Fancy Number Plate Detection and RTO Penalty Using Image Processing

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Abstract: The Identification of Indian vehicles by their number plates is a very challenging research topic for the past few years. The number plate recognition function is used to identify the model and shape of the vehicle number plate. The license plate contains information about the Vehicles trajectory and the vehicle's unique identification. The license number plate is used for various purposes like tracking of number plates by traffic police, for the analysis of theft cars, parking management of vehicles and collection of toll, etc. Optical character recognition is the technique that is used for number plate character recognition. As technology is getting advanced by the day, for each country there are many different aspects of designing the number plate of the vehicle. Fancy Number Plate Recognition is a system designed to help in the recognition of number plates of vehicles and identifies the Registration Number Formats set by the RTO and the Government. We capture the image of the vehicle's number plate and process the image to check the number plate is fancy or not. If Fancy Number Plate Detected then send Complaint to the RTO Section. There are also different ranges for reducing criminal activity like stolen vehicles, the black market of vehicles, illegal number plate style as well as the system will be implemented on the entrance of security control of a highly restricted area.

Keywords: Fancy Numbers, Number Plate Recognition, Image Processing, Segmentation

INTRODUCTION

Fancy Number Plate Recognition (FNPR)is an image processing technology which uses efficient algorithms to detect the vehicle number from real time images. The objective is to design an efficient Fancy Number Plate Recognition System and implement it for register complaints of the vehicles which having Fancy Number Plates. The system detects the vehicle first and then captures the image of the front view of the vehicle. Vehicle number plate is localized characters are segmented. The system is designed for gray-scale images so it detects the number plate regardless of its color. Template matching technique is used for character recognition. The resulting vehicle number is then compared with the available database of all the vehicles so as to come up with information about the vehicle type to charge toll tax accordingly. The system is then allowed to open road barrier for the vehicle generate toll tax receipt. The vehicle information (such as passing time, date, toll amount) is also stored in the database to maintain the record. The hardware software integrated system is implemented a working prototype model is developed. Experiments show that system successfully detects and recognize the vehicle number plate of real images of vehicles. Fancy Number Plate Recognition System (FNPR)also known as Automatic Number Plate Recognition (ANPR) was invented in 1976. Many scientist groups took interest in VNR after 1990s with the development of digital camera and the increase in processing speed. VNR is an image processing technology which enables to extract vehicle license number form digital images. It consists of a still or video camera which takes the image of vehicle, find the location of the number in the image and then segments the characters by using the template matching scheme, it translates the license number of pixel value into numerical or string. VNR can be used in many areas from speed enforcement and motorways to automation of parking lots, etc [1].It can also be used on highways motorways to automate the toll tax collections. The system proposed through this work is efficient for automatic toll tax collection using Fancy Number Plate Recognition System System The earlier methods use plate color information which can detect only single color number plates or use specific color search algorithm which is computationally expensive or use artificial neural network which involves complex mathematics [2][3][4]. The proposed VNR system is efficient color independent so that it can run real time using normal desktop PC and can recognize various standard number plates such as Transport Vehicles (Yellow), Non-Transport Vehicles (Green and white) and Electric Vehicles(Green) under acceptable lighting conditions.

MOTIVATION

Keeping up with the records in a succeed document and register doesn't ensure the accessibility of information. Since, assuming that the framework crashes or goes disconnected because of force disappointment and normal catastrophes, we will not have the option to bring the essential data. Our point is to make an advanced Fancy Number Plate Identification framework that will be less tedious and robotized observing and control of vehicle passage exit at the door utilizing a picture handling framework.

LITRATURE SURVEY

In literature survey we learn guides or helps the researcher to define/find out/identify a problem. It is something when you look at a literature in a surface level, or an Aerial View. It includes the survey of place people and publications is context of research.

• Automatic number plate recognition (ANPR) is a real time embedded system which automatically recognizes the license number of vehicles. In this paper, the task of recognizing number plate for Indian conditions is considered, where number plate standards

are rarely followed. The system consists of integration of algorithms like: 'feature-based number plate localization' for locating the number plate, 'image scissoring' for character segmentation and statistical feature extraction for character recognition; which are specifically designed for Indian number plates. The system can recognize single and double line number plates under widely varying illumination conditions with a success rate of about 82%.

