

ABSTRACT

Train transportation is one of the public transportation used by the people of Indonesia. Based on data obtained from 2015 to.d. In 2020 there were 130 accidents that occurred, with details of the most accidents being caused by railway infrastructure including railroads. In general, the routine inspection of the railroads themselves is still carried out manually, which is inefficient, low in precision, and low in subjective evaluation. Then a solution is needed to detect defects on the surface of the railroad with the help of computer vision, so that results are obtained that are more efficient, precise, and have a subjective evaluation in railroad maintenance.

In this final project research a system will be designed that will detect defects on the surface of railroad tracks using the YOLOv7 model, with the dataset obtained from previous research, namely the Rail Surface Defect Detection (RSDD) dataset. In the previous study, the dataset used the Convolution Neural Network (CNN) method. The results of this study obtained the highest mean average precision value of 81.19% for type 1 dataset with OC-IAN and 91.76% for type 2 dataset with OC-TD. In this study, the YOLOv7 model used.

The defect detection system on the surface of the railroad designed in this study uses the YOLOv7 models with the highest performance results with a mAP value of 93.8% for the type 1 dataset with the YOLOv7-E6E model and a mAP value of 94.9% for type 2 with the YOLOv7-E6E model. This condition is obtained when the system resize input size is 640, the batch size value is 8, the learning rate value is 0.001. The increase in the mAP value occurs because the input is given flip, rotate, copy, and scale augmentations which allow the model to study more varied data.

Keywords: *Railroad, Computer vision, YOLOv7*