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Review on Detection and Recoginition of Car Number Plate using Particle Swarm Optimization Algorithm

Miss. Nikita C. Tadas
PG Scholar(VLSI).
Dept of Electronics and Telecommunication Enng.
G. H. Raisoni college of Engg and Technology for Womens,
Nagpur, Maharashtra, India

***Abstract*: This paper mainly focused on PSO algorithm. Automatic car Number Plate Recognition and detection is a system that captures the image of car and recognizes their number plate. In this resource also developed a automatic fare collection application .Automatic car number plate detection and recognition can be assisted in the detection of car. In this research the design of new PSO algorithm is introduced to recognize the number plate. The system is implemented using MATLAB and various images processing sample. In this paper the car number plate image is obtained by the cameras. Here, we are using five phase for number plate detection and recognition.**

Keyword: Development Of PSO Algorithm, Number Plate Detection, Number Plate Recognition, Number Plate Localization, Fare Collection Application.

INTRODUCTION:

Number plate detection is one type of technology in world transportation systems. Number plate detection can be applied in many fields, such as security control, traffic monitoring, and automatic vehicle ticketing. In recent research it provides significant information to design artificial transportation systems for traffic management and analysis. In this project we are using PSO (particle swarm optimization).This techniques is to classified the number plate. The system is implemented using MATLAB and various image samples are taken by a camera and experimented with to verify the distinction of the proposed system. Motivated by the PSO it is one of the novel Number plate detection approaches for the complex all-day traffic environment. The number plate is an object, which consists of several fixed-size characters in specific spatial configurations. The PSO model is introduced to represent the relationship among the number plate characters. Finally, number plate locations are obtained with PSO inference. Dependencies of characters are modeled in probability distribution with PSO. The global optimal solution can be reached with local observations. PSO selects the optimum Number plate symbol depending on the input geometric relationship matrix (GRM) that defines the geometrical relationships between the symbol in the number plate. To search for the candidate objects and to allow for tolerance in the localization process, a PSO algorithm has been designed with a new function. Unlike in genetic algorithms, evolutionary programming and evolutionary strategies, in PSO, there is no selection operation. All particles in PSO are kept as members of the population through the course of the run. Even if sometimes, not all the characters are successfully extracted in Number plates sometimes, a correct inference result can be also obtained with the existing contextual information. The main contribution is to design automatic car number plate detection application and apply PSO to Number plate recognition. In addition, it is one specific PSO model for modeling characters in Number plate.

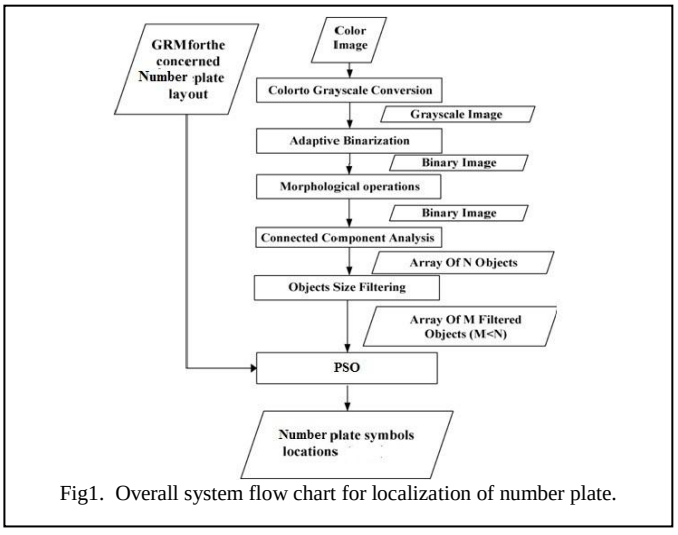

Fig1. Overall system flow chart for localization of number plate.

A. RESEARCH METHODOLOGY :

In the previous system number plates were localized based on genetic algorithm. This method is accurate but it takes a lot of time for processing of a single image. To remove this drawbacks and maintained good level of accuracy we proposed a PSO(particle swarm optimization) techniques with template matching .This will help us to provided high accuracy with better recognition capability so that we can get betters output with proper recognition and high speed classification. This will help us to develop an application for automatic car fare collection in car parking system. In this application first the car video will be taken and then in

time will be noted. Then for the conjunctive video if the same car numbers appears then out time will be note and proper fare will be collected. Figure below show the block diagram of detection & recognition of car number plate for automatic fare collection application. The detection process divided into four steps namely, image processing, development of PSO algorithm, Implementation of template matching, development of fare collection application. First of all, fixed-size images are extracted from the input image. They are regarded as candidate number plate characters. Next, the POS model is constructed. Candidates that satisfy certain neighborhood conditions are selected as observed nodes of POS. Meanwhile POS are use to detected the candidates characters. Maintaining the Integrity of the Specifications.The block diagram of software design for propose work is as shown in figure below.

