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REAL TIME APPLICATION TO IDENTIFY UNIVERSITY BUSES FOR SECURITY SYSTEM

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ABSTRACT

Number plate recognition system has the following process such as extraction of plate region, segmentation of characters and number plate characters used to recognize their characters. For extracting the Plate region the ant colony algorithm was performed which detect the edges. The ACO method works on the behavior of ants which provide better result in edge detection. In segmentation part, morphological operation such as filtering, thinning, etc. are performed which convert the number plate, suitable for the character recognition methods. Then character recognition on the number plate was performed using OCR methods (optical character recognition) which convert the structure into character that brings the major result such that the car number was extracted. Based on the extracted numbers the desired operation can be performed.

Keywords: security system, average filter, contrast limited adaptive histogram equalization, morphological algorithm, OCR values.

1. INTRODUCTION

Number plate recognition is a methodology used for optical character recognition (OCR) by applying images to read the number plate and identify it. It mainly used for closed-circuit television that used to rectify the number plate recognition, cameras used to identify the images, or cameras specifically designed for the task. Number plate recognition is mainly used by policeman to identify the number plate of its required owner details and mainly used the world for law enforcement purposes. Normally electronic toll collection is used to pay the roads and the method of traffic can normally affects highways agencies.

Automatic number plate recognition is mainly used to images stored in it. It captures the image by using cameras by recognize the text used in license plate stored the driver details used with their photograph. Systems commonly used their infrared lighting which allows the camera used to snap the pictures. ANPR methodology turn the specific region to control the character plate varies from one place to another. This system normally used for privacy issues of government, movements switched affects the traffic, misidentification, high and increased their government instruction. In this paper mainly used for proposed algorithm is based on extraction of plate region, number plate can be segmented by using characters and recognition of characters with every format.

Extraction of plate may be risk. Essentially, the difficulty can be due to the following reasons:

1. A small portion of the image occupied by number plate.
2. License plates used for different formats, styles and colours for every country to others.
3. In different techniques used for detecting the number plate is obtained without their basics of the license plate's image used in required location.
4., Blur image, uneven or low illumination, vehicle motion level used for edge detection, low level image resolution, distortion of characters recognition, dirty plate, shadows or reflection etc. can be used for Probability used by finding some drawbacks which could influence the efficiency of the extraction.

ANPR normally used for image (camera) can be acquired by optical character recognition (OCR). For e.g.: registration plates used for Dutch vehicle to recognise their number plate to identify the pattern recognition with different formats used in it. Some license plate arrangement used to vary the number plate recognition for font sizes and position to identify the license plate of the respective drivers attached in the certain database stored in it. This system normally used for such differences can be placed with each other to manage with license plate. More difficult system used for international variants and many programs normally identify with each country. The cameras acquired by using images mainly used to include the existing rule enforcement or circuit television cameras, as well as mobile units formally attached to vehicles through respective image analysis to recognise the pattern by using infrared cameras to take a clearer image of the plates.

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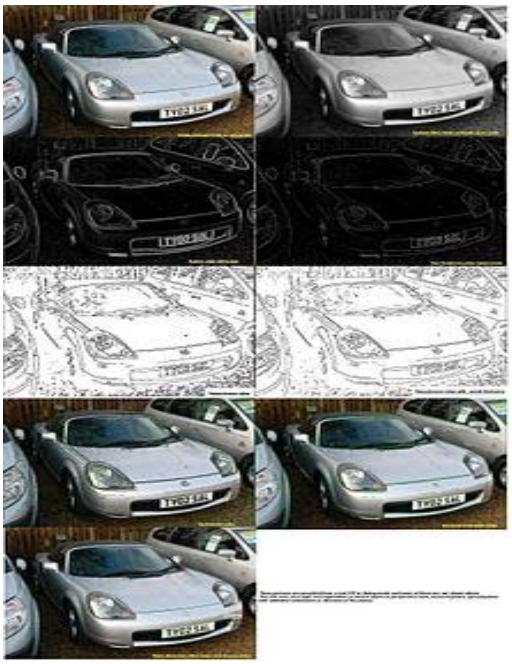

Figure-1. License-plate recognition process.

Automated License Plate Recognition (ALPR) is a different technique mainly used for optical character recognition (OCR) normally accepts the read license plate characters. Two types of ALPR can be mainly sub divided namely: Infrared (IR) cameras acquired stationary for high fixed points, and mobile, which uses vehicle-mounted IR cameras.

