IOT Based Track Crack Detection And Intimation System

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ABSTRACT

- One of the major transport medium is train. in india majority of the railway tracks have been improved with the latest technology.
- Accidents may occur due to some mechanical error, but often due to human error.
- Then lot of train accidents are occurring due to crack in the railway track due to which many people are losing their lives.
- This project work is aimed towards addressing the issue by developing an automatic railway track crack detection system.
- This work introduces a project that aims in designing robust railway crack detection scheme IR receiver sensor assembly system which avoids the train accidents by detecting the cracks on railway tracks

EXISTING SYSTEM

- The existing conventional signaling system depends on the oral communication through telephonic and telegraphic conversations as input for the decision making in track allocation for trains.

- There is large scope for miscommunication of the information or communication gap due to the higher human interference in the system.

- The statistics in the developing countries showing that 80% of worst collisions occurred so far is due to either human error or incorrect decision making through miscommunication in signaling and its implementation.

PROPOSED SYSTEM

- The proposed system uses multiple sensors for railway application. it consists of IR sensor, IR receiver the IR sensor will sense the crack in the railway track.

- The robotic model is interfaced with the microcontroller with the help of motor driver circuit. if any crack occurs in the track, the robot will be stopped and then a SMS will be send to the authorized person and also it will be directly updated on website.

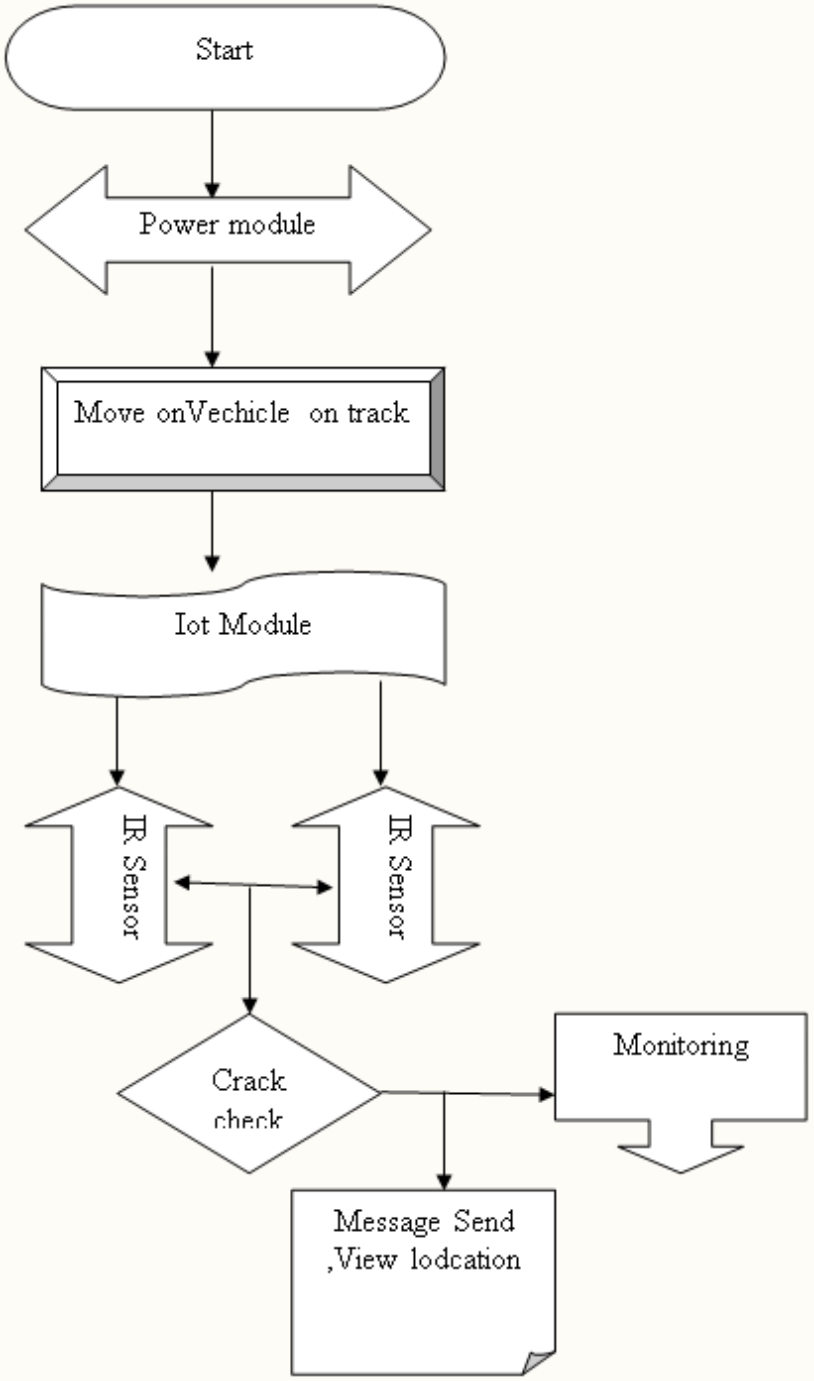
MODULES

- IR transmitter
- IR Receiver
- IoT Module
  - Wifi module
- Jumper wires
- Battery
- Android Mobile

