

ABSTRACT

Traffic sign classification is one of the crucial aspects of the Autonomous Driving System (ADAS). This system helps vehicles to accurately recognize and respond to traffic sign sharing. Using the Convolutional Neural Network (CNN) model, it can identify and classify traffic signs based on imagery taken from cameras attached to vehicles. Therefore, this study proposes a Convolutional Neural Network (CNN) model of the ResNet50 architecture to help the development of autonomous driving systems. The ResNet50 is capable of handling the complexity and variation of traffic sign images with high accuracy, allowing the Autonomous Driving System to make informed driving decisions in real-time. The data used in this study is the German Traffic Sign Dataset (GTSDB) with high performance and develops model performance by adjusting hyperparameters. The data from GTSDB, which consists of 4 basic classes, namely prohibitory, mandatory, danger, and other, is processed and divided into training data, validation data for the model training process, and test data to test the best model. The hyperparameters used in the development of model performance are dropout, batch size, and learning rate. The results show that the ResNet50 model can have a test accuracy performance of 98,55%, precision 98.40%, recall 98.10%, and f1-score 98.21%. With the use of 0.1 dropout hyperparameter; batch size 8; and learning rate 0.0001. This shows that the ResNet50 model can have good performance for traffic sign image classification if the hyperparameters used are the same.

Keywords : Autonomous Driving System, CNN, Traffic Sign Classification, ResNet50 Architecture.