Asphalt Pavement Pothole Detection using Deep learning method based on YOLO Neural Network

There are three different architecture configurations in this article Yolo: YOLOv3, YOLOv3 tiny, and YOLOv3 SPP. In this paper, the pothole detection method was used on these three architectures. Firstly, research the data on, secondly, annotate and label the data, and build a model using Yolo V3 architecture. Finally, with the modeling phase's output on weight, the detection and area measurement with testing data was done. The modeling process was done with 10,000 iterations. The lost data of YOLOv3 tiny was higher than YOLOv3 and YOLOv3 SPP, but the lost data of YOLOv3 and YOLOv3 SPP was quite the same. By using spatial pyramid pooling in Yolo V3 architecture, the mean average precision(mAP) increased by 5.5%, which provided Yolo V3 SPP the best mAP in this experiment.

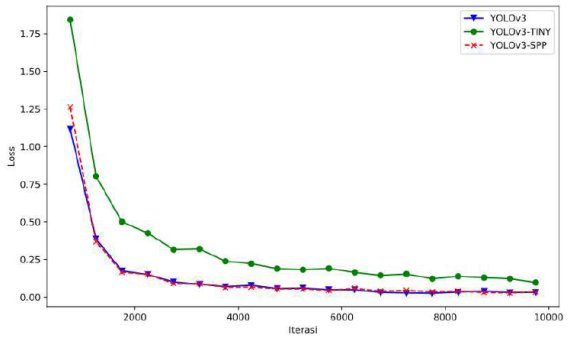

Figure 1. Loss of Yolo v3, Yolo v3 Tiny and Yolo v3 SPP in the modeling

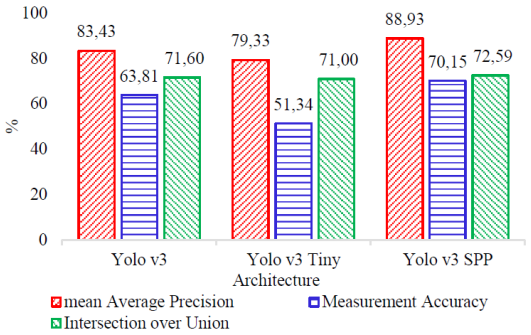

Figure 2. Mean Average Precision, Area Measurement Accuracy, and Intersection over Union

In this article, the central concept was to detect potholes with different types of YOLOv3 architecture. As always, YOLOv3 gives a satisfactory result only with the potholes in the images where other types of damages exist. Here this article is different from what the proposed method is. The proposed method is to find different types of damages, not only with the potholes.

Reference:

[1] Ukhwah, E. N., Yuniarno, E. M., & Suprapto, Y. K. (2019, August). Asphalt Pavement Pothole Detection using Deep learning method based on YOLO Neural Network. In 2019 International Seminar on Intelligent Technology and Its Applications (ISITIA) (pp. 35-40). IEEE.