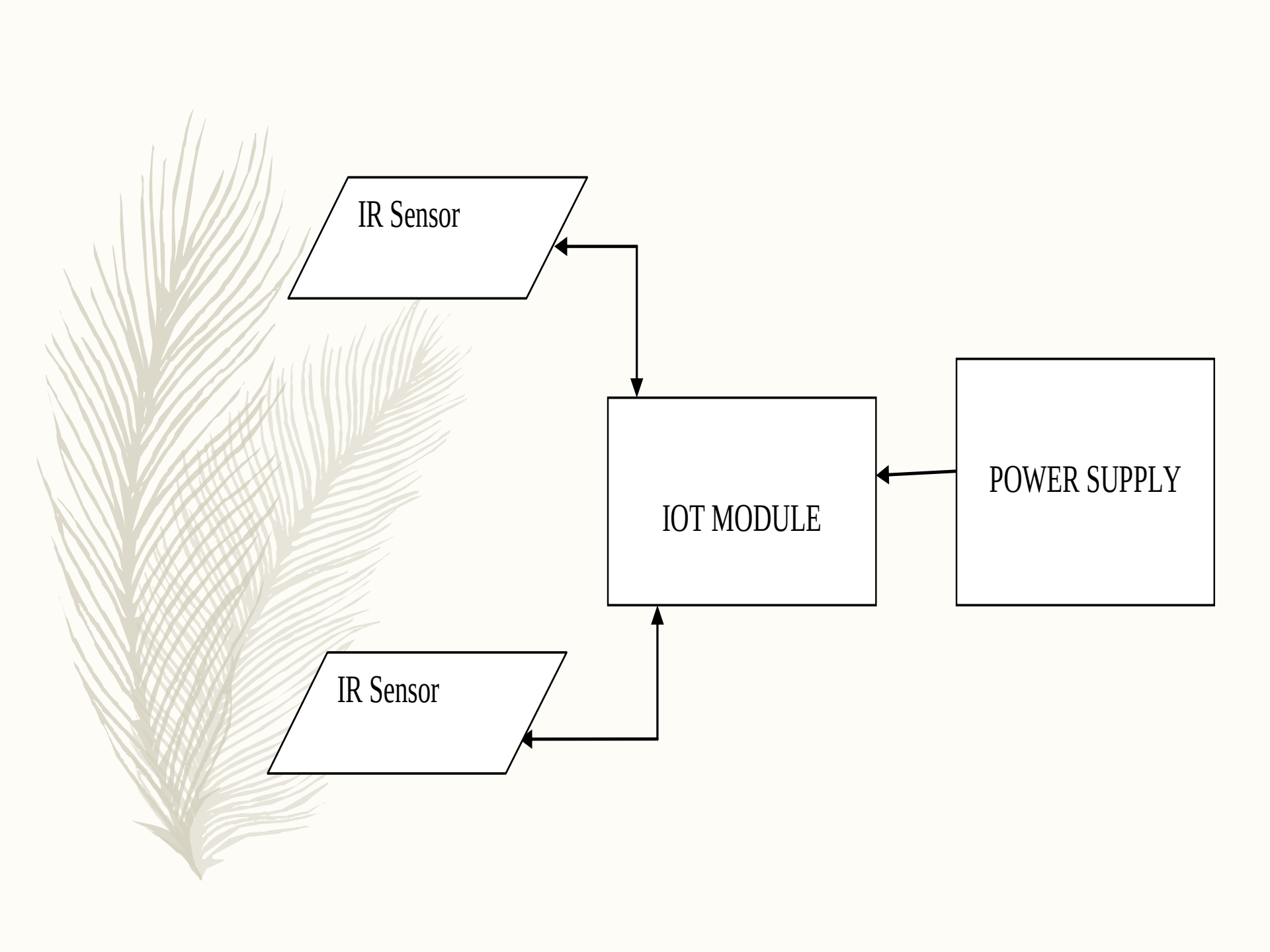
IoT Module

- It has 14 digital input/output pins
- In this module inbuilt wifi module is the special feature
- Comparing the Arduino the size of the IOT module is small
- This Smart IOT Device consumes less power and the compatability is high.
- This device consumes 5V DC power to operate and the size of this device is 1.5 inches to 2 inches only.
- It is Portable & effective to operate.

Logical Diagram


Start
Power module
Move onVechicle on track
Iot Module
IR Sensor
IR Sensor
Crack
Monitoring
Message Send
,View lodcation

Data Flow Diagram


IR Sensor
IOT MODULE
POWER SUPPLY
IR Sensor

Requirements

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HARDWARE

- IR transmitter
- IR Receiver
- IoT Module
  - Wifi module
- Jumper wires
- Battery
- Android Mobile

