ABSTRACT

Scattered garbage has become a problem that is difficult to eliminate. There are still many people who are lazy to throw garbage in its place. Trash such as keresek bags, cans, plastic bottles, and styrofoam are waste that is often disposed of carelessly by the community without regard to the impact that will occur in the surrounding environment. There are still many people who throw garbage into the river which can lead to natural disasters if people do not realize this. This research aims to make it easier for environmental cleaners to clean up garbage that is still carelessly thrown away by the community.

Waste that is often discarded by the community is usually in the form of plastic bags, plastic bottles, cans, and Styrofoam, one way to simplify the selection of waste is to make waste detection using the YOLOv5 (You Only Look Once Version 5) algorithm. YOLO (You Only Look Once) is one of the deep learning models that can detect objects according to the dataset that has been entered and learned by YOLO. By using YOLO, we can detect garbage according to the type of garbage that is often disposed of by the community in the river using CCTV cameras that monitor the area around the river.

The dataset used to train the YOLO algorithm is a dataset created by ourselves which has 2004 datasets consisting of 4 classes according to the dominant garbage objects that appear in the Cikapundung River. From the total dataset created, the dataset is divided into 3 partitions, including 1749 Training Data, 159 Validation Data, and 96 Testing Data. With a value of mAP (Mean Average Precision) = 76.4%, Precision = 92.3%, and Recall = 71.1%. By looking at the matrix, the detection has a fairly good accuracy to detect garbage in the Cikapundung River. We use YOLOv5 as the best model that can be adjusted to the specifications of the device we use. Implementation and testing of this project successfully detects garbage that can help cleaners in the Cikapundung River to monitor the garbage contained in the Cikapundung River.

Keywords: YOLO, CCTV, River, Garbage.