Research Paper

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Karnataka State Vehicle Number Plate Segmentation and Feature Extraction

Computer Science

KEYWORDS : Image segmentation, Feature extraction, Median Filter.

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ABSTRACT

In this paper simple algorithm is presented to segment and extract the numbers from vehicle number plate. This algorithm has many applications like in traffic to detect the vehicle numbers which are violated the traffic rules, to trace the vehicle in case of theft, highway electronic toll collection, border customs checkpoints and many more. By using digital image processing techniques the only number plate image is segmenting and characters and numbers are extracted and stored for further use. This paper presents simple techniques for segmenting and extraction. First noise was removed by using Median filter then smoothing image to reduce the number of connected components, calculating connected components, extracting all connected components and storing the extracted image in an array.

INTRODUCTION

Take one sad scenario where one small kid got kidnapped by kidnappers they took that child in the their vehicle and moving out from the city. If that city installed the cameras on streets then those camera took the photograph of that vehicles number plate. Then the police department people will process that photograph and they extract the number from that number plate image. Then they search the information related to vehicle where they find that vehicle with whos name that is registered along with addres. This process made easy to police department to trace the kidnapppers. In this paper one simple algorithm is proposed where the number plate image is detected and the numbers are extracted.

Some interoduction about image segmentation and Feature extraction is given below

Image Segmentation

Image segmentation refers to a process of dividing the image into disjoint regions that are meaningful. This process is fundamental in computer vision in that many applications, such as image retrieval, visual summary, and image based modeling can benefit from it. This process is challenging because segmentation is usually subjective and computation is highly costly. Image is simply a collection of pixels. It is quite difficult to extract the knowledge (the high level information) directly from the low-level pixel collection.properties as well as local spatial relationships, and results in a region map that is ready for further processing, e.g. regionmerging or labeling[7].

Feature Extraction

Feature extraction involves simplifying the amount of resources required to describe a large set of data accurately. When performing analysis of complex data one of the major problems stems from the number of variables involved. Analysis with a large number of variables generally requires a large amount of memory and computation power or a classification algorithm which overfits the training sample and generalizes poorly to new samples. Feature extraction is a general term for methods of constructing combinations of the variables to get around these problems while still describing the data with sufficient accuracy[8]

LITERATURE SURVEY

Various license plate detection algorithms have been developed in past few years. Each of these algorithms has their own advantages and disadvantages. Arth *et al*[1] described the method in which license plate is detected using confidence related predictions. As multiple detections are available for single license plate, post –processing methods are applied to merge all detected regions. Kwasnicka *at el*[2]. suggests a different approach of detection using binarization and elimination of unnecessary regions from an image. A method for license plate location based on the Gabor transform is presented in [3]. The results were encouraging (98% for LP detection) when applied to digital images acquired strictly in a fixed and specific angle, but the method is computationally expensive and slow for images with large analysis.

PROPOSED METHOD

The following steps describes the method.

Step 1: Read the image
Step 2: Convert the image type color image to gray scale image,
Step 3: Use Median filtering technique to remove noise.
Step 4: Finding the edge using sobel filter.
Step 5: Smoothing image to reduce the number of connected components.
Step 6: Calculate the connected components.
Step 7: Extract the the connected components .
Step 8: Store the extracted image in an array.

RESULTS

Hence the algorithm showed a good result on the Karnataka vehicle number plate. This algorithm is implemented by using Matlab 7.0. Below figures showing the input and output images after applying the proposed method.



Fig 1. Input Image



Fig2. Converted RGB to Gray scale image.

CONCLUSION

From this paper we can say the simple algorithm can also be useful in number plate extraction. And hence in future work we will move on to other image processing technique to improve the quality of the result and full number plate recognition.

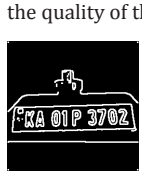


Fig 3.Output Image after Reducing the Connected Components.



Fig 4. Image after extraction.

REFERENCE

[1] Clemens Arth, Florian Limberger and Horst Bischof, "Real-Time License Plate Recognition on an Embedded DSP-Platform", Proceedings of IEEE conference on Computer Vision and Pattern Recognition, pp 1-8, June 2007. | [2] Halina Kwasnicka and Bartosz Wawrzyniak, "License plate localization and recognition in camera pictures", AI-METH 2002, November 13-15, 2002. | [3] F. Kahraman, B. Kurt, and M. Gökmen, "License plate character segmentation based on the gabor transform and vector quantization," in LectureNotes on Computer Science, vol. 2869, A. Yazici and C. Sener, Eds. New York: Springer-Verlag, 2003, pp. 381–388. | [4] Y. K. Siah, T. Y. Haur, M. Khalid, and T. Ahmad, "Vehicle licence plate recognition by fuzzy Art-map neural network," (Faculty of Electronic Engineering, University Teknologi Malaysia, Jalan Semarak, Kuala Lumpur), Centre for Artificial Intelligence and Robotics. | [5] M. Koga, T. Kagehiro, H. Sako, and H. Fujisawa, "Segmentation of Japanese handwritten characters using peripheral feature analysis," in International Conference on Pattern Recognition, (Brisbane, Australia), pp. 1137–1141, ICPR, August 1998. | [6] J. Mao, P. Sinha, and K. Mohiuddin, "A system for cursive handwritten address recognition," in International Conference on Pattern Recognition, (Brisbane, Australia), | pp. 1285–1287, ICPR, August 1998. | [7] Satish et al., " A study on Image Segmentation and its Methods" IJARCSSE 3(9), September - 2013, pp. 1112-1114. | [8] http:// en.wikipedia.org/ wiki/ Feature_extraction