

Real Time Indian Traffic Sign Detection using Image Processing and CNN

Chandan R Hegde¹ and Manjunatha H T²

Student, Department of Computer Application¹

Assistant Professor, Department of Computer Application²

Jawaharlal Nehru New College of Engineering, Shimoga, Karnataka, India

chandanhegde250799@gmail.com and manjudeepa@jnnce.ac.in

Abstract: *Driver Assistance and Monitoring System plays a very important role in traffic management especially in Indian roads. It eventually reduces the accidents and major injuries. DAMS (Driver Assistance and Monitoring System) give the safety and driving comfort. The main motto of our work is to design the effective methodology for the assistance and driver monitoring system which alerts the driver when it detects the road signs so that driver can take the appropriate action. The proposed methodology detects a road signs which is present in the dataset under cluttered background and different lighting conditions. The proposed work detecting the road sign based on colour and shape. The edge of the road sign is detected using canny edge operator. The images are enhanced and removed the noise using median filters. The images are classified as stop, no entry, speed limit using Convolutional Neural Network (CNN) classifier.*

Keywords: TSR (Traffic Sign Recognition), DAS (Driver Assisting System), Convolutional Neural Network (CNN)

REFERENCES

- [1]. Rubén Laguna*, Rubén Barrientos*, L. Felipe Blázquez*, Luis J. Miguel**. “Traffic sign recognition application based on image processing techniques”
- [2]. Danyah A. Alghmghama, Ghazanfar Latif^{a, b*}, Jaafar Alghazo^a, Loay Alzubaidi^a. “Autonomous Traffic Sign (ATSR) Detection and Recognition using Deep CNN” - 16th International Learning & Technology Conference 2019
- [3]. Prof. Chhaya Narvekar#1, Shubham Yadav#2, Saiprasad Rane#3, Anuj Patwa#4. “Indian Traffic Signboard Recognition and Driver Alert System Using Machine Learning” - international journal of information and computing science ISSN NO: 0972-1347
- [4]. Ying-Chi Chiu¹, Huei-Yung Lin^{1a} and Wen-Lung Tai². “A Two-stage Learning Approach for Traffic Sign Detection and Recognition”
- [5]. Priyanka A. Nikam¹, Nitin B. Dhaigude². “road sign symbol detection and recognition”
- [6]. E. Ramalakshmi¹, A. Gowthami Radha² & Haswika Bommen³. “Indian Sign Board Detection and Recognition for Driving Assistance” - AEGAEUM JOURNAL Volume 8, Issue 6, 2020 ISSN NO: 0776-3808
- [7]. Sudha S. K, Mahathi L. “A Real-Time System for Detection and Recognition of Traffic Signs” - International Journal of Engineering Research & Technology (IJERT) ISSN: 2278-0181 Published by, www.ijert.org NCETET - 2016 Conference Proceedings
- [8]. G.Revathi Dr.G.Balakrishnan. "Indian Sign Board Recognition Using Image Processing Techniques" International Journal of Advanced Research in Biology Engineering Science and Technology (IJARBEST) Vol. 2, Special Issue 15, March 2016
- [9]. Manjunatha HT and AjitDanti. “A Novel Approach for Detection and Recognition of Traffic Signs for Automatic Driver Assistance System Under Cluttered Background” - Recent Trends on Image Processing and Pattern Recognition, Springer Nature Singapore, Pte Ltd. 2019, RTIP2R 2018, CCIS 1035, pp. 1–8, 2019, ISBN 978-981-13-9181-1 DOI -https://link.springer.com/chapter/10.1007/978-981-13-9181-1_36.
- [10]. Manjunatha HT and Ajit Danti. “Detection and Classification of Potholes in Indian Roads using Wavelet Based Energy Modules” - IEEE- 978-1-5386-9319-3/19 © 2019 ,SCOUPS Nature

