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Tracking of stolen motor vehicle using an Android Application

Dr. Ratnesh Litoriya
Jaypee University of Engineering & Technology, Guna (M.P.) India

Aditya Gaurav
Jaypee University of Engineering & Technology, Guna (M.P.) India

Adarsh Keshari
Jaypee University of Engineering & Technology, Guna (M.P.) India

Ajay Kumar
Jaypee University of Engineering & Technology, Guna (M.P.) India

Abstract

During the last several years vehicle theft had been prevalent in many countries world-wide. With the increase in need for vehicle security, there is now a strong need to develop new technology to stop vehicle theft. Of the measure being developed so far including those with GPS and GSM technology is very common and fails if the thief is too smart to take out the micro-controller from the car. But due high cost many of people in India are unable to install the micro-controller due high cost and less reliability. With the advancement of Traffic Surveillance Camera in most of the cities in India, we can now able to track vehicle through our smart phones. The idea is simple we just have to have vehicle numbers crossing Traffic signal saved and maintained by the government, already Andhra Pradesh government started using it for E-challan purpose. So the vehicle number of lost vehicle can be searched in the database, and tracked and informed to next possible traffic control locations. This short paper illustrates the idea of tracking stolen vehicles using an android application.

Keyword: Android, GSM, GPS, OCR

I. INTRODUCTION

In today's scenario stolen vehicles are very hard to track especially in India where GPS and GSM tracking is quite expensive and people does not afford to install micro-controller on their vehicles and pay monthly for tracking service providers. According to the survey of National Crime Records Bureau approx. 183,450 vehicle were found missing in 2014 and only 39192 vehicle are recovered i.e. only 21.4% recovered by police department[1]. Of the various measures for tracking we have device and easy and affordable way to track down one's

vehicle. We are familiar with the new E-Challan system introduced by government in some states[2]. Just by capturing image of all the number plates of the vehicle crossing the signal and extracting the numbers and saving in database can be useful in tracking stolen vehicles. Using government database for searching for the vehicle number of stolen vehicle provide next locations where the vehicle could travel next can help police and crime bureau to successfully track stolen or missing vehicles.

This system has OCR technology to extract text from the image i.e. the vehicle number and traffic surveillance camera ID to know the location of the area. With these two information stored on the database with the help of web scripting language we could able to track vehicle. Finally we use android technology to easily and portably track the vehicle by simply searching the vehicle to be tracked.

The system is user-friendly, easily installable and easily accessible for users using the android application. The application also suggests the next possible locations where the vehicle could be found.

II. RELATED WORK

[1] The OCR related working of the system is developed. The purpose of the development using Traffic Surveillance Camera number plate image is security as well as economy. The systems process, interface and data transmission is working fine and resulting texts are retrieved from the image successfully.

[2] This methodology of tracking vehicle is new and may take few years to implement. It contains few assumption related to images of the number plate and security of the number plate. The first assumption is, the images of the number plates of all the vehicle passing from a traffic signal is taken, the is extracted and stored in some database for a significant period of time. The second assumption is related to the number plate security, i.e. all the number plates are fully secured with alarmed system. These two assumptions are really important for the system to run successfully. Even though second one is not much of that importance as vehicle with no number plates can be suspect. But the first assumption is very important and is much more likely to be implemented in near future.

[3] The web application for retrieving text from the image and storing it on the server with related information is developed. The OCRAD.js successfully extract text from the image and through web script running in the background we are able to store the vehicle number and the location of the vehicle.

[4] The android application is developed with the user login and registration system. The database is maintained centrally on local server for the sake of convenience. The searching algorithm is applied for finding vehicle if found somewhere. Also, algorithm for auto suggestion system for tracking purpose is also developed.

III. SYSTEM ARCHITECTURE

The system consists of three modules as described below:

a. OCR API
b. Web Scripting
c. Android Application

The whole view the system looks like the below image.

A) OCR API

After capturing the image of the number plate of the vehicles there is the need to extract text from the image. This method of extraction is done by the Javascript API OCRAD.js[2]. Which extracts the number from the image and send it to next module for further processing.

