VEHICLE LICENSE PLATE RECOGNITION USING DARK CHANNEL PRIOR ALGORITHM

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***Abstract*—Automatic license plate recognition and its use in many automotive applications make this process very easy. However, it can be very difficult to verify the vehicle license number, especially in some foggy areas. This is because the lines and symbols on the plate are deformed due to bad weather conditions and the plate becomes unreadable. To this end, this study provides a method for verifying license plates in the dark (LPRFH). A dark based method has been used in the past to remove blurry images for license recognition purposes. After additional de-blurring of the image, the license area is detected using a combination of de-blurring and area subtraction models based on known convolutional neural networks. Use a convolution-rich, super resolution convolutional neural network to generate a high resolution image and make it easier to distinguish license plates. The results are 95% accurate and up to date. Many studies have proven that these plates can be trusted to read plates even in the most extreme weather, weather and atmospheric conditions.**

Keywords*—Object Detection Convolutional Neural Network (ODCNN), License Plate Recognition Method for Fog Haze ,Dark channel prior algorithm

INTRODUCTION

Due to the rapid growth of the economy and the further expansion of cities, transportation has become an essential part of modern civilization. Intelligent Transportation Systems (ITS) claims to provide traffic management and transportation related services to easily manage large vehicles. Every vehicle in the world has a vehicle license number as an identifier and important steps for ITS. This license verification method is fully automatic. Therefor e, in a foggy environment, a smart transportation vehicle cannot recognize a vehicle license. License Plate Recognition (LPR) technology allows automatic vehicle identification. It is important to remember that certain environmental conditions (such as weather, lighting levels) can affect the visibility of the vehicle's license photo from the security cameras. Fog really distorts the lettering and framing of the license, making it difficult to se e and recognize the license, especially when the fog is more severe. Most current license plate authentication algorithms rely on removing features. Due to the effects of smoke an d blur on the image, the vehicle plate cannot be recognized based on these events. Cognitive behavior is also affected by the fog effect.

Fig 1: Vehicle license plate in fog environment

The frame provided by LPRFH technology includes resolution technology and image de-blurring technology. Object Detec tion Convolutional Neural Network (ODCNN) is the basis of the image hazing technique. Super resolution convolutional neural network is the basis of super resolution technology. The first is the dark channel before the process based on local estimation of atmospheric light. This value is initially used to de-blur the image. To reduce image backup distortion caused by the accumulation of many errors, images are further de-blurred and then license plate is extracted from these enhanced images using an object detection convolutional neural network. Finally, the improved SRCNN technique with six layer convolution for super resolution images improves the accuracy of license plate identification. Note that the detection Conv Nets in our study were trained on real and synthetic i mages, but SRCNN was trained on synthetic images as it collects invisible images of vehicles in motion from the environment.

CHALLENGES

There are still various problems with automatic license plate recognition systems. The most common challenge they face is the non-uniformity of license plate number models for different cities and countries. Their length may also vary. That's why the software must be customized to the place it's being used in.

RELATED WORKS

It was discovered that there are fewer accurate methods in the area based on the many strategies employed over the years. Consequently, a combination of many strategies might create the more secure data.

In McCartney[1], the issue of picture dehazing has been thoroughly investigated. proposes a model for atmospheric light scattering that is based on the Mie theory, and the imaging process uses both the incident light attenuation model and the atmospheric light imaging model.

An image is converted from low resolution (LR) to high resolution (HR) by a process called super resolution (SR). Deep convolutional neural networks (DCNNs) can produce optimal solutions and, in this case, blunt results. Develop deep learning rules using SRCNN. Dong et al. With this technique, one can learn to map high-resolution images end-to-end to low-resolution images. Using a variety of handcrafted filters, SRCNN improves the resolution of image distortion. This process optimizes all layers rather than focusing on individual components. An excellent method for a super resolution image is presented in [2].

They form a stronger network. The deep web is built on SRCNN with 20 layers to learn. This method is more effective than others. To retrieve the content [3] introduced SRGAN, a neural network (GAN) for super-resolution (SR) images. The frame is able to focus on beautiful images of four events.

Behavior recognition is based on behavior segmentation. Reference [6] describes a character segmentation process that uses prior knowledge to identify characters and perform character segmentation based on relevance. In addition to the license, segmentation characters are also used to write segmentation.

A new character tagging system has been proposed by Jun et al. [7] and based on nonlinear groups. After dividing the entire text into several strokes, first calculate the similarity matrix. The nonlinear clustering technique is then used to generate labels for the ships. Group strokes together to create characters based on group names.

In [8], Roy et al. It describes an end-toend real-time solution for real-world digital data processing.