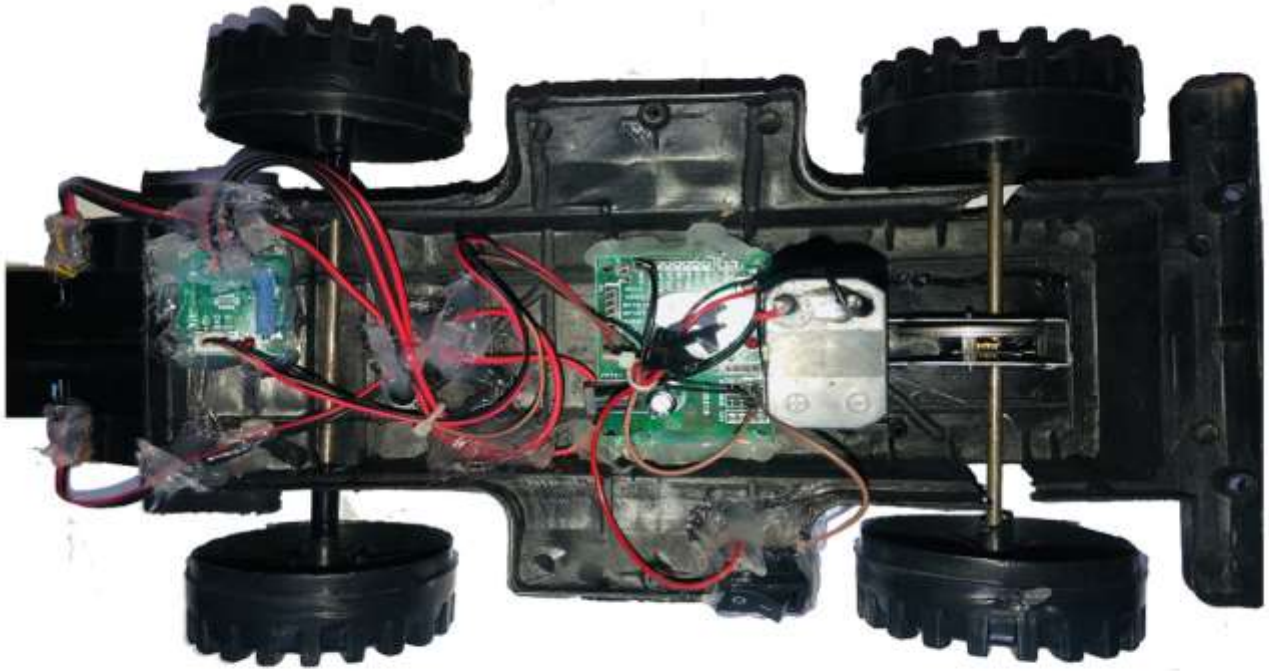
SOFTWARE

- Arduino IDE
  Language used - c++
- Android studio
  Language used - Java
- Notepad++
  Language used - php, Java script

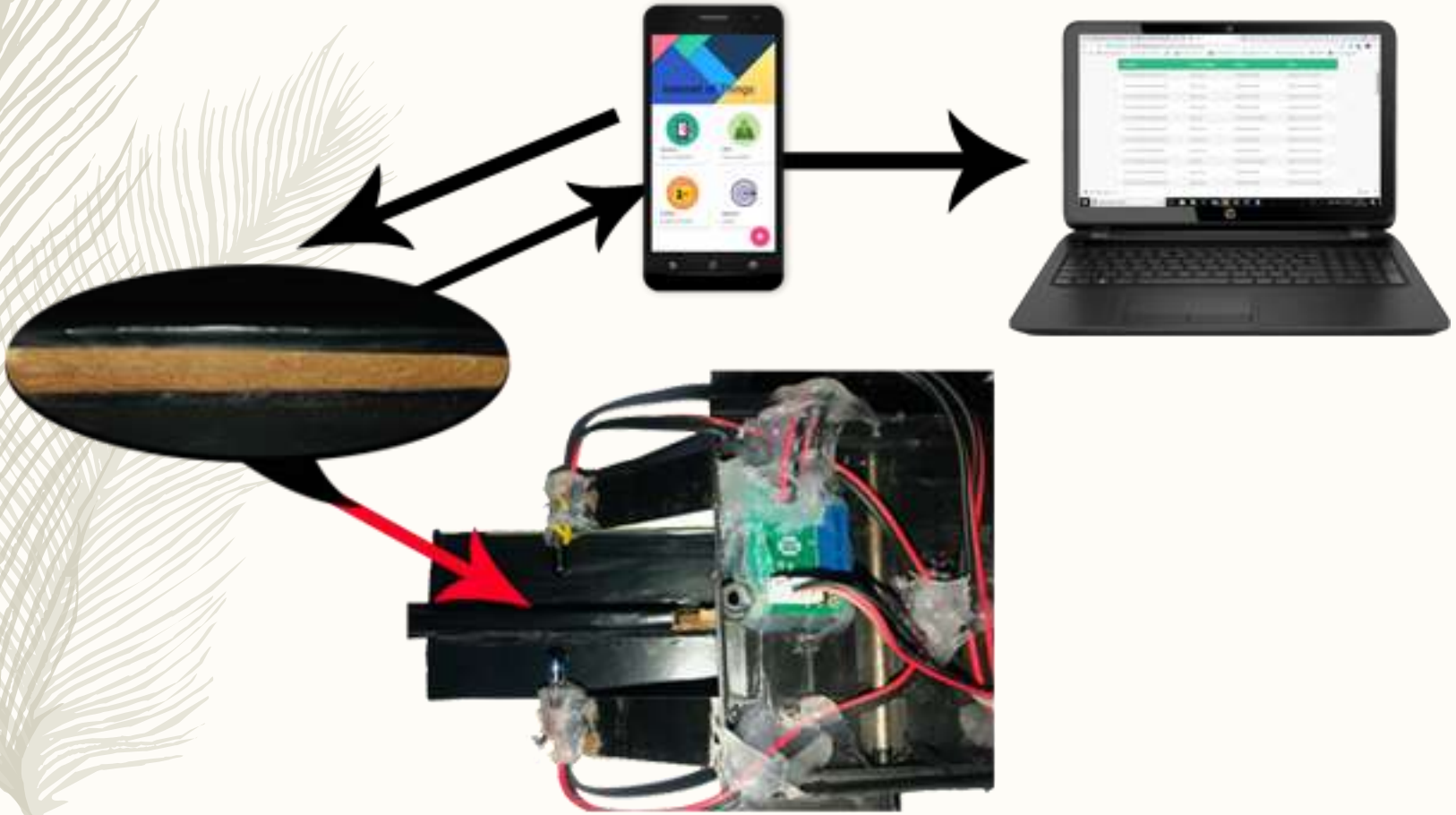
PHASE-1 (IOT DEVICE)

