Mobile machine vision for railway surveillance system using deep learning algorithm

ABSTRACT

Trains have been a popular transportation in our daily life. However, there is no proper surveillance system for obstacle detection at the railway, leading to the happen of unwanted accidents. In order to overcome this issue, machine vision embedded with deep learning algorithm can be implemented. Obstacle detection can be achieved through vision-based object detection, where the object classification model computes the images similarity to its respective classes, classifying its potential as an obstacle. In this paper, object detection model is developed and implemented with deep learning algorithm. Object classification model is produced through the model training with Deep Neural Networks (DNN). The detection model used in this paper is Single-Shot multibox Detection (SSD) MobileNet detection model. This model can be implemented with Raspberry Pi to simulate the object detection algorithm virtually. During simulation, the object recognition algorithm is able to detect and classify various objects into its respective classes. By applying past research approaches, the developed object detection model is able to analyze image as well as real-time video feed to identify multiple objects. Any object that has been detected at the Region of Interest (ROI) can be characterized as an obstacle.