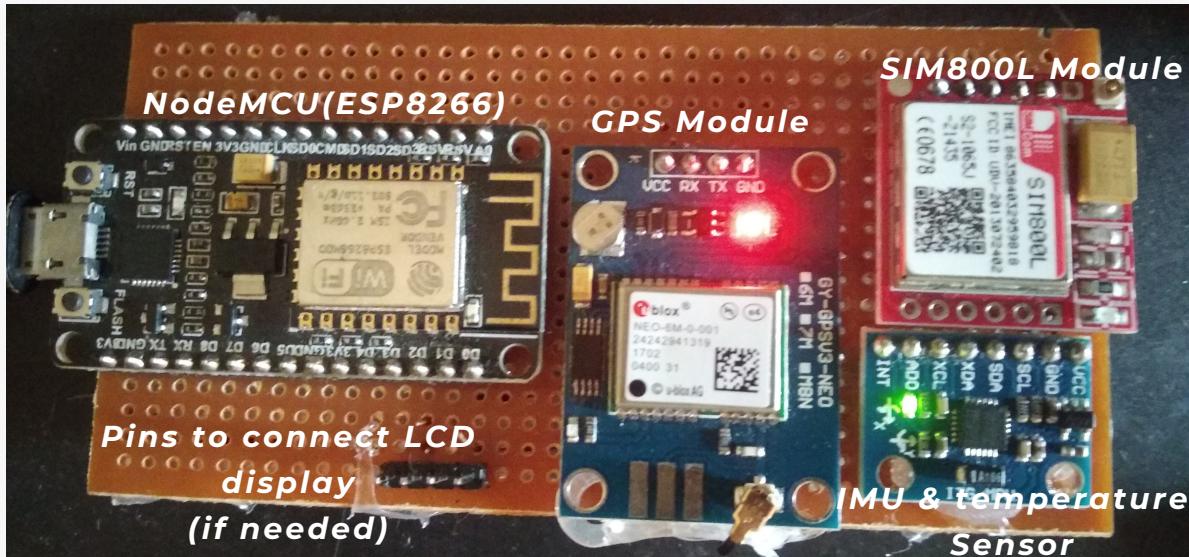
The LCD display, displays latitude, longitude, speed and temperature. It can be changed in assam_final.ino



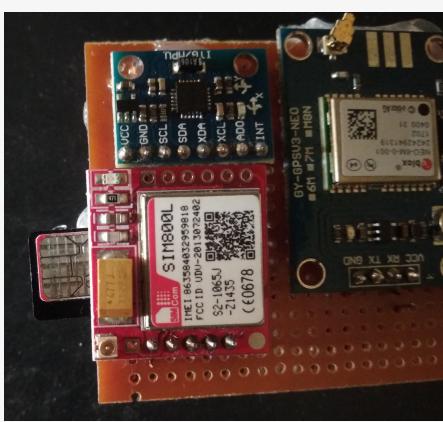
Schematics of the PCB Board. Additionally the connection instructions are given in ino_sketch>Assam_device.ino

OVERVIEW OF ELECTRONIC TRACKER

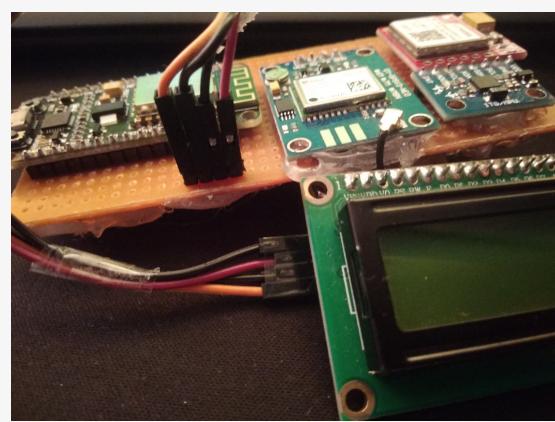
FOR EXPLANATION OF THE TRACKER, VIEW THE VIDEO



The thickness of this device is less than 10mm, the size and length can be further reduced when manufactured in large scale. As of now, the dimensions of the prototype are 100 X 50 X 9.5mm (LCD Display not included)