- Software used Arduino IDE
- Language used c++
- Hardware used
  - IR transmitter
  - IR Receiver
  - IoT Module
  - Jumper wires
  - Battery

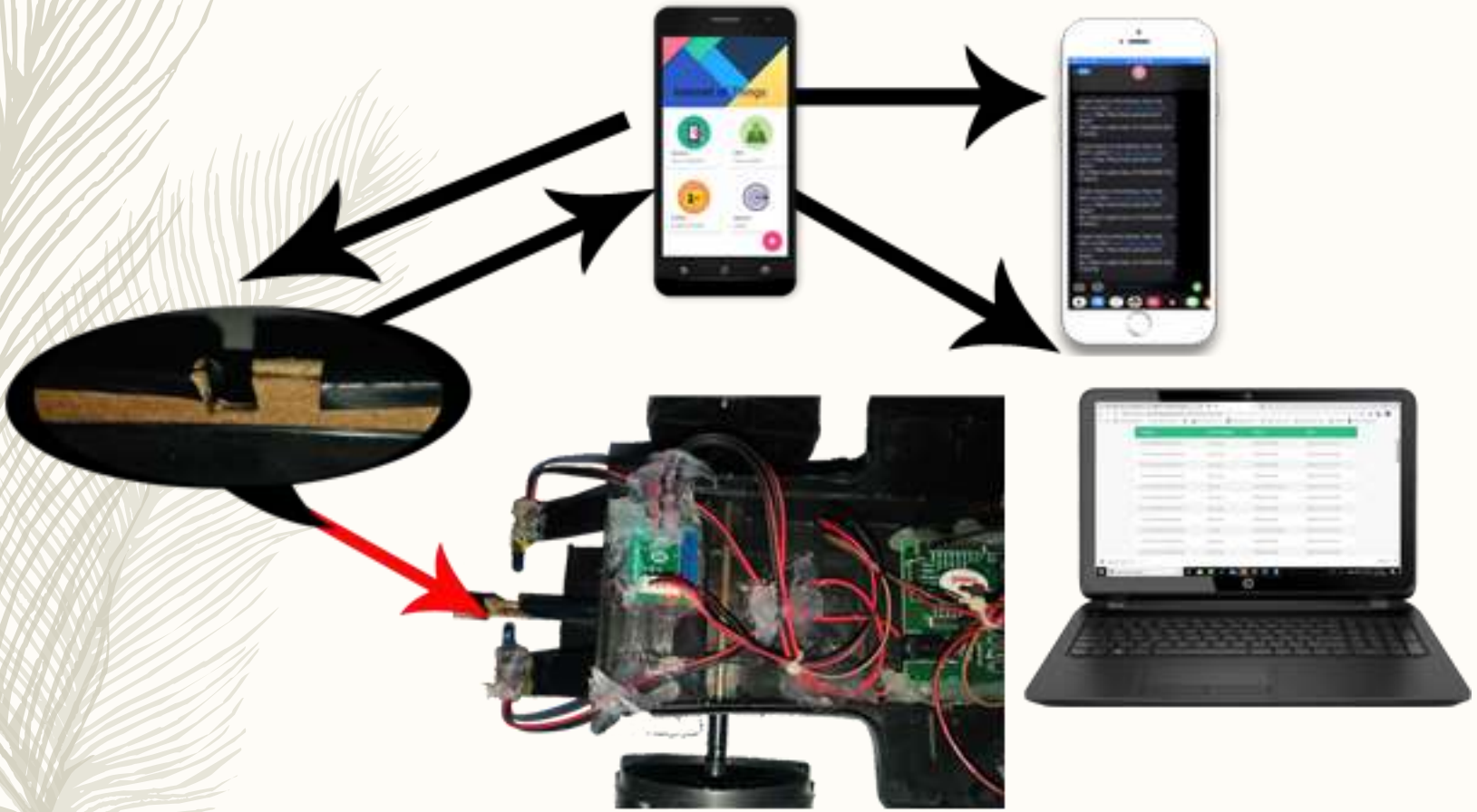
IOT DEVICE



AT NORMAL CONDITION



AT CRACK CONDITION



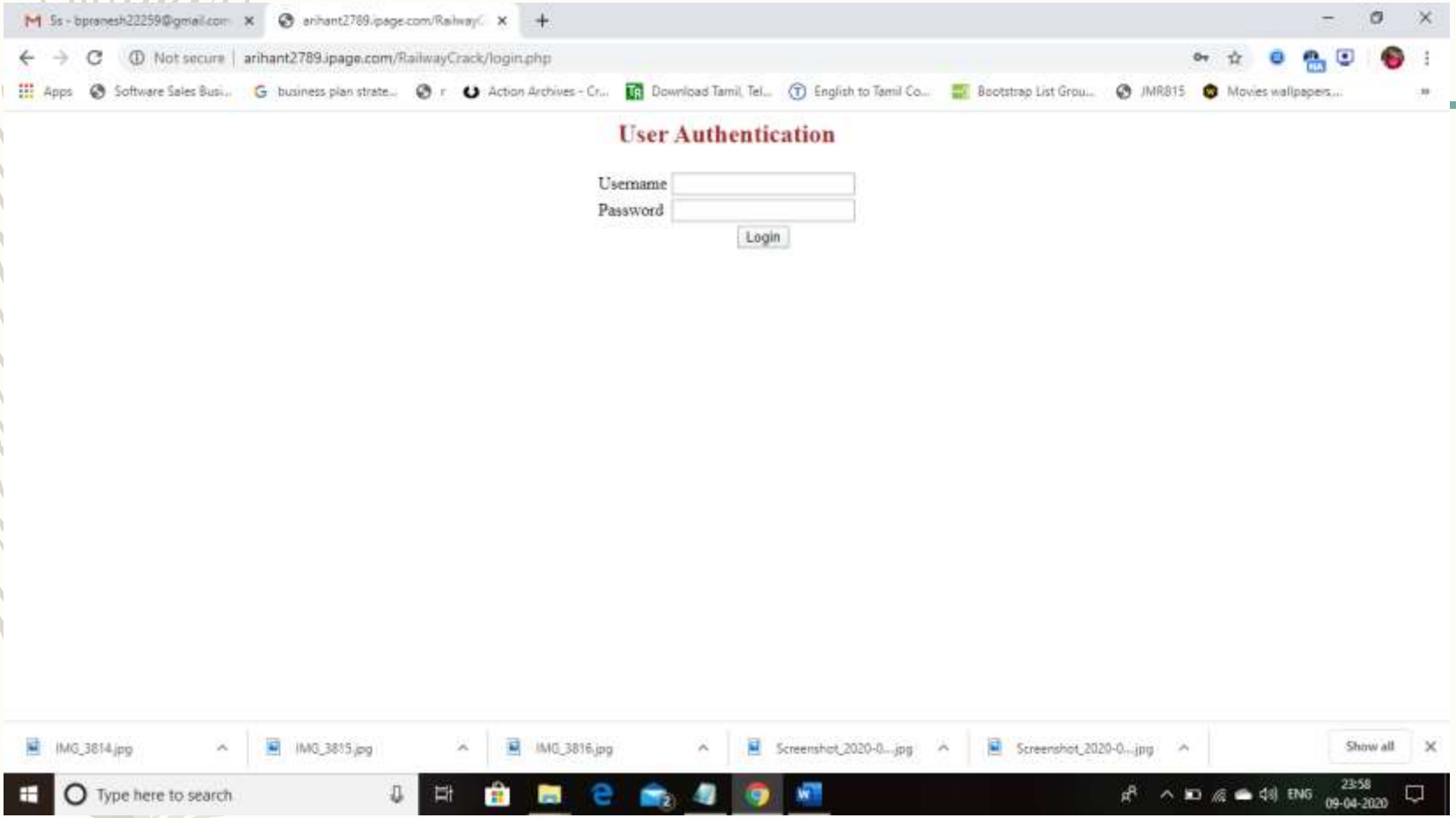
PHASE 2 (WEBSITE NOTIFICATION)

- Software use notepad++
- Language used Java script, Php.

