VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JnanaSangama", Belagavi-590018

FINAL YEAR PROJECT PHASE-0

REPORT ON

"AUTOMATIC LICENSE PLATE RECOGNITION SYSTEM"

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Accurate Detection and Recognition of Vehicle Plate Numbers

OBJECTIVE:

Main objective of the system is automatic number plate recognition (ANPR) in toll payment system.

ABSTRACT:

This paper presents an online highly accurate system for automatic number plate recognition (ANPR) that can be used as a basis for many real-world ITS applications. The system is designed to deal with unclear vehicle plates, variations in weather and lighting conditions, different traffic situations, and high-speed vehicles. This paper addresses various issues by presenting proper hardware platforms along with real-time, robust, and innovative algorithms. We have collected huge and highly inclusive data sets of vehicle license plates for evaluations, comparisons, and improvement of various involved algorithms. The proposed algorithms for each part of the system are highly robust to lighting changes, size variations, plate clarity, and plate skewness.

INTRODUCTION:

Vehicle plate detection and recognition appear in vast variety of applications, including travel time estimation, car counting on highways, traffic violations detection, and surveillance applications. Traffic monitoring cameras are mounted four to seven meters above the street level. Plate recognition range, where the cameras are able to capture the vehicles plates with sufficient resolution, starts from 20 to more than 50 meters away from the camera location. This range depends on the camera resolution and the lens mounted on the camera. At these heights and distances, vehicles plates are not as clearly visible as in other applications such as toll and parking fee payment systems. High camera installation point causes some difficulties against the correct detection of vehicles

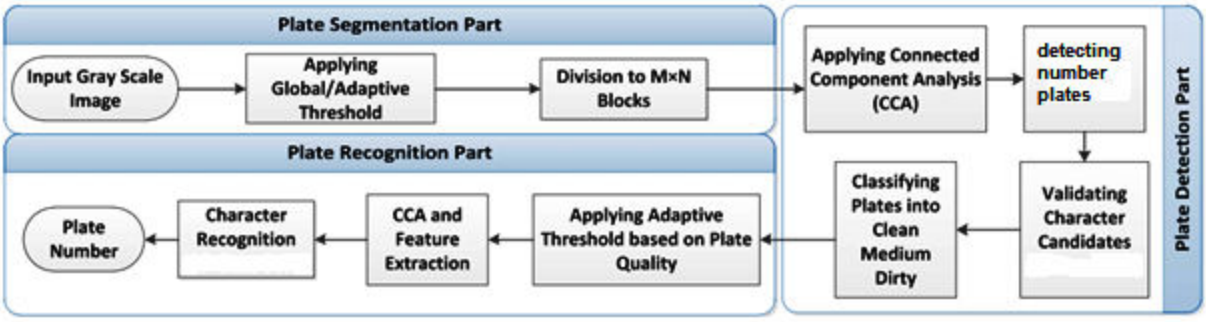
plates. Vehicles with dirty plates make the situation even more complicated. On the other hand, number plate is the only trustworthy identity of a vehicle in Intelligent Transportation Systems (ITS) and correct vehicle identification depends highly on the accuracy of automatic number plate recognition (ANPR) systems.

PROBLEM STATEMENT

In existing system unclear vehicle plates, variations in weather and lighting conditions, different traffic situations, and high-speed vehicles this paper addresses various issues by presenting proper hardware platforms along with real-time, robust, and innovative algorithms.

PROPOSED SYSTEM

This paper addresses various issues by presenting proper hardware platforms along with real-time, robust, and innovative algorithms. We have collected huge and highly inclusive data sets of Persian license plates for evaluations, comparisons, and improvement of various involved algorithms. The data sets include images that were captured from crossroads, streets, and highways, in day and night, various weather conditions, and different plate clarities. Over these data sets, our system achieves 98.7%, 99.2%, and 97.6% accuracies for plate detection, character segmentation, and plate recognition, respectively.



Advantage of Proposed System:

Achieved 100% accuracy in no Plate Detection, character recognition.

METHODOLOGY USED:

Plate Detection

Plate detection refers to a subset of computer technology that is able to identify vehicles number plates within digital images. Plate detection applications focused on detecting within images.

Character Segmentation

In computer vision, image character segmentation is the process of partitioning a digital image into multiple segments (sets of pixels, also known as super-pixels). The goal of segmentation is to simplify and/or change the representation of an image into something that is more meaningful and easier to analyze. Image segmentation is typically used to locate objects and boundaries (lines, curves, etc.) in images. More precisely, image segmentation is the process of assigning a label to every pixel in an image such that pixels with the same label share certain characteristics.

The result of image character segmentation is a set of segments that collectively cover the entire image, or a set of contours extracted from the image (see edge detection). Each of the pixels in a region are similar with respect to some characteristic or computed property, such as color, intensity, or texture. Adjacent regions are significantly different with respect to the same characteristic.

