© 2023 IJCRT | Volume 11, Issue 5 May 2023 | ISSN: 2320-2882

IJCRT.ORG

ISSN: 2320-2882



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

"Traffic Sign Detection and Recognition Using Deep Learning"

Vaishnav Patil, Vaishnav Shinde, Aniket Shelar, Kiran Shelke

Prof-Richa Agarwal

Trinity College of Engineering and Research

Abstract

Road signs are important to ensure smooth traffic flow without bottle necks or mishaps. Road symbols are the pictorial representations having different necessary information required to be understood by driver. Road signs in front of the vehicle are ignored by the drivers and this can lead to catastrophic accidents. This paper presents an overview of the traffic sign board detection and recognition and implements a procedure to extract the road sign from a natural complex image, processes it and alerts the driver using voice command It is implemented in such a way that it acts as a boon to drivers to make easy decisions

I. INTRODUCTION

Traffic signs are road facilities that convey, guide, restrict, warn, or instruct information using words or symbols. With the development of automotive intelligent technology, famous car companies, such as Mercedes-Benz, BMW, etc., have actively invested in ADAS (Advanced Driver Assistance System) research. Commercialized ADAS systems not only include Lane Keep Assist Systems, but also include TSR (Traffic Sign Recognition) systems to remind drivers to pay attention to the speed. If drivers and pedestrians do not notice this information, it can lead to the occurrence of traffic accidents. With the increasing demand for the intelligence of vehicles, it is extremely necessary to detect and recognize traffic signs automatically through computer technology.

In this article, we have developed a robust system that can predict traffic signs using CNN. To make them easy for drivers to read and recognize, traffic signs are often designed to be of a particular shape and colour with symbols inside, so that there is a significant difference between the traffic signs and the background.

LITERATURE REVIEW

Paper Name: : A Traffic Sign Detection Algorithm Based on Deep Convolutional Neural Network

Author name : Xiong Changzhen, Wang Cong, Ma Weixin, Shan Yanmei

Abstract :- Traffic sign detection plays an important role in driving assistance systems and traffic safety. But the existing detection methods are usually limited to a predefined set of traffic signs. Therefore we propose a traffic sign detection algorithm based on deep Convolutional Neural Network (CNN) using Region Proposal Network(RPN) to detect all Chinese traffic sign. Firstly, a Chinese traffic sign dataset is obtained by collecting seven main categories of traffic signs and their subclasses. Then a traffic sign detection CNN model is trained and evaluated by fine-tuning technology using the collected dataset. Finally, the model is tested by 33 video sequences with the size of 640×480. The result shows that the proposed method has towards real-time detection speed and above 99detection precision.

Paper Name :- A Traffic signs' Detection Method of Contour Approximation based on Concave Removal

Author name: Xu Zhe1 , Ren Jingyi1 , Bao Chaoqian.

Abstract:- :In this paper, a simple and efficient algorithm for detecting deformed and occlusion triangular and circular traffic signs under complex natural scenes is proposed. Firstly, the image is segmented and binarized. Then the convex hull of every contour extracted from the binarized image is calculated. Some concave part of a contour is removed and is replaced by the corresponding convex edge of the convex hull. After that, the contour is approximated to a polygon. Finally, Those contours which can be succeed to approximated to a triangle is the triangular traffic signs, and other contours approximation which can be approximated to a ellipse with random least squares fitting is the circular traffic signs. The experimental results shows the detection rate reaches 86.79%, this algorithm can handle the adverse influence of traffic signs' deformation, occlusion better than hough method.

Paper Name: Using Mobile Lidar Point Clouds For Traffic Sign Detection And Sign Visibility Estimation

Author name: Shuang Wu1 , Chenglu Wen1*, Huan Luo

Abstract : :This paper presents a novel method for traffic sign detection and visibility evaluation from mobile Light Detection and Ranging (LiDAR) point clouds and the corresponding images. Our algorithm involves two steps. Firstly, a detection algorithm based on high retro-reflectivity of the traffic sign from the MLS point clouds is designed for sign detection in complicated road scenes. To solve the spatial features of traffic signs, we also create geo-referenced relations between traffic signs and roads according to the normal of ground.

Paper Name: Automatic Detection a nd Recognition Of Traffic Signs Author : Carlos Filipe Paulo, Paulo Lobato Correia;

Abstract : This paper proposes algorithms for the automatic detection of traffic signs from photo or video images and their classification to provide a driver alert system. Several examples taken from Portuguese roads are used to demonstrate the effectiveness of the proposed system. Traffic signs are detected by analyzing color information, notably red and blue, contained on

the images. The detected signs are then classified according to their shape characteristics, as triangular, squared and circular shapes. Combining color and shape information, traffic signs are classified into one of the following classes: danger, information, obligation or prohibition. Both the detection and classification algorithms include innovative components to improve the overall system performance.