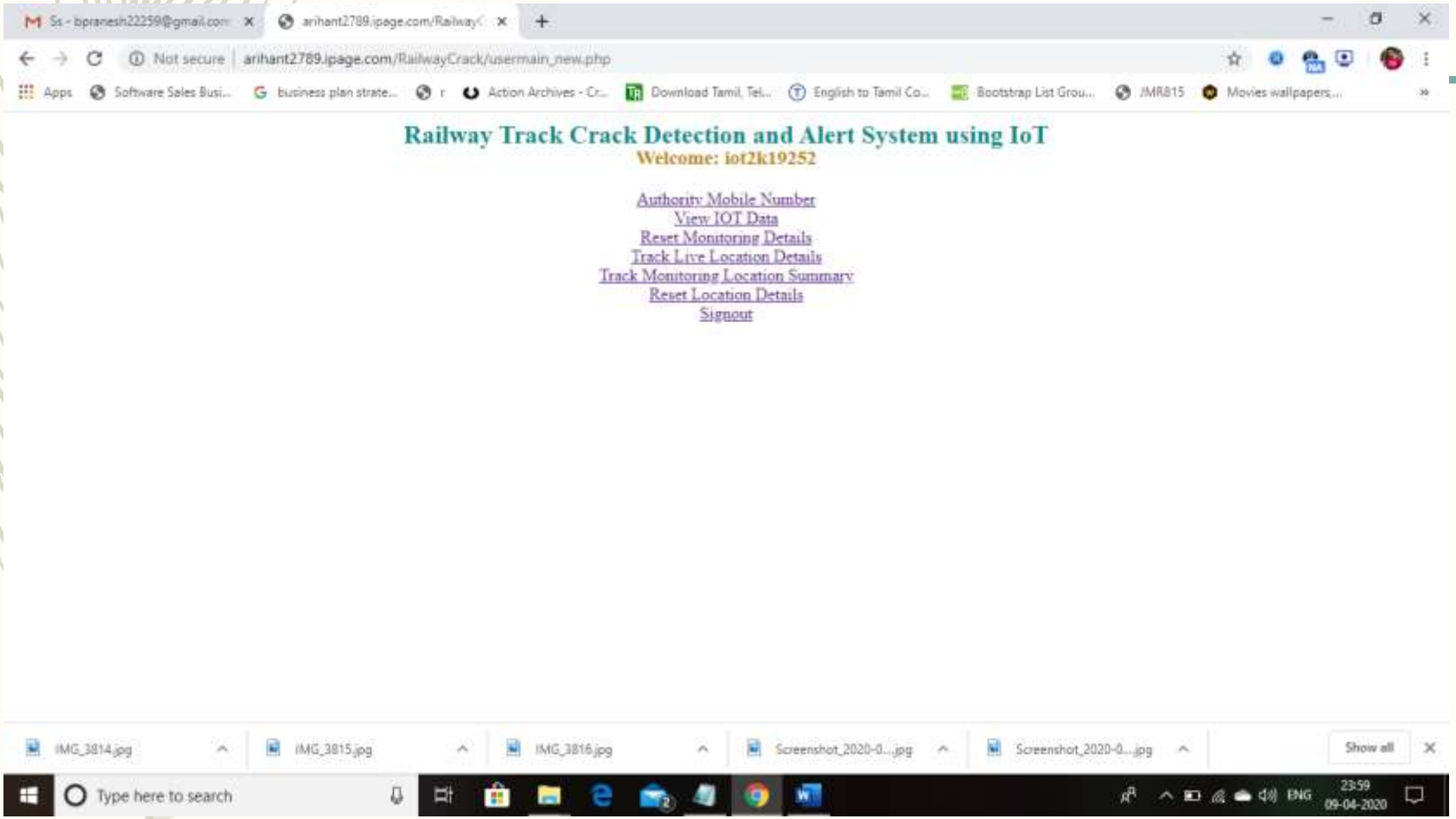
Website modules

- Login
- Authorized Mobile Number
- View IoT Data
- Reset Data
- Track Location Summary
- Track Location live Details
- Reset Track Location Summary
