ABSTRACT

Inspection of defects in a product is needed to improve the product that has been made. One of the defects inspections that exist in an industry is the inspection of defects on the steel surface. A system is needed to detect and inspect defects on the steel surface automatically and optimally. This final project aims to inspect the defects on the steel surface.

In this final project, a system will be designed to inspect steel surface defects using the You Only Look Once version 4 (YOLOv4) method. The workings of this system are firstly the image will be entered into the system, then pre-processing is carried out to equalize the size and specifications of the image. Then the inspection process is carried out using the system that has been designed. In the end, the system will output the results of inspection and detection of defects on the steel surface.

This final project uses 1800 grayscale images which are divided into 6 types of defects, each of which has 300 images in it. 300 images are divided into 70% images for training data, 20% images for data validation, and 10% images for test data. The performance parameters analyzed are precision, recall, and mean average precision. From the results of the research that has been done, the best configuration is obtained using a learning rate of 0.0025, momentum of 0.9, and subdivision of 32. The precision value is 0.79, recall is 0.62, and the mean average precision is 76.11%.

Keyword : YOLOv4, Inspection of defects, pre-processing