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RESEARCH ARTICLE

ENHANCEMENT IN LICENSE NUMBER PLATE SYSTEM USING K-NEIGHBOR NEAREST ALGORTHM

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Abstract— Image processing system treat images as two dimensional signals and set of signals processing methods are applied to them. LPR is also one of the applications of image processing. Till now, all the LPR systems have been developed using neural networks. In this paper we proposed to implement the system using Gabor filter, OCR and Vision Assistant to make the system faster and more efficient. To recognize number plate first of all add templates from A-z and 0-9 and add them into mat file. After that read the image and convert that image into grey scale. Now the next step is to find out threshold value of the image. After finding T-value convert that image into binary. In this work, we also use median filter & Gabor filter in which we made cell in which different-different subplot based on pixel value.

Keywords— LPR, 2D Image, KNN, Gabor filter

I. INTRODUCTION

Image processing is used in a wide variety of applications to improve the visual appearance of images and to prepare images for measurement. Image processing usually refers digital image processing but optical and analog image processing also are possible. This article is about general techniques that apply to all of them. The acquisition of images is referred to as an imaging. Image processing is also known as digital image processing [7]. LPR is an application of image License Plate Recognition (LPR) is an image processing technology which is used to recognize vehicles by their license plates. This expertise is in advanced popularity in security and traffic installations. License plate recognition system is an application of computer vision. Computer system is a method of using a computer to take out high level information from a digital image. The useless homogeny among different license plates such as its dimension and the outline of the license plate.

The Automatic Number Plate Recognition: ANPR is a mass surveillance method that uses optical character recognition on images to read the license plates on vehicles. They can use existing closed-circuit television or road-rule enforcement cameras, or ones specifically designed for the task. They are used by various police forces and as a method of electronic toll collection on pay-per-use roads and monitoring traffic activity, such as red light adherence in an intersection. ANPR can be used to store the images captured by the cameras as well as the text from the license plate, with some configurable to store a photograph of the driver. Systems commonly use infrared lighting to allow the camera to take the picture at any time of the day. A powerful flash is included at least one version of the intersection monitoring cameras, serving both to illuminate the picture and to make

the offender aware of his or her mistake. ANPR technology tends to be region-specific, owing to plate variation from place to place. LPR is an image-processing technology used to identify vehicles by their license plates. This technology is used in various security and traffic applications. In this paper we will discussed about License Plate Recognization and proposed methodology in detail.

II. LITERATURE REVIEW

In this paper [1] they introduced that the process of vehicle number plate recognition requires a very high degree of accuracy when we are working on a very busy road or parking which may not be possible manually as a human being tends to get fatigued due to monotonous nature of the job and they cannot keep track of the vehicles when there are multiple vehicles are passing in a very short time .To overcome this problem, many effort have been made by the researchers across the globe for last many years. A similar effort has been made in this work to develop an accurate and automatic number plate recognition system. It may be concluded that the project has been by and far successful. It can give us a relative advantage of data acquisition and online warning in case of stolen vehicles which is not possible by traditional man handled check posts. While thousands of vehicles pass in a day. Though we have achieved an accuracy of 98% by optimizing various parameters, it is required that for the task as sensitive as tracking stolen vehicles and monitoring vehicles for homeland security an accuracy of 100% cannot be compromised with. Therefore to achieve this, further optimization is required. Also, the issues like stains, smudges, blurred regions & different font style and sizes are need to be taken care of. This work can be further extended to minimize the errors due to them. In this paper [2] Automatic recognition of car license plate number became a very important in our daily life is introduced. because of the unlimited increase of cars and transportation systems which make it impossible to be fully managed and monitored by humans, examples are so many like traffic monitoring, tracking stolen cars, managing parking toll, red-light violation enforcement, border and customs checkpoints. Yet it's a very challenging problem, due to the diversity of plate formats, different scales, rotations and non-uniform illumination conditions during image acquisition. This paper mainly introduces an Automatic Number Plate Recognition System (ANPR) using Morphological operations, Histogram manipulation and Edge detection Techniques for plate localization and characters segmentation. Artificial Neural Networks are used for character classification and recognition. In this paper [3] proposed the ultrasound liver image enhancement based on watershed segmentation method. Image segmentation is an important problem in medical image processing fields. The focus of this study is to enhance the region of liver based on watershed algorithm of segmentation and visualization technique. The MATLAB is used as a tool for this study. The watershed segmentation entirely relay presented the good result base on the contrast of the image. In this study, an ultrasound image is transformed into a binary image using the threshold method, which means that the color of the output image appears only black and white. After the image is converted into binary, the image is modified using Watershed technique together with the visualization process. The result is really helpful in medical diagnostics. In this [4] paper has presented an intelligent system for parking space detection based on image processing technique that capture and process the brown rounded image drawn at parking lot and produce the information of the empty car parking spaces. It will be display at the display unit that consists of seven segments in real time. The seven segments display shows the number of current available parking lots in the parking area. This proposed system, has been developed in software and hardware platform.

