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NUMBER PLATE DEDECTION

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Abstract

Automatic Number Plate Recognition (ANPR) is an image processing technology which uses number (license) plate to identify the vehicle. The objective is to design an efficient automatic authorized vehicle identification system by using the vehicle number plate. The system is implemented on the entrance for security control of a highly restricted area like military zones or area around top government offices e.g. Parliament, Supreme Court etc. The developed system first detects the vehicle and then captures the vehicle image. Vehicle number plate region is extracted using the image segmentation in an image. Optical character recognition technique is used for the character recognition. This can help the society to over come the problem of un organized travel in the road .

Keywords : *ANPR VEHICLE NUMBER PLATE, Vehicle identification System,*

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INTRODUCTION:

The number plate detection project aims to develop an algorithm that can detect the presence of a license plate in an image or video frame, segment the plate from the background, and recognize the alphanumeric characters on the plate. The proposed solution involves the use of various image processing techniques such as edge detection, morphological operations, and character recognition. The project's success depends on the accuracy and efficiency of the algorithm, which can be improved through the use of advanced machine learning techniques and data augmentation.

License plate detection and recognition has become an increasingly important area of research in computer vision and image processing. It has wide-ranging applications, such as law enforcement, traffic control, parking management, and toll collection. The primary objective of license plate detection and recognition isto automate the process of license plate identification, which reduces the need for human intervention and improves the accuracy of the process

NEED OF THE STUDY:

The Automatic Number Plate Recognition (ANPR) was invented in 1976 at the Police Scientific DevelopmentBranch in the UK. However, it gained much interest during the last decade along with the improvement of digital cameraand the increase in computational capacity. It is simply the ability to automatically extract and recognition a vehicle number plate's characters from an image. In essence it consists of a camera or frame grabber that has the capability to grab an image, find the location of the number in the image and then extract the characters for character recognition tool to translate the pixels into numerically readable character.

It can also be used to detect and prevent a wide range of criminal activities and for security control of a highly restricted areas like military zones or area around top government offices. The system is computationally inexpensive compare to the other ANPR systems Number plate detection (NPD) is one such innovative mechanism that identifies a specific part on the vehicle license plate and understands the characters using advanced technologies. It is one of the key functions of intelligent transportation systems.

Known as Registration Plate Recognition (RPR), or License Plate Recognition (LPR), the latest system of Vehicle Number Plate Recognition (NPR) uses AI, ML, deep learning, and computer vision-powered approaches to read such license plates on vehicles without human interaction.

This advanced system of number plate identification captures an image from a moving vehicle, searches for a number plate, and extracts relevant alphanumerics with the aid of the optical character recognition (OCR) mechanism. It translates the characters into readable digital text, which can be used for various applications such as preventing car theft, automated toll tax collection, traffic control, etc.

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STATEMENT OF THE PROBLEM

It Has inefficient to recognize the number plate of ever vehicle as a human and it is more complex operations to make this process.

OBJECTIVES OF THE STUDY

1. The main objective is to Improve their Efficiency, Productivity and Profitability.
2. The web Application provides a full, end-to-end management platform for in the transportation industry.
3. Automatic Number Plate Recognition (ANPR) is a mass surveillance system that captures the image of vehicles and recognizes their license number. ANPR can be assisted in the detectionof stolen vehicles.
4. The detection of stolen vehicles can be done in an efficient manner by using the ANPRsystems located in the highways.
5. This paper presents a recognition method in which the vehicle plate image is obtained by thedigital cameras and the image is processed to get the number plate information. A rear imageof a vehicle is captured and processed using algorithms
6. The main and the most important portion of this system is the software model. The software model use series of image processing techniques which are implemented in MATLAB 7.0.1

ASSUMPTIONS

Number Plate Management do help in Organizing the activity of fleets and most ofthem provides aclear and comprehensive set of rules for everyone.

MATERIALS & METHODS

Developing a Smart Crop Protection System from Animals, some steps need to befollowed to achieve this successful task.

The steps are definable as follows:

- Data
- Platform selection
- Configuration
- Data migration
- User training
- Testing

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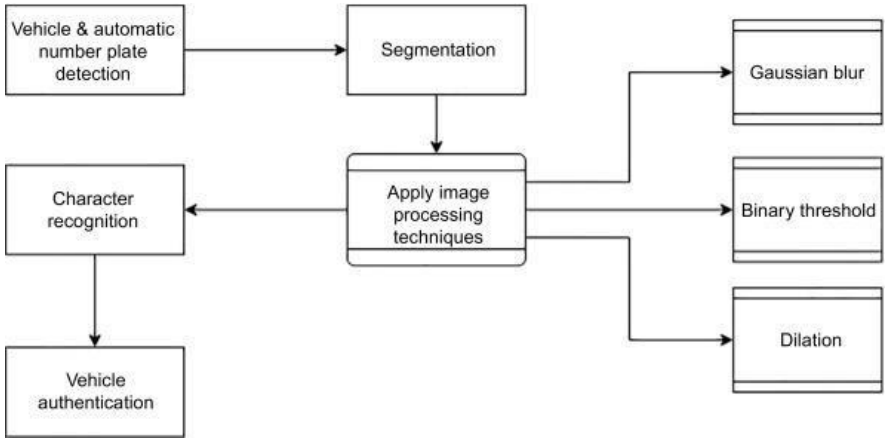
- Launch
- Maintenance
- Alert generation

BLOCK DIAGRAM:



HARDWARE REQUIREMENT:

- 8 MB RAM
- 120 GB Hard Disk Space
- Web camera.