- [11]. Manjunatha HT, Ajit Danti, Arunkumar KL, Rohith D” Indian Road Lanes Detection Based on Regression and clustering using Video processing Techniques”, 3rd International Conference on Recent Trends in Image Processing and Pattern Recognition (RTIP2R,2020). Dr. Babasaheb Ambedkar Marathwada University, Aurangabad. Springer, Scopus Indexed 3rd and 4th January 2020. Springer Nature Singapore Pte Ltd. 2021 K. C. Santosh and B. Gawali (Eds.): RTIP2R 2020, CCIS 1380, pp. 1–14, 2021. https://doi.org/10.1007/978-981-16-0507-9_17
- [12]. Manjunatha HT and AjitDanti,” Indian traffic sign board recognition using Normalized Correlation Method”, International Journal of Computer Engineering and Applications (IJCEA), Volume XII, Issue III, March 18, ISSN 2321-3469
- [13]. Manjunatha HT and AjitDanti, “Segmentation of Traffic Sign Board in a cluttered background using Using Digital Image Processing”, National Conference on Network Security, Image Processing and Information Technology, March 2017.
- [14]. K L Arunkumar and Ajit Danti. H T Manjunatha, D Rohith “Classification of Vehicle Type on Indian Road Scene Based on Deep Learning”: Recent Trends on Image Processing and Pattern Recognition, Springer Nature Singapore Pte Ltd. 2021, RTIP2R 2020, CCIS 1380, Springer, pp. 1–10, 2021.
- [15]. Arunkumar K L, Ajit Danti, Manjunatha H, "Classification of Vehicle Make Based on Geometric Features and Appearance-Based Attributes Under Complex Background" , Springer 1035 (CCIS), pp 41-48
- [16]. K L Arunkumar, Ajit Danti, "a novel approach for vehicle recognition based on the tail lights geometrical features in the night vision", International Journal of Computer Engineering and Applications, Volume XI
- [17]. Manjunatha HT, Arunkumar K L, Ajit Danti, "A Novel Approach for Detection and Recognition of Traffic Signs for Automatic Driver Assistance System Under Cluttered Background", Springer 1035 (CCIS), pp 407-419
- [18]. KL Arunkumar, A Danti, HT Manjunatha, "Estimation of vehicle distance based on feature points using monocular vision", IEEE 8816996 (2019), 1-5
- [19]. KL Arunkumar, A Danti, HT Manjunatha, D Rohith, "Classification of Vehicle Type on Indian Road Scene Based on Deep Learning", Springer, Singapore 1380 (2021), 1-10
- [20]. HT Manjunatha, A Danti, KL ArunKumar, D Rohith, “Indian Road Lanes Detection Based on Regression and clustering using Video Processing Techniques”, Springer, Singapore 1380 (CCIS), 193-206
- [21]. Arunkumar K L, Ajit Danti, “Recognition of Vehicle using geometrical features of a tail light in the night vision, National Conference on Computation Science and Soft Computing (NCCSSC-2018)
- [22]. Manjunatha HT and AjitDanti. “A Novel Approach for Detection and Recognition of Traffic Signs for Automatic Driver Assistance System Under Cluttered Background” - Recent Trends on Image Processing and Pattern Recognition, Springer Nature Singapore, Pte Ltd. 2019, RTIP2R 2018, CCIS 1035, pp. 1–8, 2019, ISBN 978-981-13-9181-1
- [23]. Manjunatha HT and Ajit Danti. “Detection and Classification of Potholes in Indian Roads using Wavelet Based Energy Modules“, IEEE- 978-1-5386-9319-3/19 © 2019
- [24]. Manjunatha HT and AjitDanti,” Indian traffic sign board recognition using Normalized Correlation Method”, International Journal of Computer Engineering and Applications (IJCEA), Volume XII, Issue III, March 18, ISSN 2321-3469
- [25]. Manjunatha HT and AjitDanti, “Segmentation of Traffic Sign Board in a cluttered background using Using Digital Image Processing”, National Conference on Network Security, Image Processing and Information Technology, March 2017.