- Signout

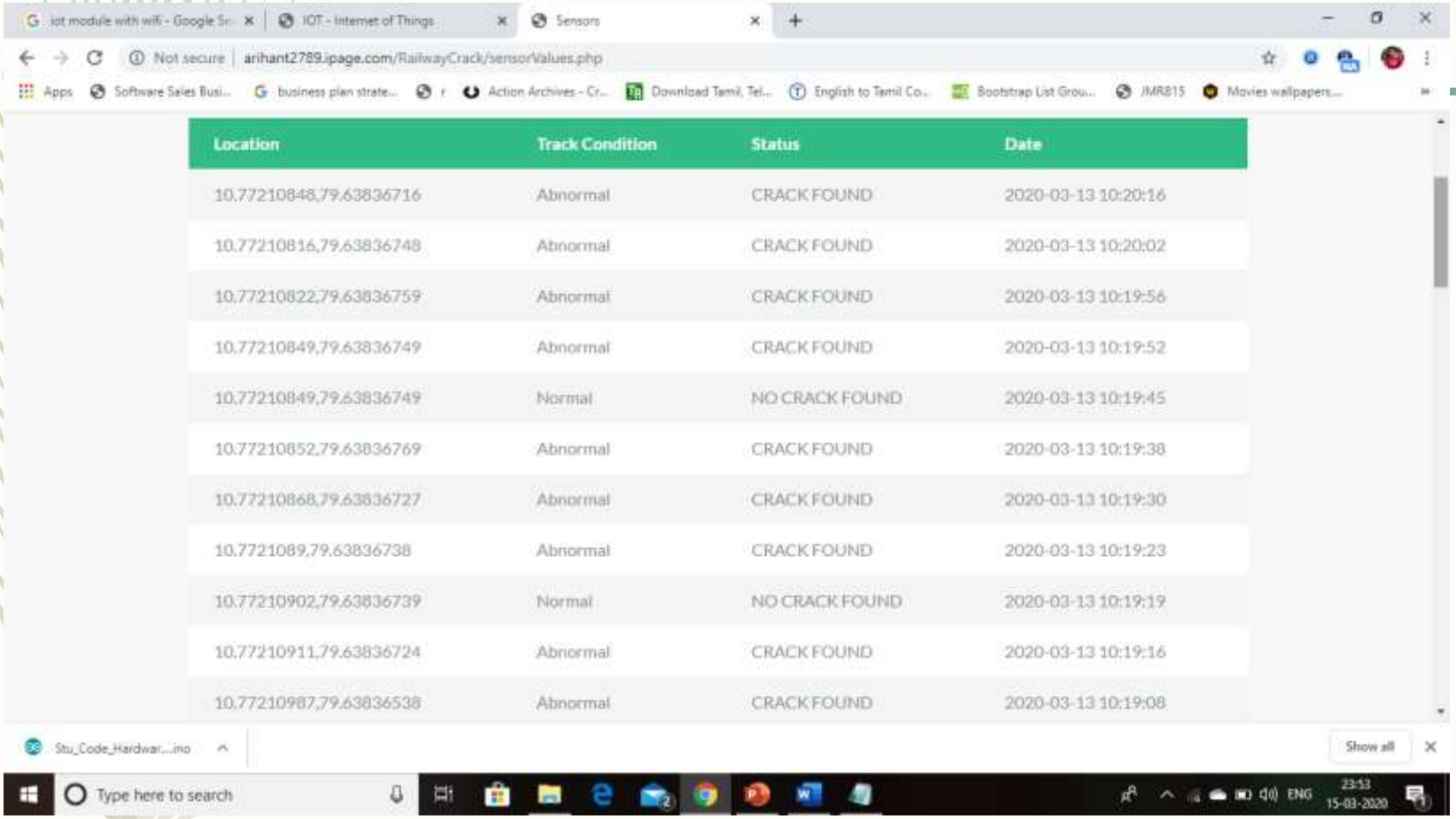
LOGIN


Not secure
arihant2789.ipage.com/RailwayCrack/login.php
User Authentication
Username
Password
Login
Type here to search

