**Road Sign Recognition System for Autonomous Vehicle using Raspberry Pi**

**Alternate Title:** Unregistered Vehicle recognition based on Number plate using Raspberry Pi

**Aim:**

Aim of the project is to build an intelligent surveillance system for automated unregistered vehicles recognition by number plate detection and recognition.

**Introduction:**

The automated object detection algorithm is really important component in the smart cities application. In urban surveillance application the image sensor / camera plays an important role in digitizing the scene or environment. To process the digitized images searching for a particular object, smart vehicle license plate is a huge task as it will need a high CPU and memory power. To achieve this kind of functionality with distributing the processing is best way to solve. The Image processing technology to search for a number plate in a given image frame is an important task.

In this project we are using Raspberry pi as a processing unit to detect the number plates in traffic signals. USB camera is attached with raspberry pi, it detects number plates of every vehicle and extracts the numbers using OCR algorithm. Extracted vehicle numbers are compared with existing database, if the number of vehicle is not in registered list it send the number and image of vehicle to the control station through mail. Using this system, we can prevent illegal activities using unregistered or fake numbered vehicles. It is a low cost and efficient surveillance system when compared to present systems are used.

**Existing System:**

Existing system classifies road signs for automated vehicle control. It uses cascade classifier to classify the road signs in roadside. It can label the name of road sign in live video. This system cannot give high accuracy in dynamic environments.

**Proposed System:**

This system proposes a compact and portable model to recognize the number plate of the vehicle. It will extract the numbers from the detected number plates using OCR algorithm and compare the extracted numbers with existing database which contains all registered vehicle numbers.

**Block Diagram:**

Camera



Number Extraction

fgfg

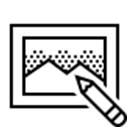
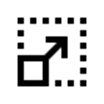
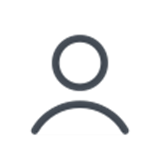
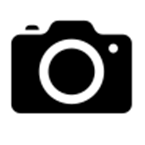


Image processing



Feature Extraction



User

Identified Number

Number Plate Detection

Data Base

**Block Diagram Description:**

In this block diagram, Raspberry Pi is connected with camera. Camera captures the all frames continuously. Once the image is read in python the image is converted to grey scale image. This means the pixel value will be stripped off the color values and converted to the grayscale. The grayscale image is then processed to find out possible number plate area using edge detection technique. After edge detection, all high intensity pixels were scanned from left to right in the X axis and top to bottom for Y axis. The concentration of white pixels will give a fair knowledge of where the more number of edges were available in x-axis. This will give the approximate starting location of x-axis. Concentration of white pixels in y-axis is also scanned to get the approximate location of the y-axis. Due to the variable text or images available in the vehicle, we may have more than one region of interest of the number plate. The region of interest for the number plate area was detected from the previous module. We will try to fit the number plate area and ratio of width and height. If the possible number plates region is identified, the image is cropped for the dimension of the detected number plate. The number plate image is then processed with simple optical character recognition software to convert to a text. The extracted text is compared with existing database content. If the number is not in the database it will send the image and number of vehicle to the control station.

**Requirements:**

**Hardware Requirements:**

* Raspberry Pi 3
* USB Camera

**Software Requirements:**

* Language : Embedded ‘C’, Embedded ‘C++’,Python
* Compiler : GCC Complier.
* OS : Linux