ABSTRACT

Machine Learning in Automotive:

Application of Convolutional Neural Network on Indonesian Traffic Sign Recognition

Automotive manufacturing companies have been able to integrate computer vision systems into cars as advancements in the technical capabilities of modern mobile processors. These systems play a key role in implementing a crucial step toward autonomous driving and considerably enhancing safety. Traffic Sign Recognition (TSR) is a task to tackle among other computer vision-based jobs, where it requires expensive hardware computational performance and inability of some systems to categorize traffic signs from various countries. Therefore, this research focuses on Indonesian traffic signs as part of the effort to point out the opportunities of application of machine learning in the Indonesian automotive sector. This research aims to increase the application of deep learning for better driving experience for manufacturers to process the data and use machine learning and overall leads to economic growth of the nation. The model employed in this research uses a classification algorithm using Convolutional Neural Network and implemented using TensorFlow framework. The entire process for Traffic Sign Detection and Traffic Sign Recognition is carried out using Google Colab. The prediction results in a high accuracy and is able to predict real-life pictures. Managerial recommendations are given afterwards using literature review and analysis that focuses on three aspects: business, technical and social and environmental issues.

KEYWORDS: *artificial intelligence, machine learning, deep learning, artificial neural network, convolutional neural network, traffic sign detection, traffic sign recognition, intelligent transportation system*