• Nowadays, an automatic number plate recognition (ANPR) system is a key aspect in traffic congestion. This will help to minimize the different kind of violations on the road. Advanced systems for tracking and identifying stolen, unauthorized vehicles are based on automated number plate recognition technology. This paper's main objectives are to review other methods and propose our own algorithm. A short review is performed on the various methods of number plate recognition algorithms. Further explanations of the proposed algorithm are illustrated in graphical forms to show how the algorithm works. This paper concluded with tests and evaluation results.

• Auto Recognition of License Plate is a kind of image processing technology for recognizing the number plate information from images or videos. The observed plate images are normally in low resolution and suffer severe loss of edge data, which cast, incredible test to existing vehicle number plate detection and recognition patterns. The process of Auto recognition of License plate requires a high level of precision, when there are various vehicles going in a brief span and number plate abstraction is a number is a difficult task, basically because of number arrangement, and impact of environmental work. This step influences the accuracy of character separation and acknowledgment framework. This paper introduces a algorithm for Auto recognition of license plate system utilizing various approaches. Auto recognition of license plate method comprises of three segments: Character segmentation, Optical character recognition and template matching. The proposed framework presents the automatic vehicle number plate identification system utilizing a vehicle number plate extraction. Another strategy utilizing Gabor filtering for character recognition in gray scale image is proposed in this paper. Components are separated directly from gray-scale character images by Gabor filters which are exceptionally intended for measurable data of character structures. Template matching is a system which is exploited to find a sub image of an target image which coordinates a template image. Experiment result outcomes to show the superiority of our proposed approach as far as effectiveness.

The main objective of the system is to monitor the vehicles that are entering and going out of the organization. All vehicles have their own unique license plate number, so the abstraction of plate number plays a major role in this system. The vehicle number plate is taken by the tool like camera which is placed at the entrance. The captured image is then processed by the Automatic Number Plate Recognition (ANPR), an image processing algorithm. ANPR method is an efficient way of recognizing the vehicle numberplate and strengthen the security system. A database is created with the vehicle number which belongs to that particular organization. The recognized number plate is then compared with the database and checks whether the vehicle belongs to the organization if not then it is an unknown vehicle. Then the entry and exit time of the organization vehicles are recorded. In case of centralized receiver all the entrance records are kept in storage and any unfamiliar vehicle entering into the organization is noticed and central controller monitor the details

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. The resulting data is then used to compare with the records on a database so as to come up with the specific information like the vehicle owner, place of registration, address, etc. The system is implemented and simulated in MATLAB, and it performance is tested on real image. It is observed from the experiment that the developed system successfully detects and recognize the vehicle number plate on real images.

LIMITATION OF EXISTING SYSTEM

• Costing: The Existing system is high cost and this is main reason most of the system is failed.

• Technology Complexity: Most of system is the complex to understand, Not user friendly as compare to our proposed system

• Time Consuming Feature: In existing system, the performance is low and most of the time system gets hanged due to load.

• Not Easy to Understand: Systems are complex to understand and they were not user friendly

EXPERIMENTAL SETUP

This section describes the various features of the system and also describes the implementation methods. Following are some of the features explained with their implementation details:

• Pattern Recognition: Pattern recognition is the automated recognition of patterns and regularities in data. It has applications in statistical data analysis, signal processing, image analysis, information retrieval, bio informatics, data compression, computer graphics and machine learning.

• Authentication: Authentication is the act of proving an assertion, such as the identity of a computer system user. In contrast with identification, the act of indicating a person or thing's identity, authentication is the process of verifying that identity.

Hardware and Software Requirements

Hardware Requirements
- Processor dual core or high
- Ram 4 GB or high
- Hard Disk 250GB or high

Software Requirement
- Pycharm 5.4 or above
- Python 4.4 or above
- Dataset

• Python: Python is a computer programming language often used to build websites and software, automate tasks, and conduct data analysis. Python is a general purpose language, meaning it can be used to create a variety of different programs and isn't specialized for any specific problems.