SOFTWARE REQUIREMENT:

- PYCHARM
- PYTHON 3.0.8

MODULES:

1. Hear Cascade Classifier
2. YOLO
3. Faster -RCNN
4. SSD (Single Shot Detector)
5. User training
6. Mask R-CNN

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Haar Cascade Classifier: This model uses machine learning algorithms to detect objects in an image. It can be used to detect license plates by training the classifier on a dataset of license plate images.

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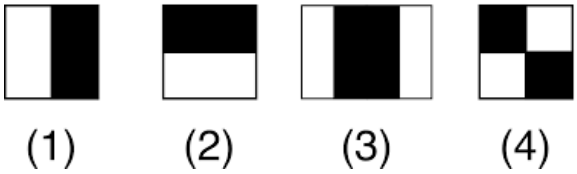

YOLO (You Only Look Once): This is a popular object detection model that uses a single neural network to detect objects in an image. It can be used for license plate detection by trainingthe network on a dataset of license plate images.

Earlier detection frameworks, looked at different parts of the image multiple times at different scales and repurposed image classification technique to detect objects. This approach is slow and inefficient.YOLO takes entirely different approach. It looks at the entire image only once and goes through the network once and detects

1. objects. Hence the name. It is very fast. That's the reason it has got so popular.There are other popular objectdetection frameworks like **Faster R-CNN** and **SSD** that are also widely used.

Faster R-CNN (Region-based Convolutional Neural Network) : This model is a popular choice for object detection and can be used for license plate detection. It uses a combination of deep convolutional neural networks and region proposal networks to detect objects in an image.

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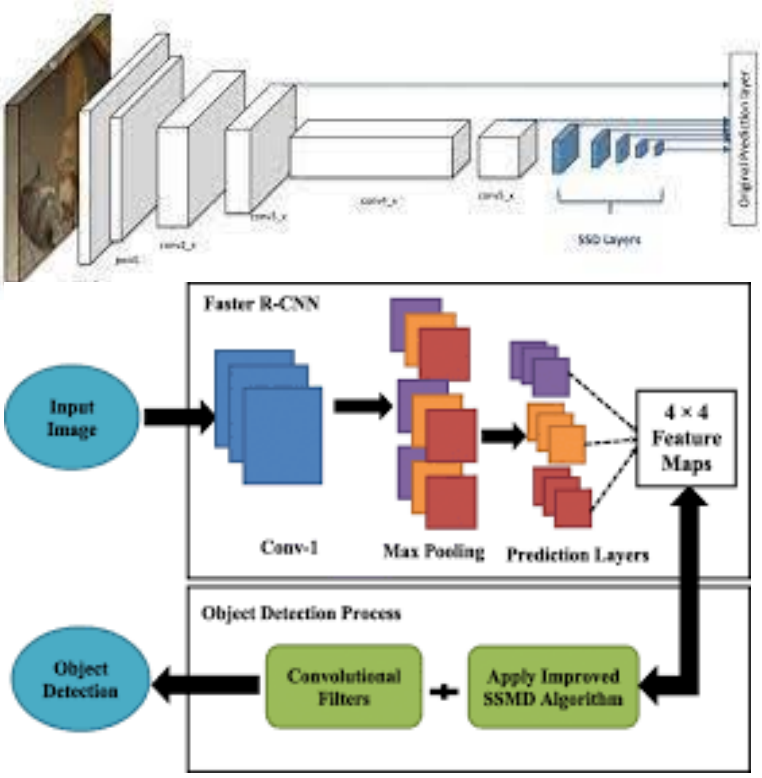
Mask R-CNN: This is an extension of Faster R-CNN that can perform both object detection and segmentation. It can be used to segment the license plate from the background and detect the characters onthe plate.

SSD (Single Shot Detector: This model is similar to Faster R-CNN, but it is faster and can be used in real-time applications. It uses a single neural network to detect objects in an image.

SD has two components: a backbone model and SSD head. Backbone model usually is a pre- trained image classification network as a feature extractor. This is typically a network like ResNet trained on ImageNet from which the final fully connected classification layer has been removed.Fiservices.



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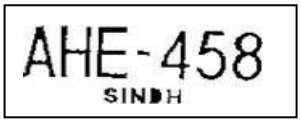

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CONCLUSION:

In this paper, the automatic vehicle identification system using vehicle license plate ispresented. The system useseries of image processing techniques for identifying the vehicle from the database stored in the PC. The system is implemented in Matlab and it performance is tested on real images. The simulation results shows that the system robustly detect and recognize the vehicle using license plate against different lightening conditions and can be implemented on theentrance of a highly restricted areas

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