Character Recognition using OCR

Character Recognition describes a biometric technology that attempts to establish an individual's identity. Also known as facial recognition, the process works using application that captures a digital image of an individual's character recognition using OCR.

Amount Detection & Automatic Mail sending system

In toll gate when vehicles are crossing that time detects vehicles number and amount detects details mail send to the user.

HARDWARE & SOFTWARE REQUIREMENTS:

HARDWARE REQUIREMENTS:

· **System** : Pentium IV 2.4 GHz.

· **Hard Disk** : 500 GB.

· **Ram** : 4 GB

- *Any desktop / Laptop system with above configuration or higher level*

SOFTWARE REQUIREMENTS:

Operating system	:	Windows XP / 7
Coding Language	:	Java (Jdk 1.7)
Web Technology	:	Servlet, JSP
Web Server	:	TomCAT 7.0
IDE	:	Eclipse Galileo
Database	:	My-SQL 5.0
UGI for DB	:	SQLyog

JDBC Connection : Type 4

Literature survey:

Title 1: SYSTEM FOR COLLISION PREDICTION AND TRAFFIC VIOLATION DETECTION

Abstract: The invention refers to a system for monitoring, analyzing and reporting incidences of traffic violations at a predetermined area in real -time, prospectively or retrospectively. Specifically, the invention refers to a system and method of monitoring, analyzing, predicting and reporting or Warning the incidence of a past or imminent traffic violation by acquiring a moving object Within a predetermined boundary, assigning a path to the moving object and based on a plurality of thresh olds, determining the likelihood of a traffic violation type and occurrence.

Title 2: A hybrid License Plate Extraction Method Based On Edge Statistics and Morphology

Abstract: A hybrid license plate extraction algorithm based on the edge statistics and morphology for monitoring the highway ticketing systems. The method can improve the location rate only by the edge statistics. The proposed approach can be divided into four sections, which are, vertical edge detection, edge statistical analysis, hierarchical-based license plate location, and morphology-based license plate extraction. The algorithm can quickly and correctly detect the region of vehicle license plates. Under the experiment databases, which were taken from real scene, 9786 from 9825 images are successfully detected. The average accuracy of locating vehicle license plate is 99.6% .

Title 3: An Improved Sobel Edge Detection

Abstract: A method which combines Sobel edge detection operator and soft-threshold wavelet de-noising to do edge detection on images which include White Gaussian noises. In recent years, a lot of edge detection methods are proposed. The

commonly used methods which combine mean de-noising and Sobel operator or median filtering and Sobel operator can not remove salt and pepper noise very well. In this paper, we firstly use soft-threshold wavelet to remove noise, then use Sobel edge detection operator to do edge detection on the image. This method is mainly used on the images which includes White Gaussian noises. Through the pictures obtained by the experiment, we can see very clearly that, compared to the traditional edge detection methods, the method proposed in this paper has a more obvious effect on edge detection.

Title 4: Combining Hough Transform and Contour Algorithm for detecting Vehiclesí License-Plates

Abstract: Vehicle license plate (VLP) recognition is an interesting problem that has attracted many computer vision research groups. One of the most important and difficult task of this problem is VLP detecting. It is not only used in VLP recognition systems but also useful to many traffic management systems. Our method is used for the VLP recognition system that deals with Vietnamese VLPs and it can also be applied to other types of VLPs with minor changes. There are various approaches to this problem, such as texture-based, morphology-based and boundary linebased. In this paper, we present the boundary line-based method that optimizes speed and accuracy by combining the Hough transform and Contour algorithm. The enhancement of applying the Hough transform to contour images is that the much improved speed of the algorithm. In addition, the algorithm can be used on VLP images that have been taken from various distances and have inclined angles between ±300 from the camera. Especially, it can detect plates in images has more than one VLP. The algorithm was evaluated in two image sets with accuracy of about 99% (see 3.3).

Title 5: An Efficient Method for Correcting Vehicle License Plate Tilt

Abstract: Tilt correction is a very crucial and inevitable task in the automatic recognition of the vehicle license plate (VLP). In this paper, according to the least square fitting with perpendicular offsets (LSFPO) the VLP region is fitted to a straight line. After the line slope is obtained, rotation angle of the VLP is estimated. Then the whole image is rotated for tilt correction in horizontal direction by this angle. Tilt correction in vertical direction by inverse affine transformation is proposed for removing shear from the LP candidates. Despite the success of VLP detection approaches in the past decades, a few of them can effectively locate license plate (LP), even when vehicle bodies and LPs have similar color. A common drawback of color-based VLP detection is the failure to detect the boundaries or border of LPs. In this paper, we propose a modified recursive labeling algorithm for solving this problem and detecting candidate regions. According to different colored LP, these candidate regions may include LP regions. Geometrical properties of the LP such as area, bounding box and aspect ratio are then used for classification. Various LP images were used with a variety of conditions to test the proposed method and results are presented to prove its effectiveness.