UNIVERSITI TEKNOLOGI MARA

A REAL-TIME SPEED LIMIT SIGN RECOGNITION SYSTEM FOR AUTONOMOUS VEHICLE USING SSD

NOR SYAHIRAH BINTI SAHARUDIN

BACHELOR OF COMPUTER SCIENCE (Hons.)

JULY 2020

Universiti Teknologi MARA

A Real-Time Speed Limit Sign Recognition System for Autonomous Vehicle using SSD

Nor Syahirah Binti Saharudin

Thesis submitted in fulfilment of the requirements for Bachelor of Computer Science (Hons.) Faculty of Computer and Mathematical Sciences

July 2020

SUPERVISOR APPROVAL

A REAL-TIME SPEED LIMIT SIGN RECOGNITION SYSTEM FOR AUTONOMOUS VEHICLE USING SSD

By

NOR SYAHIRAH BINTI SAHARUDIN
2017412148

This thesis was prepared under the supervision of the project supervisor, Nur Nabilah binti Abu Mangshor. It was submitted to the Faculty of Computer and Mathematical Sciences and was accepted in partial fulfilment of the requirements for the degree of Bachelor of Computer Science.

Approved by

……...

Nur Nabilah binti Abu Mangshor
Project Supervisor

JULY 10, 2020

STUDENT DECLARATION

I certify that this thesis and the project to which it refers is the product of my own work and that any idea or quotation from the work of other people, published or otherwise are fully acknowledged in accordance with the standard referring practices of the discipline.

……

NOR SYAHIRAH BINTI SAHARUDIN

2017412148

JULY 10, 2020

ABSTRACT

In today's technology-driven world, there are a lot of devices or product have been invented where one of it is an autonomous vehicle. As the vehicle is driverless, a lot of systems and sensors must be embedded to make sure it operates finely. Traffic Sign Recognition (TSR) is one of the systems needed. As the number of vehicles on the road kept increasing over the years, road accident has been a major problem throughout the world indicating speeding as one of the main causes. This project aims to develop a system capable of performing a real-time speed limit sign recognition but only specific to five speed limits. Image processing technique is used to develop the system where a single layer network called Single Shot Multibox Detector (SSD) is used to detect and recognize the speed limit signboard and for the dataset, a German Traffic Sign Dataset (GTSD) is used. An accuracy testing using confusion matrix is conducted to find the accuracy of the system. The system achieves over 70% of the accuracy for detection and recognition of the signboard. For future works, an alert sound can be implemented when the speed limit is recognized but the speed of the car is faster than the speed detected on the signboard where the help of Global Positioning System (GPS) will be needed.