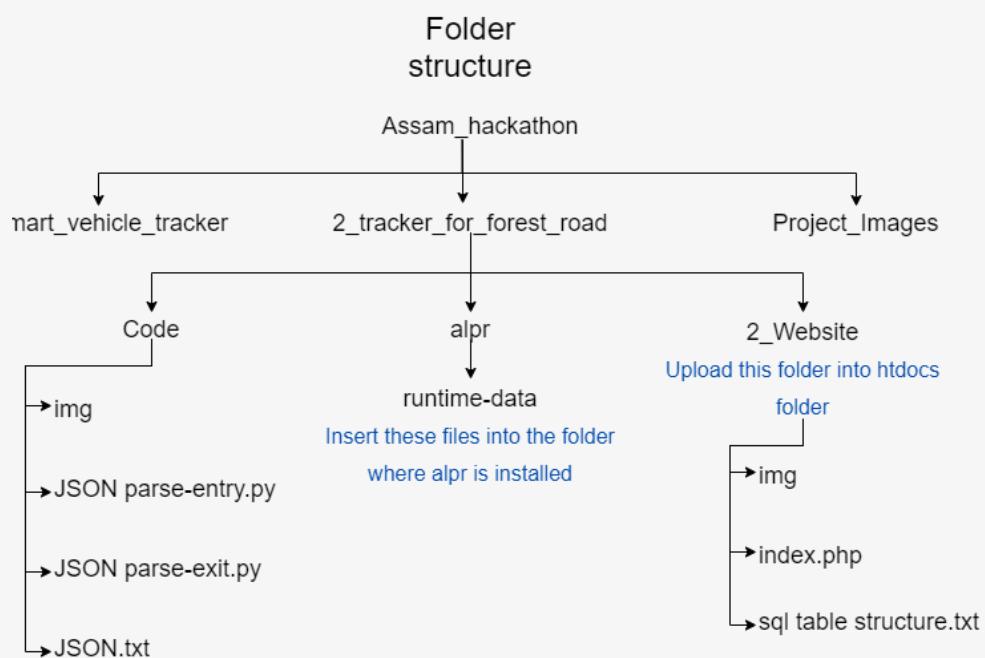
Sim card slot in the device



The LCD display can be inserted or removed whenever we want. We used it to see if the device was working properly

2_TRACKER_FOR_FOREST_ROAD

THIS SECTION INCLUDES THE FOLDER STRUCTURE, PROJECT PROCESSES, IMPLEMENTATION, AND EXECUTION.



IMPORTANT

To use this code you need to install a python library called OpenALPR. To install it, visit <https://github.com/openalpr/openalpr> and follow the tutorials.

OpenALPR requires the following additional libraries:

- Tesseract OCR v3.0.4 (<https://github.com/tesseractocr/tesseract>)
- OpenCV v2.4.8+ (<http://opencv.org/>)

Install the above libraries as well.

alpr>runtime_data

After the installing the opensource version of Openalpr. Copy the contents of this folder to the openalpr installation runtime directory. This enables the OpenALPR library to recognize Indian number plates.

2_Website

Paste this folder into htdocs folder.

2_Website>index.php

After pasting in htdocs folder, open index.php file and replace the servername, username, password and dbname with your credentials and dbname.

```
<?php  
$servername = "127.0.0.1";  
$username = "root";  
$password = "";  
$dbname = "assam_police_hackathon";
```

"alpr_results":
:1601307285000
259,
:194,
time_ms":60.55
interest":[],

"MH12DE1433",
ence":89.317581
_template":1,
ndex":0,
:"base",
confidence":8,
sing_time_ms":4
ed_topn":1,
ates": [{"x": -1
tes":

ate":"MH12DE1433",
confidence":89.317581
ches_template":1,

Code>img

It contains the images of cars with number plates that were used to check the working of license plate recognition

Code>JSON parse-entry.py

This is a python script, that inserts the data acquired from 'license plate recognition placed in entry' into database.

Code>JSON parse-exit.py

This is a python script, that inserts the data acquired from 'license plate recognition placed in exit' into database.

Website>sql table structure.txt

This file contains the sql command to replicate all the tables used in this project.

