



PROJECT REPORT

**THE USE OF DATA BALANCING USING STANDARD
DEVIATION AS THE HYPERPARAMETER TUNING FOR
INDONESIA HIGHWAY VEHICLE GROUP DETECTION
FOR YOLOV5, YOLOV7, AND YOLOV8**

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ABSTRACT

*This research was conducted based on the discovery of 3 other research that compared the YOLO version, after reviewing an oddity was found because there was an older version of YOLO that had better detection accuracy results than the newer YOLO. This is not in accordance with the statement from other research that stated that the latest version of YOLO is an improvement from the previous version. So this research was conducted to compare the three versions of YOLO according to the 3 other research, namely a comparison will be made between YOLOv5, YOLOv7 and YOLOv8. In addition, an experiment also be done using hyperparameter tuning, namely data balancing based on the standard deviation value that determines the the lower limit and upper limit that used to create variaty number of image used as the train data which are useful for conducting experiments so that the comparison of the accuracy from three YOLO versions can be analyzed depth. The data balancing process produces 3 types of train data. From each of the three types of train data that have been formed, the detection process is done on the three versions of YOLO that is used in this research. After the experiment was conducted, it is found that the three versions of YOLO that used the "Std*1" type of train data that have the most number of image, had higher accuracy, here is the detection results using the related train data types YOLOv5 (52.9%), YOLOv7 (62.2%), and YOLOv8 (66.2%).*

Keyword: YOLO, object_detection, standard_deviation, data_balancing, hyperparameter_tuning