Mobile ALPR software is best suited for multiple cameras mounted by acquiring vehicle images to identify their certain data sets. When the vehicle moves towards their photographs license plates and transfer a plate data to one database to another database. Many devices used for different databases to control their histogram. It mainly created at the local level database and downloaded into the vehicles on board computer at the beginning of each shift. If the system detects a match, the officer receives an alert their computer feature extraction. Mobile ALPR finally identifies their read up to 1,000 plates per hour and cover two or more lanes of traffic at once.

It Uses for Automated License Plate Recognition such as recovering stolen and their parameters used to identify the scope, Identifying drivers with an open warrant for arrest. By compare their average time it takes to get from stationary camera A to stationary camera B. Determining what cars do and do not belong in a parking garage. Expediting parking by eliminating the need for human confirmation of parking passes. ALPR is known by several other names, including Automatic Number Plate Recognition (ANPR), Automatic Vehicle Identification (AVI), Car Plate Recognition (CPR), License Plate Recognition (LPR), and Lecture Automatic de Plaques d'Immatriculation (LAPI).

2. LITERATURE SURVEY

A. Number plate extraction

Chittode J S *et al*. proposed an algorithm which is applied on the car park systems to access parking services. Algorithm is based on morphological operations and area criteria test used for number plate recognition. Recognition of characters in number plate is done with optical character.

Peng H *et al.* presented an algorithm for "Document Image Recognition". DIR find most matched template for input document image in a database. The algorithm is based on the global matching of CBP.

Chunyu C *et al*. presented a methodology which is helpful in recognition of number plate. The methodology was implemented in MATLAB. The character is recognized with the help of image pre-processing, edge extraction and segmentation of characters.

Lekhana G.C *et al.* developed a real time on-line license plate recognition system. LPR algorithm is composed of different steps which are image acquisition, character segmentation through fusion of spectral analysis, character recognition through support vector machines.

Paunwala C.N *et al*. proposed a method which aims to identify ROI by allowing morphological processing and sequence of directional segmentation. The ROI contains the number plate from which characters are recognized. This method is tested on a database consisting of 750 images at different conditions.

Singh M *et al*. presented an approach based on morphological opening and closing operations. The number plate is extracted by using this approach. After localization skew correction of number plate is done for effective segmentation of characters. The character extraction is done with the help of templateatching.

Kranti S *et al.* presented a "Feature based number plate localization "method for number plate recognition and extraction. This methodology mainly focuses on two methods i.e. edge detection method and window filtering method. International Journal of Computer Applications (0975 - 8887) Volume 88 - No.3, February 2014

Ganapathy V et al. proposed a methodology which is helpful in the number plate recognition for vehicles in Malaysia. The proposed methodology is the combination of morphological process and Hough transform. An Experimental result shows accuracy of 95%.

Othman K *et al*. used texture based approach which is based on edge information for the license plate localization and recognition. Segmentation of characters is done with the help of multi-layer perceptron neural network.

B. Simulink model block set

Gupta P *et al*. developed a Simulink model for the traffic load computation. The approach used is corner detection. This block counts the number of corners of vehicle and with the help of corners number of vehicles is calculated at the junction.

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Kamboj A *et al*. presented an efficient Simulink model for image segmentation. The main focus is on processing an image pixel by pixel and modification of pixel of neighborhoods. Blocks of video and image processing are used.

Alalfi M H *et al*. described code-based clone detection technique for efficient identification of near miss clone in Simulink models. Main aim to leverage text based clone detection technique.

Boulmalf M *et al.* provided an efficient method for teaching digital and analog modulation for undergraduate students in an information technology program. Simulink model simulates analog and digital modulation techniques exempting any derivation of mathematical formulas.

3. PROPOSED METHODOLOGY

The number plate recognition to identify the license plate mainly concluded for four main type's namely Pre-processing, edge detection, histogram equalisation, segmentation and character matching is shown in the Figure-2. This method is used to reduce the process time which is used to identify the number plate extraction from the given input.

A. Preprocessing

The objective of the pre-processing is used to remove all the low frequency noise, intensity variation, and resizing process which is used to normalize the hazy images to separate the frame and planes respectively
Basic steps in pre-processing step are:

1. Gray scale conversion

The Original number plate image is converted to gray scale image for easy implementation. It mainly used for data size reduces and further computational time .All input image size can be resized as 256 x 256 for gray scale conversion.

2. Filtering

In filtering, average filter and low pass filter is used for digital filtering technique. It removes the Gaussian noise by enhancing the performance of the given input. It eliminates the noise and distortion for further implementation.

3. Edge detection

The Canny edge detector utilises the multi stage algorithm to find out character pattern in the captured image. The various processes occurs in Canny edge detection algorithm are as follows

a) By using average filter it smoothens the image to remove the noise
b) Intensity of the image is determined for further processing.
c) Double threshold can be applied to detect the character pattern along their potential edges
d) Finally tracking their edges in the number plate is done to supress the weak edges.

