

Method for Recognition of Vehicles with Kannada Number Plate

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ABSTRACT

For an intelligent transport system license plate location and vehicle license plate recognition is an important phase. The objective of this work is to design & implement a method for Number Plate Recognition (NPR) of Kannada number plates. This paper presents a method of number plate recognition, segmentation & recognition of the characters present in the Kannada number plate. The images of various vehicles have been taken manually and converted into gray-scale images. The wiener2 filter is used to remove the noise located in the number plates. The segmentation of gray-scale image generated by finding edges using sobel filter for smoothing image is used to reduce the number of connected component & then bwlable is used to calculate the connected component & at the last single character is detected. The result shows that the proposed method have achieved accuracy of 85%.

Keywords

Kannada Number Plate Recognition, Segmentation, Noise and Filter

1. INTRODUCTION

Number plate recognition (NPR) of Kannada number plate is an image processing technology used to identify vehicles by their number plates. NPR is one form of intelligent transport system (ITS) technology that not only recognizes and counts the vehicles[1] but distinguishes each as a unique. ITS becomes more and more important in traffic management[2] due to wide use of computing technology. A number plate recognition system can be conceptually considered as containing 2 separate processing stages: i)Number plate localization(NPL) ii) Number plate character recognition(NPCR).

Number plate localization is an important phase in vehicle number plate recognition. It can be used in many applications such as entrance check, security, parking control and speed control and so on.

However sets of blurred snapshots gives worse recognition rates than a set of clear snapshots[3]. Due to rapidly increasing number of vehicles vehicle number plate recognition system has become one of the most important digital image processing systems to be used[4]. This NPR

system will solve many problems which is hard to be controlled by human being 24 hours. Number plate recognition is still facing a lot of difficulties to be able to recognize number plates and one of these difficulties is the large variety of plates.

2. RELATED WORK

In this paper a method is proposed for detecting the vehicles with Kannada number plate will be the input image, from this input image gray-scale image is formed and segment the characters contained in number plate of vehicles. For real time application a number plate recognition requires a video camera which takes the image of vehicles from rear or front[5] for the present work. The images of various parked vehicles have been captured manually [6] from the camera there after fed to the software to get converted into gray-scale image, then the gray-scale image is converted into binary image which is segmented and then recognition of highest probability of Kannada number plate, the single character is detected. The first processing stage deals with identifying the position of the number plate within the image under consideration[7].

3. METHODS AND IMPLEMENTATION

The following list of steps takes place in implementation of Kannada number plate recognition.

STEP 1: The Kannada Number Plate recognition system has a camera which takes vehicle number plate image.

STEP 2: The Kannada Number Plate Recognition system will convert the images of number plate to gray-scale images and then gray-scale image is converted into binary images which consist of 0's and 1's[8].

STEP 3: From the binary images the system will segment the characters of number plate to individual figure.

STEP 4: All the character and numbers will then be changed to binary form in terms of matrix.

STEP 5: GUI will be used to display the process of the number plate being captured.

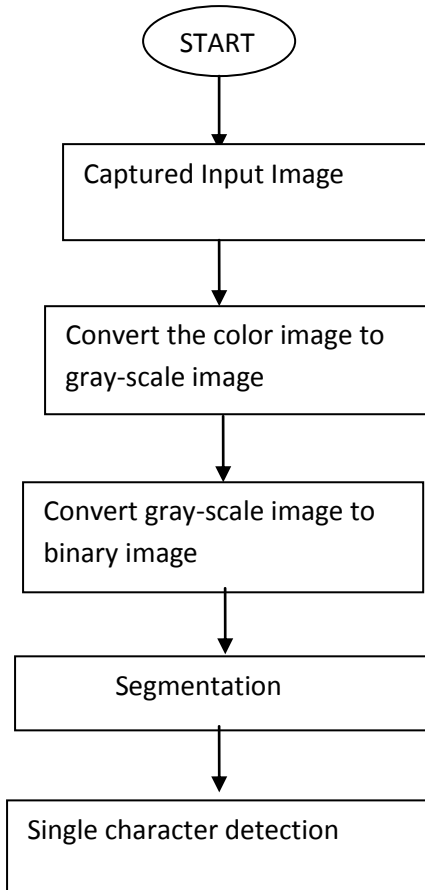


Fig 1- The flow diagram for proposed system



Fig 2- Input image



Fig 3- Gray Scale image

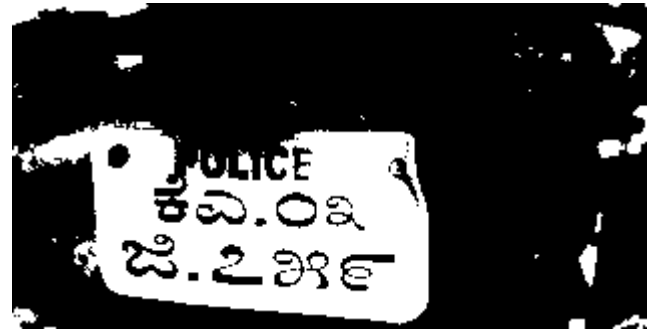


Fig 4- Binary image of number plate

4. SEGMENTATION & RESULTS

For segmentation and detection of edges in characters we use sobel filter. Segmentation method which is used to separate the pixel consisting of the number plate character from the background pixels[9]. The result of segmentation is shown in fig 5.

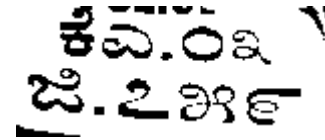


Fig 5: Segmented image

After vehicle number plate features have been extracted from the captured images, feature segmentation is carried out to separate individual elements. In case of vehicles with Kannada number plates, the Kannada characters and numbers are separated to form a single character. Now this set is ready to be presented to the neural network recognizing the Kannada characters and Kannada numbers. The single character detection has been shown in fig 6.



Fig6: Single character detection

Table 1 shows recognition accuracy rate on real scene samples of number plates of different languages

S.No	Research Papers	Real Time Data	Images correctly Detected	Character Known	Results
1	Kok Kiaw T et al (2003)	60	49	50	83%
2	F Martin et al (2002)	75	67	66	88%
3	Anish L et al (2011)	50	46	49	98%
4	Proposed work	30	28	30	85%

Most of the work done on image processing methods like segmentation, thresholding, converting to gray scale from color image and then feature extraction for recognition system[10].

5. CONCLUSION AND FUTURE SCOPE

The process of vehicles with Kannada number plate recognition requires high degree of accuracy. A effort has been made in this work to develop an accurate and automatic Kannada number plate recognition system. Neural network and fuzzy logic is use in MATLAB to obtain the results.

The setup has been tested for 30 vehicles containing different Kannada number plates. We got an overall efficiency of 85% for this NPR system. Though this accuracy is not acceptable but still NPR system can be used for vehicle identification. Though we have achieved an accuracy of 85% by optimizing various parameters it is required that for the task as a sensitive as tracking the stolen vehicles and monitoring the vehicles with Kannada number plates for homeland security an accuracy of 100% cannot be agreed with. Therefore to achieve 100% further optimization is required. Also, the issues like stains, blurred regions, different font styles and sizes and handwritten number plates are needed to be taken care of.

6. REFERENCES

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