STOP SIGN DETECTION USING DEEP LEARNING

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Abstract: Stop signs are the primary form of traffic control in the Country . However, they have a tendency to be much less effective than other forms of traffic control like traffic lights. This is due to their smaller size, lack of lighting, and the fact that they may become visually obscured from the road. In this paper, we offer a solution to this problem in the form of a detector. It is designed to alert a driver when they are approaching a stop sign using a voice notification system (VNS). A field test was performed in a snowy environment. The test results demonstrate that the application can detect all of the stop signs correctly, even when some of them were obstructed by the snow, which in turn greatly improves the user awareness of stop signs.

Acknowledgement of traffic signs vary significantly in numerous applications, for example, in self-driving vehicle/driverless vehicle, traffic planning and traffic observation. Traffic Sign Recognition (TSR) framework is a segment of Driving Assistance System (ADAS). This research work has developed a YOLOV3 model to identify the stop signs present in the image given by user. The darknet algorithm is used in the YOLOV3 model, which has a pre- trained dataset. The framework helps drivers in safe driving by providing significant data from street signs. The automobile industry has grown significantly, and some companies are aiming to build self-contained automobiles, with stop sign recognition being one of the most important elements to consider.

Index Terms: YOLO V3, STOP SIGN

I. INTRODUCTION

Deep learning emerges to be the most successful subset of machine learning in solving problems related to image classification and identification. The achievement of deep learning in the field of self-driving cars is unequivocal. The proposed research work focuses around stop sign detection. A traffic in alone can convey a whole lot of information to the street clients. It is significantly important to develop a reliable automatic traffic sign detection system.

With the ascent of technological development, vehicles became an important portion of in our routine lives. As a result of driving vehicles while not follow traffic rules, it creates additional and additional complex traffic on the road. As a result, it's each of} the most important reasons behind accidents every year. In recent times road accidents square measure happening often in increasing manner across the globe. Leading reason of most road accidents is that the content or unconsciousness of the traffic sign. That means of traffic sign is any entity, device, or board on the road that entity carries the principles, indicates the warning or provides alternative rationalization concerning driving

Stop signs square measure the first type of control within the Country as a result of they're cheap and straightforward to take care of compared with different styles of control like traffic lights. Close to one third of all transport accidents occur in stop sign controlled intersections that appears affordable considering that a majority of intersections use them. However, these accidents account for over four-hundredth of all fatal transport accidents. analysis performed by the u. s. Department of Transportation (USDOT) has shown that the first reason for this improbably high variety is because of driver inability or failure to check the stop sign, leading to a collision.

This inability to visualize the stop sign is usually caused by visual obstructions. Some samples of visually plugged stop signs ar shown in Figure one. These obstructions is also caused by plant overgrowth, frost, graffiti, put cars, hills, and plenty of alternative reasons. it absolutely was determined that the explanation for such a high frequency was as a result of poor placement of the stop sign, that madenit troublesome to visualize from the road. If the first reason that drivers accidentally run stop signs is as a result of they merely don't see them, a straightforward answer is to use another technique to convey the presence of an forthcoming stop sign. During this paper, we have a tendency to gift a unique answer, for safe drivers UN agency need to make sure that they are doing not accidentally miss a stop sign. The first style goal is to warn the user concerning forthcoming stop signs on the road in period of time to enhance the driving safety.

Figure 1

II. PROPOSED SYSTEM

The aim of planned system is to develop a system of improved facilities. The planned system will overcome all the restrictions of the prevailing system. the prevailing system has many disadvantages and lots of additional difficulties to figure well. The planned system tries to eliminate or cut back these difficulties up to some extent. The planned system can facilitate the user to cut back the road accidents. This planned system has developed a YOLOV3 model to spot the stop signs gift within the image given by user and additionally give a voice alert. The darknet rule is employed within the YOLOV3 model, that contains a pre- trained dataset. The framework helps drivers in safe driving by providing important information from street signs.

1) Data collection and pre-processing

The data consist of 3 features,

- Shape
- Color
- Optical character recognition

2) Software and hardware requirements

System requirements are the configuration that a system must have in order for a hardware or software application to run smoothly and efficiently.

**Software Requirements**
- Anaconda- Spyder .
- Python

Hardware Requirements
- Processor : Intel i3 or above
- Memory : 8GB RAM
- Hard Disk Drive : 4 GB for ANDROID,4-8 GB for a typical installation

III. METHODOLOGY

Initially, data is collected in the form of images. The images will be pre-processed and trained before being used. It builds a YOLOV3 model. After that, the pre-processed data is passed into the YOLOV3 model. Then detection takes place, it detects traffic signs.

