# ABSTRACT

Roads are an important infrastructure for community activities. Therefore, it ensures that regular road maintenance is necessary for the safety of road users. In carrying out road maintenance, it is necessary to collect data on road damage to make decisions regarding road repair efforts. Data collection on road damage using manual methods has the disadvantages of being unsafe, low efficiency and high costs. Therefore, an effective and efficient method is needed to identify road damage. Rapid advances in technology make the process of identifying road damage faster with remote sensing principles using deep learning technology. This research was conducted with the aim of building a road damage detection model using the YOLOv9 (You Only Look Once) algorithm and measuring the performance of the resulting model. The types of road damage identified are holes (potholes), longitudinal cracks (longitudinal cracks), lateral cracks (transverse cracks), and crocodile cracks (crocodile skin cracks). The dataset used is public data which contains a dataset of road condition images. The training data process is carried out using previously drilled weights to obtain a new weight that is capable of detecting road damage. The best model is selected based on the largest mean average precision (mAP) value in the data validation process. The best model is then tested using test data. The results of testing the YOLOv9 model produced a precision value of 76.2%, recall of 49.2%, and mean average precision (mAP) of 62.8%.

**Keywords** : Damaged Roads, YOLO, Deep Learning, Object Detection