III. LICENSE PLATE RECOGNITION

License plate recognition (LPR) is an image-processing technology which is used to recognize vehicles by their license plates [3]. This expertise is in advance popularity in security and traffic installations. License plate recognition system is an application of computer vision. Computer vision is a method of using a computer to take out high level information from a digital image. The useless homogeny among different license plates such as its dimension and the outline of the license plate. LPR system consists of the following four stages [10]:

1. Image Acquisition
2. License plate extraction
3. License plate segmentation
4. License plate recognition phases.

Image Acquisition: With the help of sensor image is captured and digitized it with the help of analog to digital convertor only when image is in analog form. used an image acquisition card that converts video signals to digital images based on some hardware-based image pre-processing. It consist of three parts [9]. These parts as follow:

Optical System: This is non-electronic part which is consists of lenses and other similar parts. Image input is given in this part. It deforms the image.

Sensor: It is another important part of the system which transform optical signal to electrical equivalent [6].

Digitizer: In this part an analog electric equivalent is transformed to the digital version within two procedures first sampling and quantization [7].

IV. LICENSE PLATE EXTRACTION

License plate extraction is the most important phase in an LPR system [1]. This method is based on scale shape analysis, which in rotate is based on the hypothesis that, characters have line-type shapes nearby and blob-type shapes globally. In the scale shape analysis, Gaussian filters at various balances blur the given image and larger size shapes has emerge at larger scales. To notice these scales the design of principal curvature plane is introduced. By means of normalized principal curvatures, characteristic points are extracted from the scale space x-y-t. The position (x, y) indicates the position of the outline and the degree t indicates the inbuilt characteristic dimension of corresponding figures. All these characteristic points facilitate the pulling out of the shape from the established image that has line-type shapes in the vicinity and blob-type shapes globally. Finally the record of horizontal and vertical line segments is collective and any rectangular regions harmonizing the dimensions of a license plate are kept as candidate regions. The disadvantage of, this method is that it requires huge memory and is computationally costly.

License plate segmentation: The fundamental idea after region growing is to recognize one or more criteria that are quality for the desired region. After establishing the criteria, the image is searched for any pixels that fulfill the requirements. Whenever such a pixel is encountered, its neighbors are checked, and if any of the neighbors also equal the criteria, both the pixels are measured as belong to the same region [5].

Recognition: It presents the methods that were used to categorize and then recognize the individual characters. The classification is based on the extracted features. These features are then classified using either the statistical, syntactic or neural approaches.

V. PROPOSED METHODOLOGY

Traffic problems are significant in a developing or developed country. Massive integration of information technologies into all aspects of modern life caused demand for processing vehicles as conceptual resources in information systems. Because a standalone information system without any data has no sense, there was also a need to transform information about vehicles between the reality and information systems. This can be achieved by a human agent, or by special intelligent equipment which is able to recognize vehicles by their number plates in a real environment and reflect it into conceptual resources. Because of this, various recognition techniques have been developed and number plate recognition systems are today used in various traffic and security applications, such as parking, access and border control, or tracking of stolen cars. Till now, all the LPR systems have been developed using neural networks. This work proposes to implement the system using Gabor filter, OCR and Vision Assistant to make the system faster and more efficient. To recognize number plate first of all add templates from A-z and 0-9 and add them into mat file. After that read the image and convert that image into grey scale. Now the next step is to find out threshold value of the image. After finding T-value convert that image into binary. In this work, we also use median filter & Gabor filter in which we made cell in which different-different subplot based on pixel value.

VI. EXPERIMENTAL RESULTS

The proposed algorithm has been implemented on MATLAB tool.

