Organization : MixORG people and ideas

bitwise

Problem Statement : Affordable Mobile Application Camera System to Monitor Residential Societies' Vehicle Activity

Create an affordable solution of a mobile application and a camera system through image processing to identify and monitor vehicles entering and leaving a residential society passing through the entry/exit gate.

Problem Code : CS1

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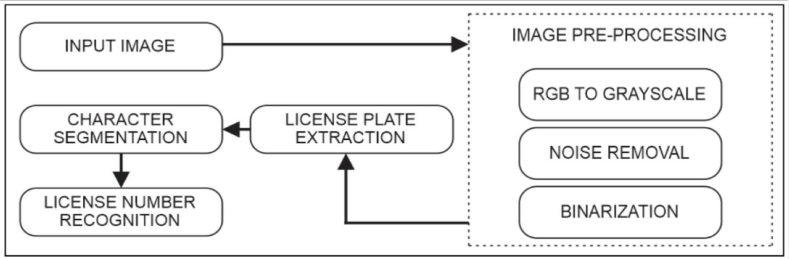
Solution

A mobile application which monitors residential societies' vehicle activity. There will be an **Admin Login (Secretary)** and **User Login**. User can add/delete vehicles accordingly, for himself/herself or guest which is approved by the Admin.
Whenever a vehicle enters/exits, an **LPR** (*License Plate Recognition*) **CCTV camera** captures the video of the vehicle which is converted into frames followed by conversion to images.



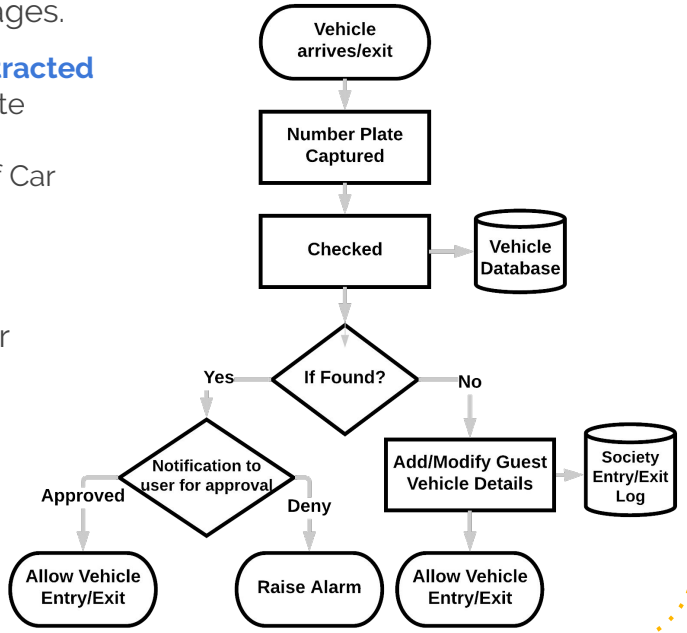
Information Extracted

- Number Plate
- Color
- Company of Car

Our System will identify the registration number from the number plate with the one registered and stored in the database.

Accordingly it will **authenticate** the vehicle, **sending a notification** to the appropriate user that car has arrived/left the society.

The user may approve/deny the entry/exit of the vehicle.
Similarly, the user can permit vehicles of guest arriving/departing.



Features

1. Improved security of the resident society.
2. Provide analytics to the security/management.
3. Monthly Bill Payment, Society notices, important local news etc.
4. Support for both English and Hindi.
5. Automate the process of guard shifts management.

Future Scope

1. Can be implemented in shopping complexes, corporate offices, universities etc.
2. Using RFID for vehicle identification.
3. **Robust** API for automatic parking system.
4. Entry/Exit Log made available to law enforcement agencies for identifying suspicious activities.

Revenue

Our Platform

1. Collecting and selling user vehicle data.
2. In-app Advertising.
3. Maintenance from society fund.

Society

1. Charges imposed on exceeding number of vehicles of registered user.
2. Collaborating with apps like ***Airbnb*** to acquire a share of their revenue as parking charges.