[9] proposed a deep learning-based segmentation-free system for license plate recognition using behavior analysis and recognition. Improves low resolution image viewing results

PROPOSED METHODOLOGY

A. Framework of the LPRFH

An architecture that uses both image blur removal and super resolution techniques. The core of image defogging technology is object detection convolutional neural network. The super resolution technique is based on super resolution neural networks. The first is a dark channel based on local measurement of light intensity. The image is initially blurred using this value. The images are then de-blurred and slabs are restored from these enhanced images using object detection convolutional neural networks to reduce image distortion due to mis-combination of many things. Super-resolution image technology is used by 6-layer convolution-enhanced SRCNN to improve the accuracy of license plate recognition. Note that the object detection ConvNets in our study were trained on both real and synthetic images, but SRCNN was trained on synthetic images because invisible images of vehicles in motion were collected at the real site. Due to the effects of fog and blur on the image, most current license plate identification algorithms rely on feature extraction, which cannot accurately identify the license plate under certain conditions.

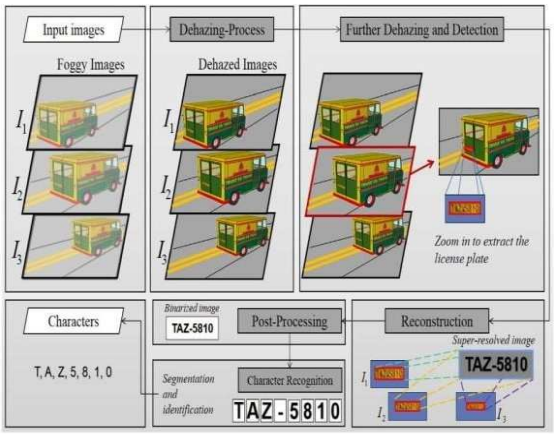


Fig 2: LPRFH Frame

work B Dark cahnnel prior algorithm

The atmospheric scattering model is frequently used for image dehazing. The image is approximatively damaged by air scattering:

$$I(x)=j(x) .t(x) + A . [1 –t(x)]$$

The colour channel is referred to as a dark channel when its minimum(min) intensity value is very near to zero in the majority of local locations of a picture .Regarding a source picture J, its dark channel.

C. JFRM Frame work

Be careful to see the permission more accurately when the weather is foggy The JFRM network model is a multi-optimized mesh, which we have added some filters to create more features. We mix convolutional and layered layers to compensate for data loss during convolution. In this way, the boundary properties of the object can be captured, the explosion and explosion problem can be solved and the training speed can be accelerated.

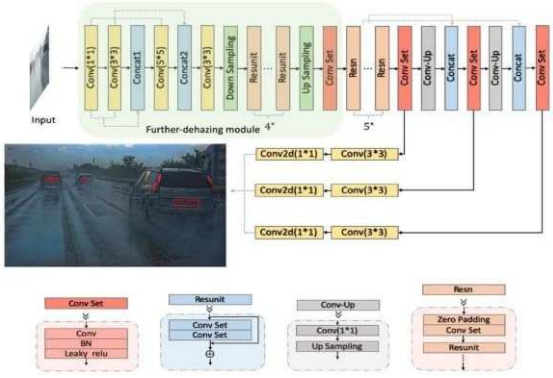


Fig 3 : JFRM Frame work

Intelligent Transportation Systems (ITS) claims to provide traffic management and transportation decision-making services to help manage traffic volumes. In foggy conditions, the license plate recognition technology is fully automatic. Incorrect bounding box for swash plates. This is because the

JFRM network only generates rectangular boxes without considering spatial transformation. Therefore, it can be used to identify non-rectangular areas.

Fig 4: License plate character segmentation

The image blur problem has attracted a lot of attention. Atmospheric light scattering model based on Mies scattering theory has been proposed. This model is used in conjunction with the atmospheric illumination model for the illumination problem and display mechanism of light attenuation. The fogging method proposed by Heetal is based on the dark channel, based on the light model and the dark objects removal model, at least one color channel algorithm, some with lower pixel usage. Create models that eliminate fog and haze, along with Random Forest to calculate exposure. Instead, the model combines darkness, maximum local contrast, color contrast, and maximum local saturation.

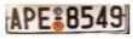
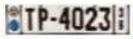
Original images	SRCNN	Convolution-enhanced SRCNN
		
		
		
		
		

Table 1: Comparison of the images in super resolution reconstruction result

In fog and haze, licence plates can be recognised correctly. Additionally, with relation to a slanted licence Consequently, it is possible to output the non-rectangular bounding box. Meanwhile, even when there are stains on the licence plates, the precision of the recognition can be ensured.

CONCLUSION

This experiment explores how challenging it is to read licence plates in hazy and foggy weather. In order to reduce the fog-haze interference in an image, a fog concentration de-hazing method is first investigated. In the proposed JFRM network, the further de-hazing detection is jointly optimised, which significantly reduces the distortion of image reconstruction caused by the cumulative errors and accurately extracts the licence plates from the preliminary de-hazed images. In order to correctly identify the characters on licence plates, the image is super-resolved using a convolution-enhanced SRCNN. Our method can improve the accuracy of vehicle licence plate recognition in hazy conditions, according to simulation results. Future studies will concentrate on enhancing the transmission maps in the dehazed pictures.To acquire the ideal bounding box, we will also research an adaptive setting of the IOU threshold in the non-maximum suppression technique.

ACKNOWLEDGMENT

The author would like to thank all the anonymous reviewers for their helpful suggestions and comments that will help in improving this paper.

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