HOME PAGE


Railway Track Crack Detection and Alert System using IoT
Welcome: iot2k19252
Authority Mobile Number
View IOT Data
Reset Monitoring Details
Track Live Location Details
Track Monitoring Location Summary
Reset Location Details
Signout

CRACK DATA


iot module with wifi - Google Sr
IOT - Internet of Things
Sensors
Not secure
arihant2789.ipage.com/RailwayCrack/sensorValues.php
Apps
Software Sales Busi...
business plan strate...
Action Archives - Cr...
Download Tamil, Tel...
English to Tamil Co...
Bootstrap List Grou...
JMR815
Movies wallpapers...
Location
Track Condition
Status
Date
10.77210848,79.63836716
Abnormal
CRACK FOUND
2020-03-13 10:20:16
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CRACK FOUND
2020-03-13 10:20:02
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CRACK FOUND
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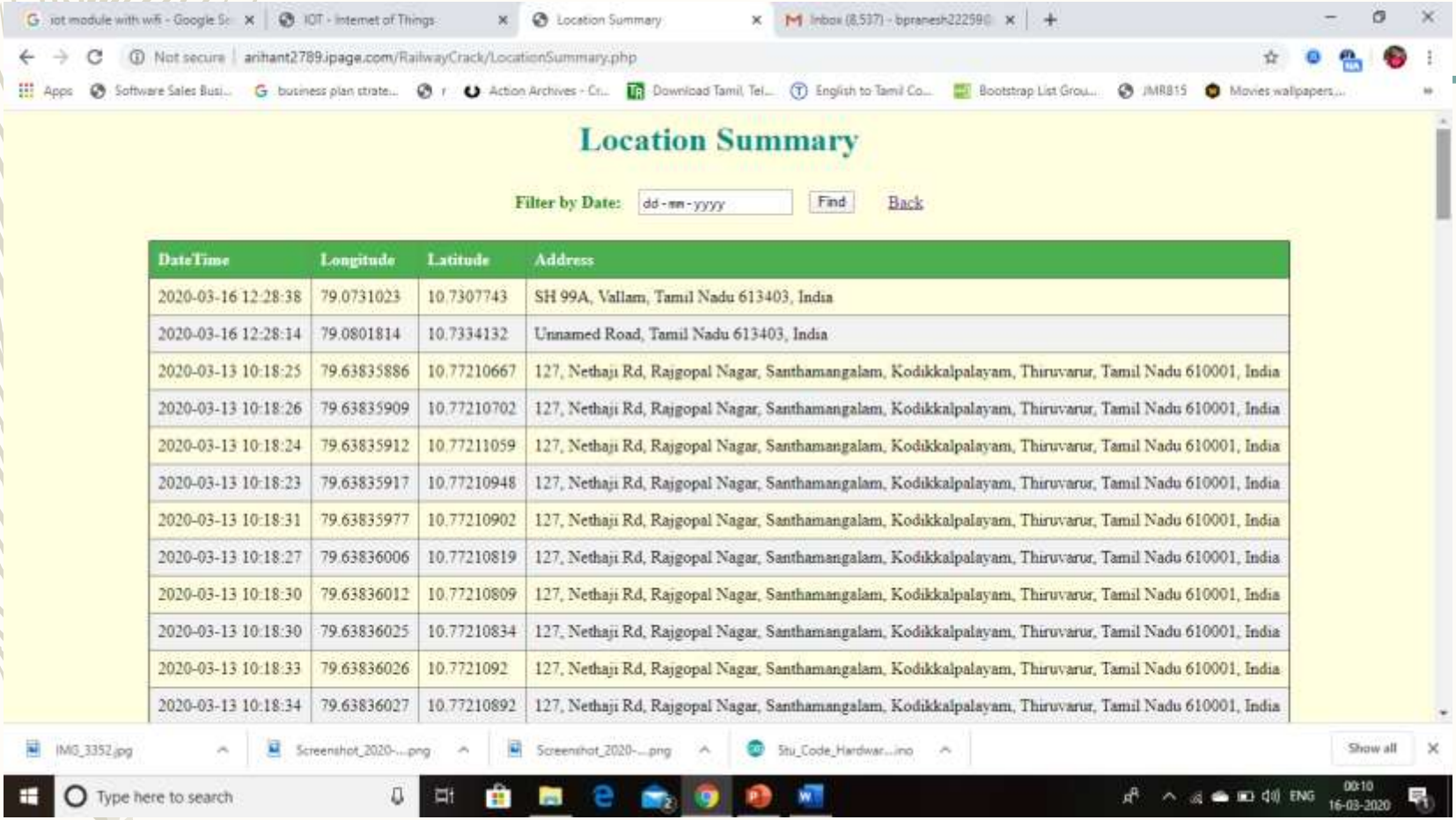
Abnormal
CRACK FOUND
2020-03-13 10:19:08
Stu_Code_Hardwar....ino
Show all
Type here to search
ENG
23:53
15-03-2020

CRACK LOCATION



PHASE 3 (ANDROID APP)

