Automatic Speed Control of Vehicles Based on Signboard Recognition

Prof. Sharad Patil[1], Mr. Mayur Patil[2], Ms. Shraddha Jadhav[3], Ms. Pratiksha Tithe[4], Ms. Soniya Nigade[5]

Head, Department of Electrical Engineering, NBNSSOE Ambegaon Bk Pune[1]

Student, B.E. in Electrical Engineering, NBNSSOE Ambegaon Bk Pune[2,3,4,5]

Abstract: *The system proposed in this paper is an advanced solution for automatic speed control of vehicles based on speed limit signboard recognition. The technology behind this system is image processing technique which is used in manyfields such as space exploration, medicine, geology, etc. The main objective of this paper is to demonstrate the ability of image processing algorithms on embedded computing platforms. It describes a road sign recognition system based on an embedded system that reads and recognizes speed signs and also controls the speed of the moving vehicle. The paper also describes how to deal with numbers using image processing techniques based on shape and dimension analysis. Colour analysis plays an important role in road sign detection. Visual Studio, an embedded computing platform, and Arduino Uno are the main components to implement this system, as they have built-in capabilities. this is a computer vision-based system for traffic sign detection, tracking, and recognition in real-time. The signs on the roadside are captured with the help of a camera interface. The captured image is then compared with pre-defined road signs or preset algorithms. Dimension analysis is performed with the help of the K nearest algorithm. Upon obtaining the best match, the corresponding speed limit in the detected image will be sent to the visual studio that runs python code, Arduino will generate a pulse width modulated signal to control the speed of the vehicle (DC Motor) accordingly with the help of motor driver L298N.*

Keywords: Arduino Uno, Python, DC Motors, L298N, Visual Studio, Traffic Sign Detection, etc.

REFERENCES

[1] Rafael C. Gonzalez, Richard E. Woods & Steven L. Eddins, "Digital Image Processing usingMATLAB", Second Edition, - Pearson Education.

[2] Safat B. Wali, Mahammad A. Hannan, Aini Hussain, & Salina A. Samad "An Automatic Traffic Sign Detection and Recognition System Based on Colour Segmentation, Shape Matching, and SVM" Hindawi Publishing Corporation Mathematical Problems in Engineering Volume 2015, Article ID 250461

[3] https://en.wikipedia.org/wiki/Microsoft_Visual_Studio

[4] https://www.embedded.com/go-to-the-source-at-opencv-org/

[5] https://blog.amt.in/index.php/2021/10/07/introduction-to-arduino-uno

[6] https://components101.com/modules/l293n-motor-driver-module

[7] http://www.nex-robotics.com/products/motors-and-accessories/300-rpm-side-shaft-heavy-duty-dc-gear-motor.html