Python has become a staple in data science, allowing data analysts and other professionals to use the language to conduct complex statistical calculations, create data visualizations, build machine learning algorithms, manipulate and analyze data, and complete other data-related tasks. Python can build a wide range of different data visualizations, like line and bar graphs, pie charts, histograms, and 3D plots. Python also has a number of libraries that enable coders to write programs for data analysis and machine learning more quickly and efficiently, like TensorFlow and Keras

Xampp

XAMPP is an abbreviation for cross-platform, Apache, MySQL, PHP and Perl, and it allows you to build WordPress site offline, on a local web server on your computer. This simple and lightweight solution works on Windows, Linux, and Mac – hence the "cross-platform" part. XAMPP (/zæmp/ or /ks. æmp/) is a free and open-source cross-platform web server solution stack package developed by Apache Friends, consisting mainly of the Apache HTTP Server, MariaDB database, and interpreters for scripts written in the PHP and Perl programming languages. XAMPP has the ability to serve web pages on the World Wide Web. A special tool is provided to password-protect the most important parts of the package. XAMPP also provides support for creating and manipulating databases in MariaDB and SQLite among others

SCOPE:

The principal objective of the Fancy number plate ID framework is to perceive the number plates dependably and with more noteworthy proficiency with practically no human mediation. The usefulness of the project gives the capacity to follow a vehicle in any state, track down a taken vehicle, or for overseeing leaving in the shopping centers, and so forth. Ongoing data sources are taken from the front camera. The pictures are handled and the number plate will be recognized. The recognized number plate is then used to look in the information base to check whether it exists or not and send a warning to the RTO office/segment for the Tax.

PROBLEM STATEMENT:

Fancy Number Plate Recognition System (FNPR) is a picture handling innovation which utilizes proficient calculations to recognize the vehicle number from constant pictures. The goal is to plan a proficient Fancy Number Plate Recognition System and to execute it for programmed cost charge assortment. The framework identifies the vehicle first and afterward catches the picture of the front perspective on the vehicle. Vehicle number plate is confined and characters are portioned. The framework is intended for gray-scale pictures so it recognizes the number plate paying little mind to its tone.

SYSTEM ARCHITECTURE

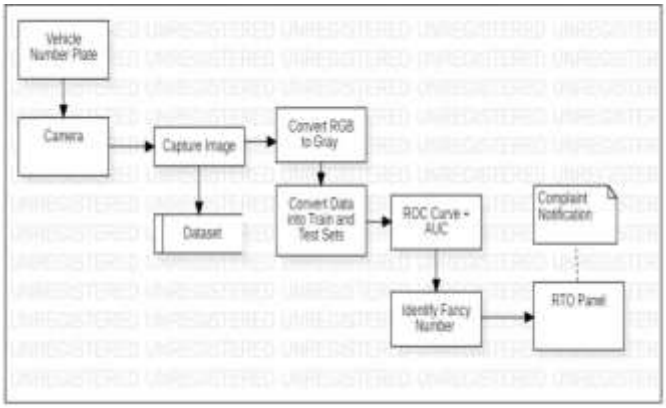

Fig -1: System Architecture Diagram

We are creating a Fancy Number Plate Recognition System (FNR) is a picture handling innovation which utilizes proficient calculations to recognize the vehicle number from constant pictures. We are capturing the image of fancy number plate and store in this system admin manages the users. Admin can delete the data or check the list and manage the data of database. In this system send the notifications to the RTO section and result display in image format.

ADVANTAGES

1. Easy to use
2. High Performace
3. Scalable

METHODOLOGY

The single problem can be solved by different solutions. This considers the performance parameters for each approach. Thus considers the efficiency issues.

- Problem Solving Methods are concerned with efficient realization of functionality. This is an important characteristics of Problem Solving Methods and should be deal with it explicitly.

- Problem Solving Methods achieve this efficiency by making assumptions about resources provided by their context (such as domain knowledge) and by assumptions about the precise definition of the task. It is important to make these assumptions explicit as it give the reason about Problem Solving Methods.

- The process of constructing Problem Solving Methods is assumption based. During this process assumptions are added that facilitate efficient operationalization of the desired functionality

CONCLUSION

We proposed a continuous and productive technique for Vehicle Number acknowledgment and execution of that strategy for programmed cost charge assortment. The system has been caught pictures of extravagant number plates and send the notice to the RTO office.This proposed system distinguishes the extravagant number plate and consequently sends the notice and naturally gathers the cost charge. The system has been tried on many pictures of different lighting conditions and the framework can be carried out on motorways and parkways for programmed cost charge assortment.The proposed arrangement will lessen registration look at the time while inferring other added benefits as far as stopping the executives and traffic observing.In this system, an extravagant number plate will be recognized and diminish the labor of the police division. Likewise, it can give proprietor data utilizing Number Plate. These system have a camera that is explicitly intended for ANPR

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