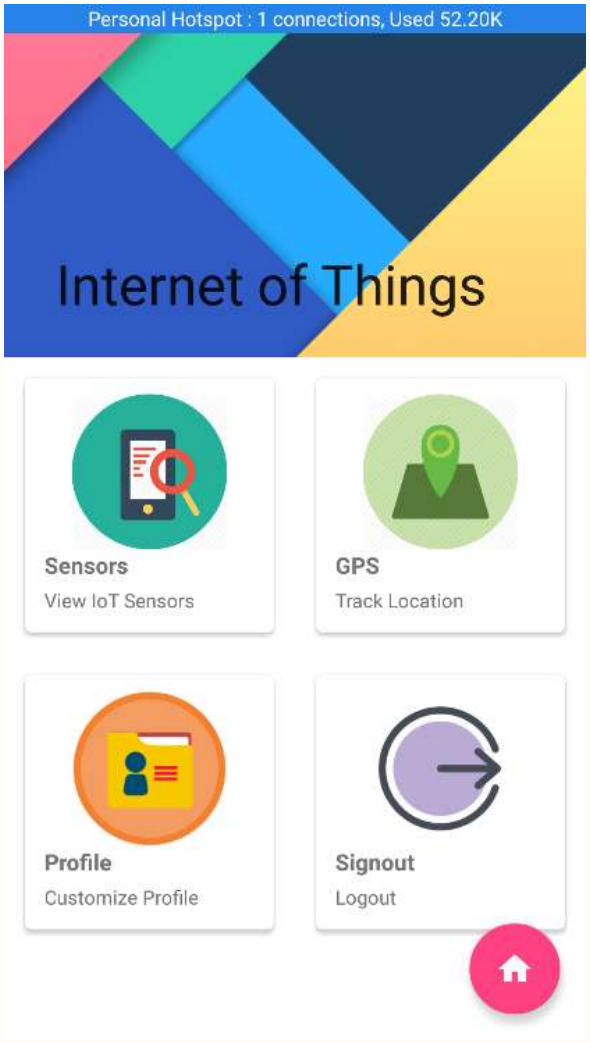
- Software used android studio
- Language used java
- Installed in any Android mobile

Android app modules

- Login
- Home display
- Sensor connection
- GPS
- Profile
- Sign out

LOGIN

HOME


Personal Hotspot : 1 connections, Used 52.20K
Internet of Things
Sensors
View IoT Sensors
GPS
Track Location
Profile
Customize Profile
Signout
Logout

PROFILE

Title: Railway Track Crack Detection and Alert System using IoT

Loads: null

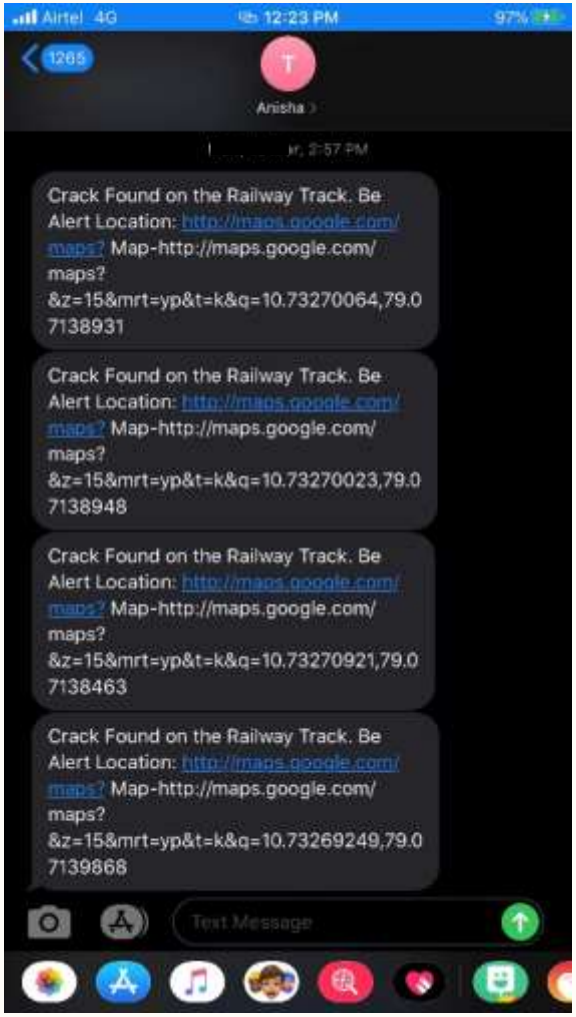
Sensors Used: 3

7708014143

LOCATION


12:10 PM
Location
Lat:10.7722912
Lon:79.6377539
37, Nethaji Rd, Rajgopal Nagar, Santhamangalam, Arch, Thiruvarur, Tamil Nadu 610001, India

MESSAGE RECEIVED TO THE AUTHORIZED MOBILE NUMBER



WORKING PRINCIPLE

- In this project, there are two set of IR sensor units fitted to the two sides of the vehicle. This unit is used to activate/deactivate GSM transmitter unit when there is any cracks in the track.

- The IR transmitter and IR receiver circuit is used to sense the cracks. It is fixed to the front sides of the vehicle with a suitable arrangement.

CONCLUSION

- In this project i have designed a cost effective, low-power embedded system, which facilitate better safety standards for rail tracks for preventing railway accidents due to cracks and obstacles on railway tracks.
- The Prototype of testing vehicle can efficiently detect cracks and obstacles on railway tracks.
- The result shows that this new innovative technology will increase the reliability of safety systems in railway transport
- By implementing these features in real time application, we can avoid accidents up to approximately 70%

THANK YOU