IV. ARCHITECTURE DIAGRAM
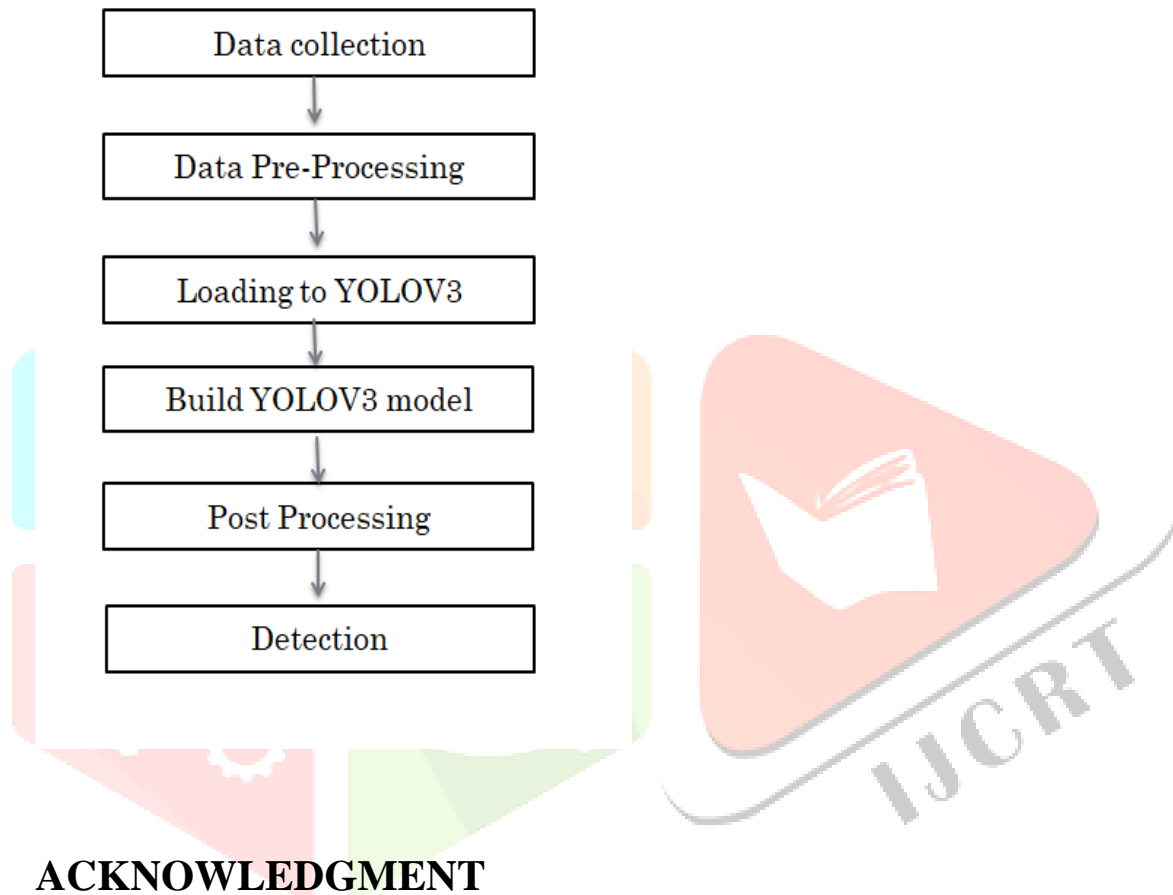
V. ACKNOWLEDGMENT

VI. CONCLUSION

This paper study was to represent an original effective stop sign detection and recognition approach. In this study, it is done using darknet algorithm to decline stop sign difficulties. In our experiment we obtained highest accuracy 99%. We showed the real time evaluation

result is 98%. In future, our aim is to increase the number of traffic signs classes with large amount of quality data.

REFERENCES

[1] P. Sermanet and Y. LeCun, "Traffic sign recognition with multi-scale convolutional networks," in Neural Networks (IJCNN), The 201 International Joint Conference on. IEEE, 2011, pp. 2809–2813.

[2] L. Tao and V. Asari, "An integrated neighborhood dependent approach for nonlinear enhancement of color images," in Information Technology: Coding and Computing, 2004. Proceedings. ITCC 2004. International Conference on, vol. 2. IEEE, 2004, pp. 138–139.

[3] A.Vennelakanti, S. Sherya, R. Rajendran, D. Sarkar , D. Muddegowda and P.Hanagal " Traffic Sign Detection and recognition using a CNN Ensemble" 2019 IEEE International Conference on Consumer Electronics(ICCE),2019

[4] S. Song ,Z.Que, J.Hou,S.Du and Y.Song . "An efficient convolutional neural network for small traffic sign detection ",Journal of systems Architecture,vol 97,2019

[5] https://www.section.io/engineering-education/detect-stop-traffic-deep-rcnn-in- matlab/

[6] https://www.ijert.org/research/traffic-sign-recognition-using-machine-learning-a- review-IJERTV10IS050422.pdf

[7] https://www.hindawi.com/journals/ijvt/2012/532568/

[8] https://driving-tests.org/road-signs/stop-sign/