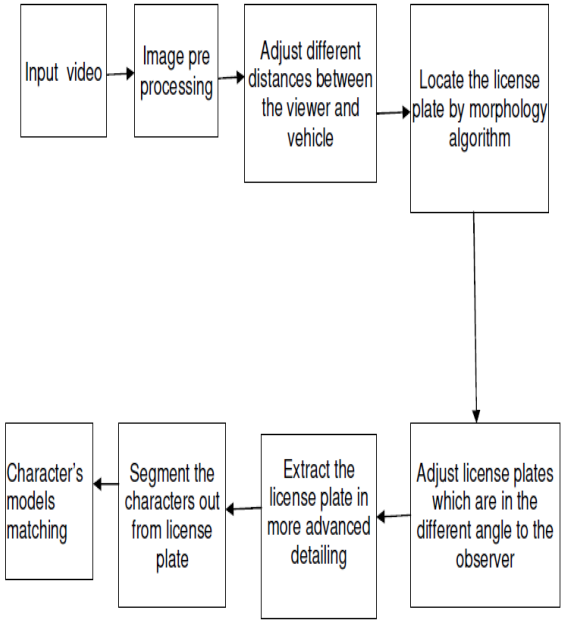

Figure-2. Block diagram of the proposed work.

B) Segmentation of number plate

The separation of frames and planes can be used for almost always progressive. Then the 3 planes of pixel values (Y, U, and V) can be separated and each frame their pixel can be established their depth through their interlaced scanning. Pixel depth can be initiated their each geometry of each plane: width x height. Chrominance is generally subsampled and the planes can be related with each other.

Frame rate can be approximately found their input videos and plane also separated by using 2 chrominance samples for every 4 luminance samples, odd lines only and Chrominance can be sub divided in both directions.

C) Feature extraction

It can be extracted for number plate can identify the license given in input. Normally number plate image used for image processing techniques such as preprocessing technique used to convert the original image into gray level images. It mainly used for average filter to remove the noise. Histogram is used to find the intensity level of the number plate of the respective license plate. It can be extracted without map minimization method. It is used to find the ratio between the OCR level and horizontal and vertical edge processing histogram with efficient technique will help to check the recognition of number plate of the identify the license plate. It mainly locate the number plate by using morphological algorithm and adjust the different angles.Finally used to identify the predefined number plate with the extraction number has been matched and it can be obtained from OCR results.

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D) Ant Colony Algorithm (ACO)

ANT becomes a very limited effevtive.But it becomes a well –organised colony it acts as a powerfentfor the development of the colony.The lives only for the colony and part to that for the development. Ant colonies are described as superorganism because colony appears as unified entity.

Each ant algorithm is able to communicate, learn, cooperate, and together they are capable of developing and colonising themselves into a large area. They manage this by increasing the number of individuals and being well organised. The self organising principles are highly coordinated behaviour of the colony,and furthermore bringing them to accomplish complex tasks, whose difficulty tasks are exceed by individual capabilities of a single ant.

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Figure-3. ACO algorithm.

Low pass filter has been employed in order to preserve the high-frequency components of the image. LPF separates the image into different sub band images, namely, LL, LH, HL, and HH. Low frequency sub band contains overall brightness of an input and high-frequency sub band contains the edge information of input image. There is no down sampling process while separating high frequency coefficients from an image. This transform is used to preserve edge details and textures of an image and Daubechies type wavelet filter is used here for determine the detailed Coefficients.

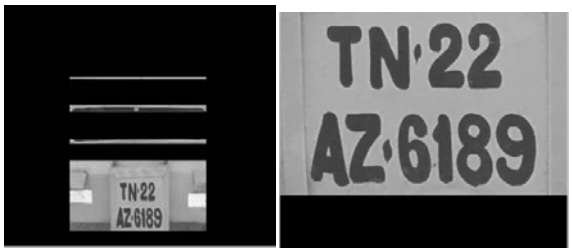

Figure-4. SWT transform output to remove the salt and pepper noise.

The two different methods to remove the hazy scene in the input videos namely, they are:

a) Classical DWT is not shift invariant: This means that DWT of a translated version of a signal x is not the same as the DWT of the original signal.
b) Shift-invariance is important in many applications such as Change Detection, Denoising and Pattern Recognition
c) The decimation can be carried out by choosing the odd indices. It perform all possible DWTs decomposition of the input signal and can perform both 2J decompositions for J decomposition levels.