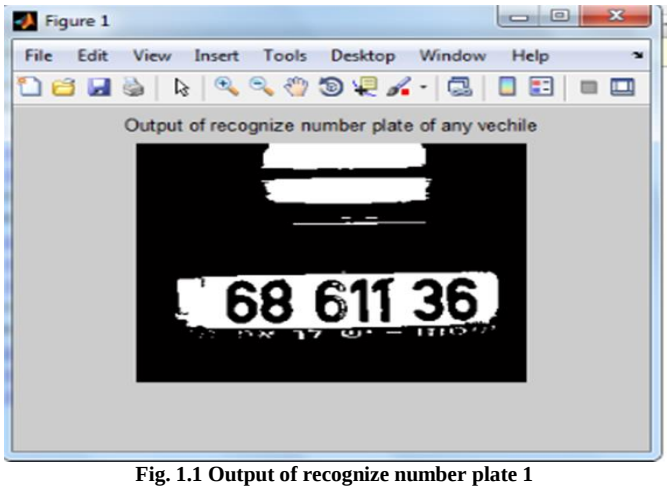

Fig. 1.1 Output of recognize number plate 1

Fig. 1.1 Illustrate that number plate is recognized using algorithm. Only fixed font size and bold numbers are recognized in this image.

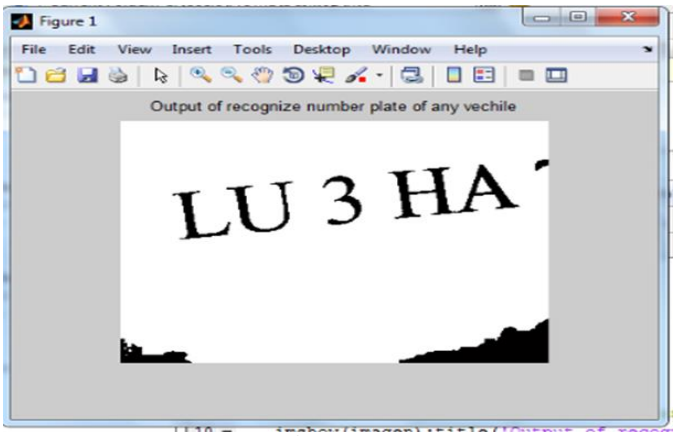

Fig .1.2 Output of recognize number plate 2

Fig.1.2 Illustrate that number plate is recognized using algorithm. Only fixed font size and bold numbers are recognized in this image.

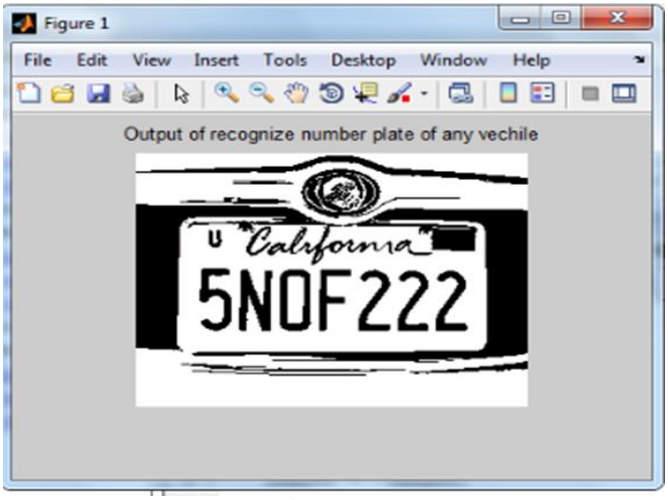

Fig. 1.3 Output of recognize number plate 3

Fig 1.3 is also recognized using algorithm. As an output bold and fixed size letters are recognized.

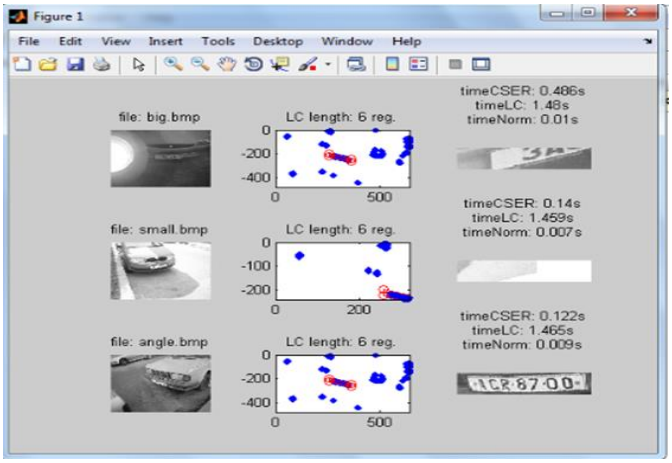

Fig. 1.4 Number Plate Recognize using Euclidean distance

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