FYI: dbname we used is assam_police_hackathon

Using openALPR

Open command prompt in the location where openALPR was installed, and then you can use it with the following commands

```
alpr --help
```

USAGE:

```
alpr [-c <country_code>] [--config <config_file>] [-n <topN>] [--seek  
      <integer_ms>] [-p <pattern code>] [--clock] [-d] [-j] [--]  
      [--version] [-h] <image_file_path>
```

Where:

```
-c <country_code>, --country <country_code>  
  Country code to identify (either us for USA or eu for Europe).  
  Default=us  
--config <config_file>  
  Path to the openalpr.conf file  
-n <topN>, --topn <topN>  
  Max number of possible plate numbers to return. Default=10  
--seek <integer_ms>  
  Seek to the specified millisecond in a video file. Default=0  
-j, --json  
  Output recognition results in JSON format. Default=off  
--, --ignore_rest  
  Ignores the rest of the labeled arguments following this flag.  
--version  
  Displays version information and exits.  
-h, --help  
  Displays usage information and exits.  
<image_file_path>  
  Image containing license plates
```

Using openALPR

For India you can use the following commands:

For recognizing the images

```
alpr -c in image.jpg
```

For recognizing the Videos

```
alpr -c in video.mp4
```

For recognizing using webcam

```
alpr -c in webcam
```

Command we used

```
alpr -c in -n 1 -j img\car4.jpg > JSON.txt
```

```
alpr -webcam
```