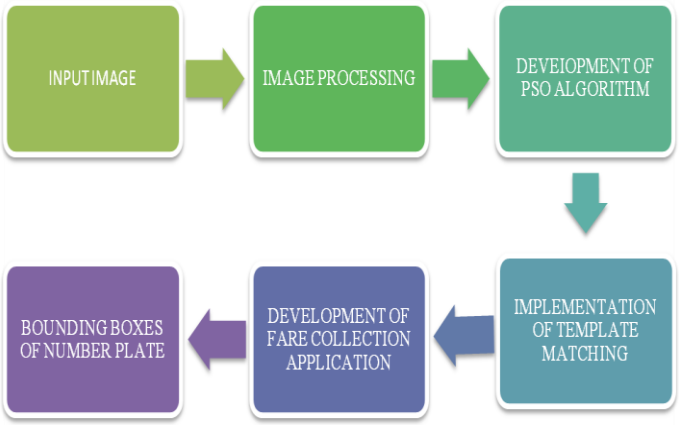

Fig 2: Software Architecture.

B. PREVIOUS WORK DONE :

[J. B. Kim, 2012, & W. Wang, 2011] described the clusters of connected components are searched by simple techniques, such as morphology and projection. It is noted that a similar character detection algorithm is also applied. [W. Zhou, H. Li, Y. Lu, & Q. Tian, 2012] proposed the principal visual words of characters and detects specific characters by local feature matching. [Y. Wen, Y. Lu, J.Yan, and P. Shi, 2011] described an alternative method for license plates without frames is presented. One hybrid algorithm is presented by edge statistics and morphology operation for highway ticketing systems. Texture-based methods mainly focus on the macroscopic distribution of pixel intensity in plate regions. [K.H. Lin, H. Ting, and T.S. Huang, 2010] proposed the saliency-related features are computed to segment license plate regions. [W. Jia, H. Zhang, X. He, and M. Piccardi, 2005, 2007] proposed Color-based methods take the prior knowledge of country-specific license plate colors into consideration. A mean-shift filter is applied to segment a one-color image into several candidate plate regions. These regions are continued to be classified by certain constraints to locate the license plates.

These three features have their own pros and cons, respectively. Thus, using hybrid features is a straightforward way to improve the performance of number plate detection. Recently, it has been popular and efficient to combine color information with other complementary features. Distinguished from these previous methods, considers number plates as objects that can be decomposed into characters with certain spatial and visual configurations. With the help of the PSO model, the structural features of Number plates are described by local contextual information among characters in probability distributions.

C. LITERATURE SURVEY:

[C.-N. E. Anagnostopoulos, 2008] describe that the large amount of license plate detection and the plate recognition from still images and video sequence methods can be roughly divided into three categories, namely, edge-based methods, texture-based methods, and color-based methods. [J. B. Kim, 2012, & W. Wang, 2011] described the clusters of connected components are searched by simple techniques, such as morphology and projection. It is noted that a similar character detection algorithm is also applied. [W. Zhou, H. Li, Y. Lu, & Q. Tian, 2012] proposed the principal visual words of characters and detects specific characters by local feature matching.

Edge-based approaches assume that regions with high edge density mean the presence of license plates. [H. Bai and C. Liu, 2004] proposed that one hybrid algorithm is presented by edge statistics and morphology operation for highway ticketing systems. [D. Zheng, Y. Zhao, and J. Wang, 2005] proposes an effective detection algorithm to search the regions with dense edges after the removal of noisy edges. [F. Faradji, A. H. Rezaie, and M. Ziaratban, 2007] proposes reliable morphological operators are applied to the results of vertical edge detection and histogram analysis. Edge-based methods are reliable when the background is not extremely cluttered, and the appearances of license plates are regular.

[K.-H. Lin, H. Tang, and T. S. Huang, 2010] proposes Texture-based methods mainly focus on the macroscopic distribution of pixel intensity in plate regions. The saliency-related features are computed to segment license plate regions. [Y. Lee, T. Song, B. Ku, 2010] proposes local structure pattern features and gets better detection performance. Texture features capture more discriminative characteristics than edge-based features. However, problems of edge-based methods still exist, such as detection in complex background and adaption to different appearances of license plates.

Color-based methods take the prior knowledge of country-specific license plate colors into consideration. [W. Jia, H. Zhang & X. He, 2005, 2007] proposed that the mean-shift filter is applied to segment a one-color image into several candidate plate regions. These regions are continued to be classified by certain constraints to locate the license plates. Although color features are suitable to detect deformed and blurred license plates, they are unstable and sensitive to illumination changes. Other objects with similar color and size of license plates may be detected as false positives.

D. CONCLUSION:

The conclusion is a novel PSO-based Number plate detection approach is proposed. The Number plate is regarded as one compositional object, which is decomposed into several characters. Meanwhile, these characters are arranged in specific spatial and visual configurations. MSERs are extracted as candidate characters and introduce a PSO model to describe the contextual relationship among the candidates. Finally, Number plates are located through the PSO inference. The experimental results show that this approach can achieve outstanding and robust detection performance, particularly under the all-day video surveillance environment.

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