Technology Stack

Android Studio

Firebase

App Development S/W and Database

OpenCV

TESSERACT

Tensorflow

python Libraries

License Plate Number Recognition using OCR and Neural Network

paytm Integration

Payment SDK

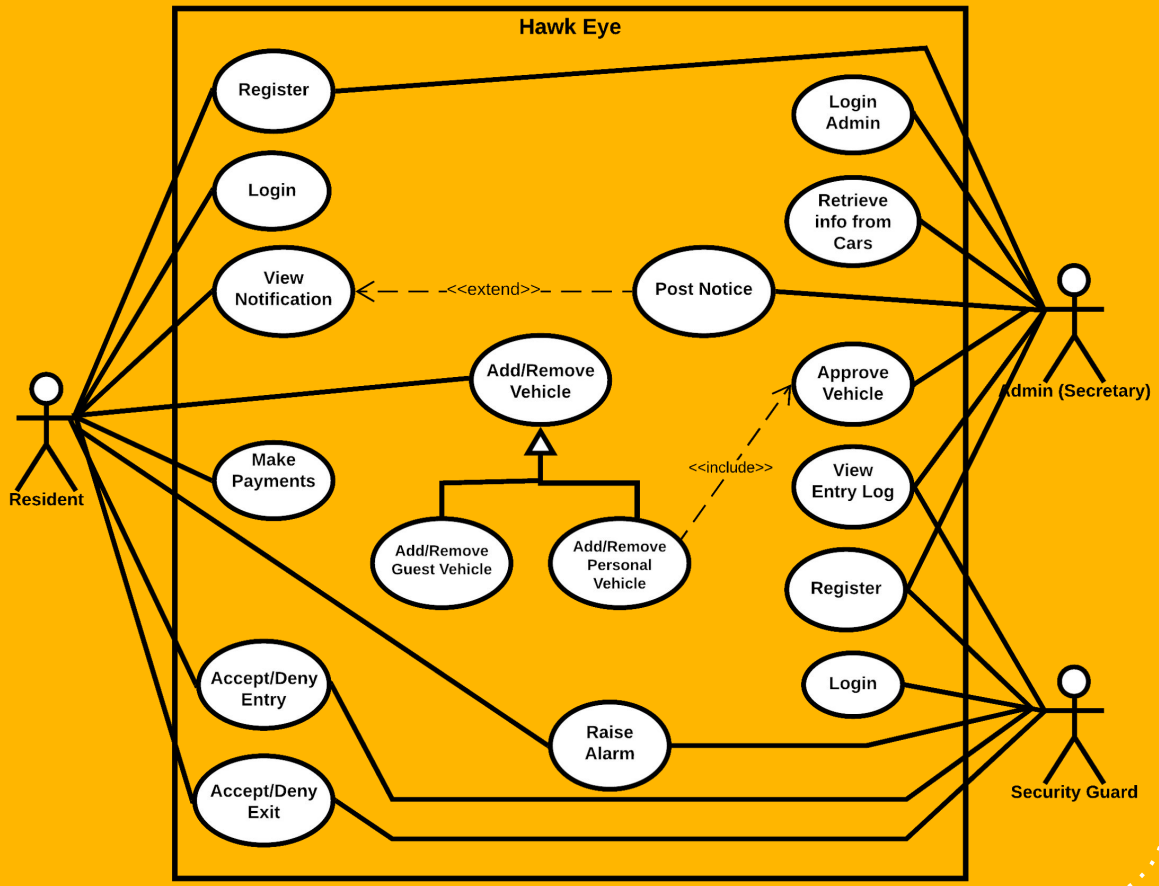
Use Case

Actors :

1. **Resident** of the apartment (Primary).
2. **Admin** : Secretary of the society (Secondary).
3. **Security Guard** (Secondary).

Important Use Cases :

1. **Resident** can Accept/Deny Entry/Exit of vehicle when notification is received.
2. **Resident** can add/remove personal vehicle (*to be approved by Admin)* and temporarily add guest vehicle.
3. **Secretary** can post notices, news on the platform.
4. **Secretary** can approve new registrations.
5. **Security Guard** can view automated entry/exit log.



Dependencies

Physical

1. Cooperation and acceptance by society.
2. Guards capable of reading and operating the application.

Software

1. Python Libraries- scikit,, scipy, numpy, matplotlib, Pillow, tensorflow.
2. Payment APIs
3. Accuracy of detection technologies to be used.
4. Database - Firebase

Hardware/Computing Services

1. CCTV Camera
2. Smartphone with internet connection.
3. Cloud Services for computations.