Explanation

-c in

it sets the country code to India

-n 1

it limits the output to the first best result

-j

results will be in JSON format

img\car4.jpg

location of the image

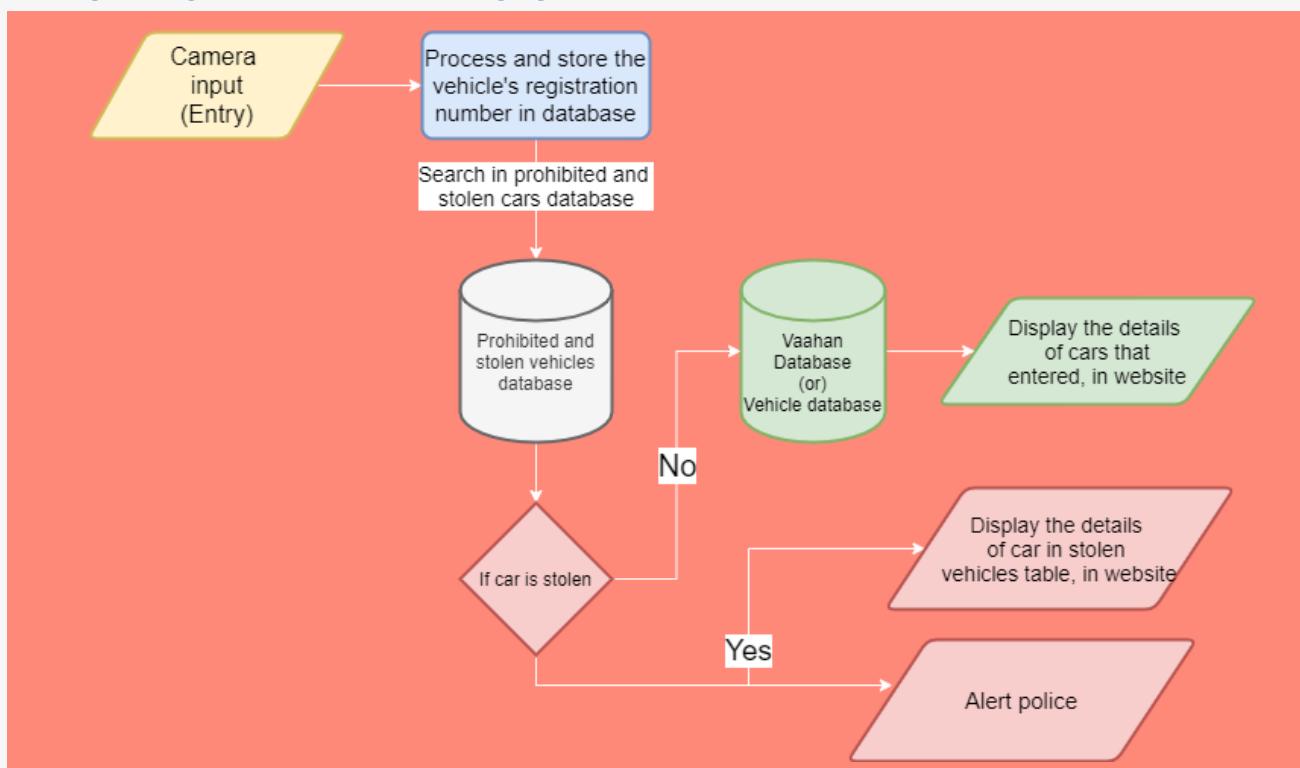
> JSON.txt

saves the output as JSON.txt

-webcam

starts reading number plate from camera stream

FLOWCHART-ALGORITHM



PROJECT IMAGES

FOR EXPLANATION OF THE WEBSITE,
VIEW THE VIDEO

For Assam Police by Team-Parko

The screenshot shows a road with 'ENTRY' and 'EXIT 1' on the left, and 'EXIT 2' on the right. Two white boxes display 'No. of cars entered (Today)' (7) and 'No. of cars in-between entry and exit' (6). To the right is a table titled 'Details of last 10 cars that entered'.

Reg. No.	Car	Colour
MH12DE1433	Ford Fiesta	Silver
TS08FT9099	Mercedes Benz GLA	Red
MH20DV2366	Skoda Superb	Silver
MH12DE1433	Ford Fiesta	Silver
TN01AS9299	Mahindra Xylo	Silver
KA05AG3766	Toyota Liva	Silver
MH01AV8866	Volkswagen Polo	Red

Details of prohibited vehicles(if any)

Reg. No.	Car	Colour
----------	-----	--------

Website of forest road tracker

A black overlay box says 'localhost says' and 'Prohibited vehicle entered' with an 'OK' button. The rest of the interface is identical to the first screenshot, showing the road, vehicle counts, and history table.

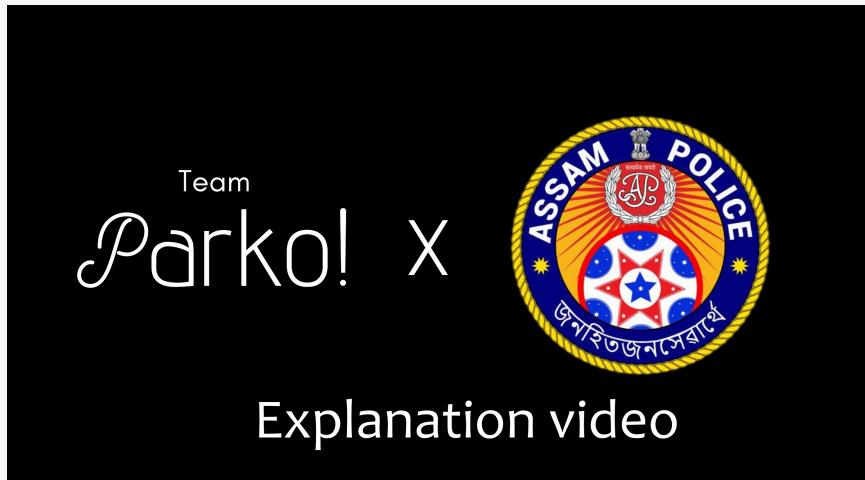
Reg. No.	Car	Colour
MH12DE1433	Ford Fiesta	Silver
TS08FT9099	Mercedes Benz GLA	Red
MH20DV2366	Skoda Superb	Silver
MH12DE1433	Ford Fiesta	Silver
TN01AS9299	Mahindra Xylo	Silver
KA05AG3766	Toyota Liva	Silver
MH01AV8866	Volkswagen Polo	Red

Details of prohibited vehicles(if any)

Reg. No.	Car	Colour
MH13BN8454	Audi A4	White

Alert when a prohibited vehicle enters the road

VIDEO LINK



THE TEAM



Nikhiil R
UI/UX dev



Dhanush B
Electronic engineer,
Back-end and
frontend dev



Pooja R
Electronic
engineer

ANY DOUBT? CONTACT US

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dhanush.mc18@bitsathy.ac.in

www.github.com/dhanuzch/Assam_hack

https://www.linkedin.com/in/dhanuzch/