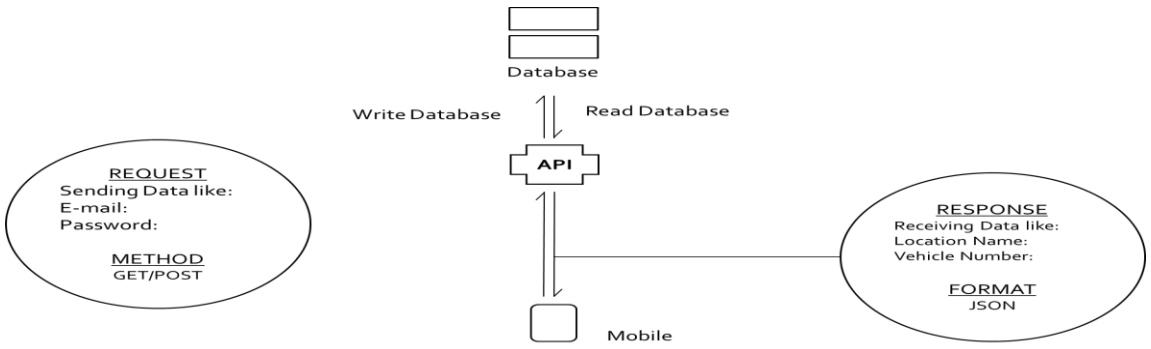

Fig. 3.1 System Architecture

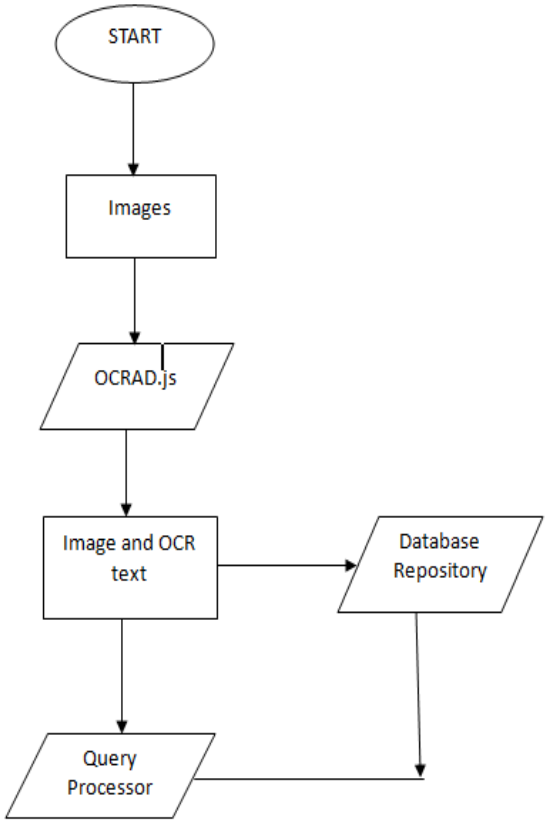

Figure 3.2Flow Diagram

B) Web Scripting

After the extraction of text from the image of the number plate the next step is to store the number in a database which is presumed to be maintained by the traffic department. This whole process is carried out through web scripting.

Tools and languages used:

- PHP language for web scripting.
- Database: MySQL
- WAMP Server.

C) Android Platform

Lastly Android Application is provided for finding the stolen vehicle. The android application use the data stored on the traffic department database server to notify the last location of the vehicle as well as suggest the next possible locations where the vehicle could be found. We use android phones because of its affordability and popularity so that everybody can use our services. The registration of vehicle and other information related to it is done through android platform only. The searching part is also performed through android application.

Tools and language Used:

- JAVA Android Library.
- Eclipse IDE.

IV. SOFTWARE PROGRAM

The software programming is mainly done using JAVA android library. Searching vehicle numbers from the database and corresponding location is performed on application behalf. Also auto-suggestions for the next possible locations is also performed through android programming. Though parts

including web scripting are done through PHP language and API is JavaScript based. But the main user end is the android application and hence major of the project work is done in Android Programming. The project also make use of certain android features such as SQLite database, JSON Parser, Http Request such as HttpPost etc.[4]

V. ANDROID APPLICATION

The android application is the main user end on which actually user interacts. The application first performs a login and registration system. People register their vehicle numbers, engine number and chassis number through the application portal. After Logging into the application people can track their vehicle by pressing track button which performs searching on user's behalf.

Then the corresponding location of where the vehicle is last seen and the time is displayed on the screen. The user is also provided with the auto-suggestion option which provide the next possible location the vehicle could be found.

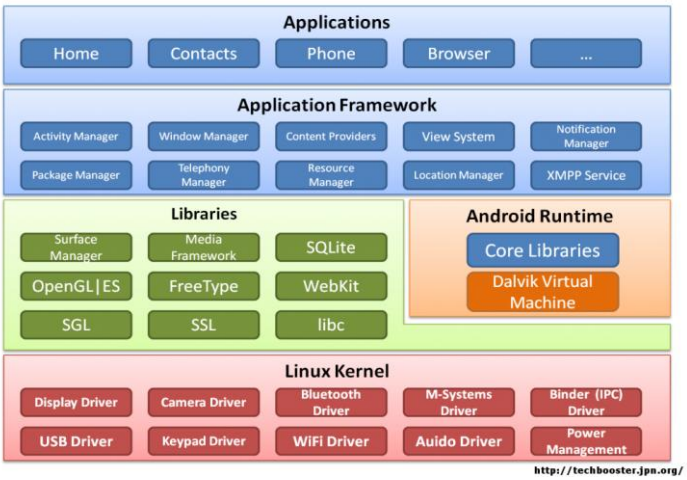

Fig. 4.1 Android Platform Architecture [6]

VI. FEATURES OF ANDROID APPLICATION

- The Application is user friendly which starts with login page.
- Provides last seen location i.e. traffic signal location of the vehicle.
- Auto-suggest next possible location or area within which vehicle could be found.

VII. CONCLUSION

The project discussed in this paper is about controlling auto-theft prevailing across the country. The main focus of the project was aspect of vehicle tracking economically as well as accessibility to the common people.

The simulation is done using localhost server in laptop and android phone accessing the data through internet permissibility.

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