ε-decimated DWT are all shifted versions of normal DWT applied to the shifted sequence by coefficients yielded. Apply high and low pass filters to the data at each level mainly not decimate with each other methods. It modified their filters at each level by padding them with zeros. Finally computationally more complex than any other wavelet techniques to remove the hazy scenes.

Figure-5. (a) Character recognition (b) Character extraction of number plate.

Finally, One source of difficulties when processing outdoor images is the presence of haze, fog or smoke which fades the colors and reduces the contrast their objects to find the intensity and performance. We introduce a novel algorithm and variants for visibility restoration from a single image.

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4. PERFORMANCE ANALYSIS

A. Horizontal and vertical edge processing

It Collects the statics of air light colors from 100+ natural images Manually it selects 32x32 pixel in the number plate with "full haze" colour. The Air light colors are scattered around 28.9658 degrees line in hue-saturation plane, and mostly close to the origin that is in the low Saturation.

It can extract license plate up to 13x13 pixels from hazy image according to the following criteria: The license plate contains same transmission message with same pixels and hue and Performance along with the direction Rand with different magnitudes. The pixels in the license plate do not have too low or too high transmission rate.

It extracts their plate upto 13x13 pixels from hazy image according to the following criteria: They used two techniques namely plate contains pixels with same transmission and hue but with different shades (=> same direction for R but different magnitudes) namely

a) The pixels in the license plates do not have too low or too high transmission rate.
b) Pixels in the number or license plate they do not have too low saturation and hue is in realible
c) Pixels in the plate are not too dark or too bright in average range, and variance should not be too high in noise or too low and homogeneous areas with no shaded plate

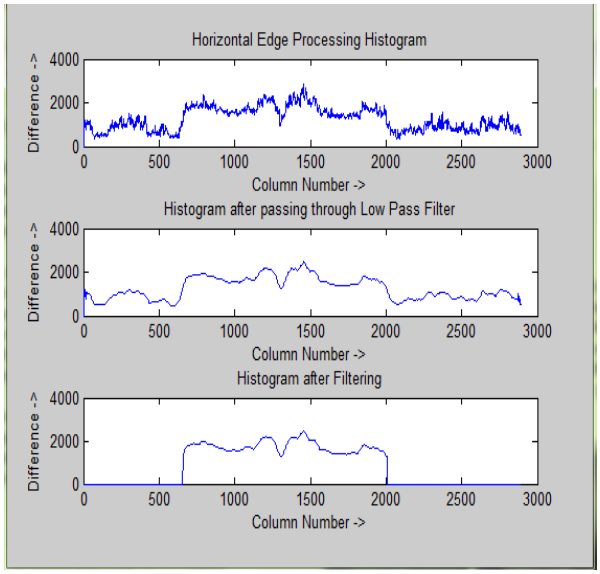

Figure-6. Horizontal edge processing histogram.

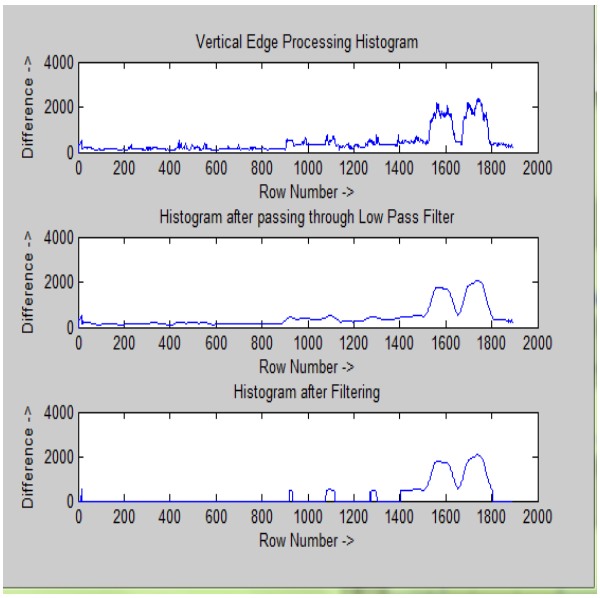

Figure-7. Vertical edge processing histogram.

5. CONCLUSIONS

We conclude from analysis that number plate is properly extracted and recognized with 100% accuracy. Model has been developed using Simulink Block set in MATLAB which can be implemented on the hardware by using the HDL code generator in MATLAB and real time number plate extraction system is made.

FUTURE SCOPE

There is a scope in the future where the system can be able to work where the number plate, the color and the font of the plate is identical with varied font sizes. The system should not compromise and it should be sensitive and should be able to locate the plate at any conditions as tracking stolen vehicles and monitoring vehicles for homeland security.

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