A DEEP LEARNING APPROACH FOR STREET POTHOLE DETECTION

In this paper, for street pothole detection the authors proposed a method based on deep learning. There are four models that were trained and checked with a pre-trained dataset like YOLO V3, SSD, HOG, SVM, and Faster R-CNN. The appropriate data was collected and then transformed the labelled image file to train for using by the models as an input. Images were trained and labelled by creating a rectangular bounding box around the item on all of the training photos using the LabelMe tool. Hyperparameters were calibrated, and the size estimation of potholes was considered for more precise detection outcomes.

Size	YOLO V3	SSD	HOG	Faster R-CNN
200 Images	53%	47%	24%	72%
650 Images	67%	59%	25%	71%
850 Images	65%	55%	27%	67%
1000 Images	69%	59%	-	69%
1100 Images	73%	-	-	60%
1500 Images	82%	80%	-	74%

Figure 1. Comparison of accuracy of different models

There was a significant decrease in localization errors. The paper presented that YOLO V3 architecture has more speed than other models. Nevertheless, there were some errors in the detection of small objects. This work needs more improvement for the aimed project.

REFERENCES

[1] Ping, Ping & Yang, Xiaohui & Gao, Jerry. (2020). A Deep Learning Approach for Street Pothole Detection. 10.1109/BigDataService49289.2020.00039.