Paper Name: Fast Traffic Sign Detection under Challenging Conditions Author: Bao Trung Nguyen , JaeRyong, Shim.

Abstract: In recent years, a lot of researches on traffic sign detection and recognition have been done. But most of them were tested under restricted conditions such as camera with high resolution and sensitivity, highway environment or road side having a lot of trees and very few distracting objects. In this paper, we present a fast and robust traffic sign detection system including two main stages: segmentation and detection. To boost the reliability of system, a flexible segmentation stage is designed, which includes double segmentation, one with higher criteria and the other with lower criteria, to reliably cut down a great computation burden for the shape-based detection.



Admin

In this module, the admin has to log in by using valid user name and password. After login successful he can do some operations such as View All Users and Authorize.

View and Authorize Users

In this module, the admin can view the list of users who all registered. In this, the admin can view the user's details such as user name and admin authorizes the users.

End User

In this module, there are n numbers of users are present. User should register before doing any operations. Once user registers, their details will best or to the database. After registration successful he has to login by using authorized user name and password. Once Login is successful user will be able to use the traffic sign detection and recognition system.





Output 1



Output 3

www.ijcrt.org



Output 4



Output 6



Output 7 II. CONCLUSION

We propose a smart driver alert system which detects and recognizes traffic signboard from video stream input and gives voice message to the driver. By using this technology. We can reduce the road accidents as well as regulate traffic safely. a system that is able to detect and classify a set of 28 traffic signs in different environments. The results are moderate and it can be improved by testing different neural network structures. As a neural network is often called a black box, there is no guarantee that it will perform best with the defined set. Real-time detection and recognition can also be implemented in the future.

III. References

[1] Zhong LIU, Weihai CHEN, Yuhua ZOU and Cun HU "Regions of Interest Extraction Based on HSV Color Space," IEEE 10th International Conference on Industrial Informatics, July 2012.

[2] Dept. Transp., London, U.K., Traffic Signs Image Database, 2011.

[3] Jack Greenhalgh and Majid Mirmehdi "Real-Time Detection and Recognition of Road Traffic Signs," IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS, VOL. 13, NO. 4, DECEMBER 2012.

[4] Jung-Guk Park, Kyung-Joong Kim "A METHOD FOR FEATURE EXTRACTION OF TRAFFIC SIGN DETECTION AND THE SYSTEM FOR REAL WORLD SCENE," IEEE International Conference on Emerging Signal Processing Applications, 12-14 Jan2012.

[5] Sungho Kimh and Soon Kwon "Improvement of traffic sign recognition by accurate ROI refinement," 15th International Conference on Control, Automation and Systems (ICCAS 2015) Oct. 13-16, 2015 in BEXCO.

[6] Hurriyatul Fitriyah, Edita Rosana Widasari, Gembong Edhi Setyawan "Traffic Sign Recognition using Edge Detection and Eigen-face," International Conference on Sustainable Information Engineering and Technology (SIET), 2017.

[7] H. Fleyeh, E. Davami "Eigen-based traffic sign recognition," IET Intelligent Transport Systems (Volume: 5 Issue: 3 September 2011).

[8] Ioan Cristian Schuszter "A Comparative Study of Machine Learning Methods for Traffic Sign Recognition," 19th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC), 2017.

[9] David Soendoro, Iping Supriana "Traffic Sign Recognition with Color-based Method, Shape-arc Estimation and SVM," International Conference on Electrical Engineering and Informatics 17-19 July 2011.

^[10] ongqiang Qian, Bailing Zhang, Yong Yue and Frans Coenen "Robust Chinese Traffic Sign Detection and Recognition with Deep Convolutional Neural Network," 11th International Conference on Natural Computation (ICNC), 2015.

[11] Md. Abdul Alim Sheikh, Alok Kole and Tanmoy Maity "Traffic Sign Detection and Classification using Colour Feature and Neural Network," International Conference on Intelligent Control Power and Instrumentation (ICICPI), 2016.

[12] Tiago Moura, Antonio Valente, Ant ' onio Sousa, V ' 'itor Filipe "Traffic Sign Recognition for Autonomous Driving Robot," IEEE International Conferenceon Autonomous Robot Systemsand Competitions(ICARSC) May14-15, 2014.

[13] Jia Shijie, Wang Ping, Jia Peiyi, Hu Siping "Research on Data Augmentation for Image Classification Based on Convolution Neural Networks," Chinese Automation Congress (CAC), January 2018.

[14] szka Mikołajczyk, Michał Grochowski "Data augmentation for improving deep learning in image classification problem," International Interdisciplinary PhD Workshop (IIPhDW), 2018.

[15] Prashengit Dhar, Md. Zainal Abedin, Tonoy Biswas1, Anish Datta "Traffic Sign Detection- A New Approach and Recognition Using Convolution Neural Network," IEEE Region 10 Humanitarian Technology Conference (R10-HTC) 21 - 23 Dec 2017, Dhaka, Bangladesh.