

## A DEEP LEARNING APPROACH FOR ROAD DAMAGE DETECTION FROM SMARTPHONE IMAGES

This paper describes the road damage detection and classification challenge's solution, IEEE Big Data Cup Challenge 2018. They used an object detection algorithm to train and detect damaged roads on different road damage types defined by Japan Road Association. The evaluation was done on various trained models and achieved an F1 score up to 0.62.

YOLO v3 with darknet43 backbone was used here as the object detection algorithm. The authors classified the road damages into eight types, generalized mainly into two categories: the first category is crack, and the second one is corruption. Python Augmentor was used to create synthesized images to solve the problem of class imbalance.

The dataset contained 7231 training images and 1813 testing images. All of the training images were annotated with one or more ground truth boxes corresponding to the eight types of road damages.



Figure 1. A Deep Learning Approach for Road Damage Detection and Classification

Although YOLO is fast, it uses bounding box annotation, which doesn't detect the exact shape or detail information of the damaged regions. Also, the imbalance of different classes is a major problem here.

## REFERENCES

- [1] A. Alfarrarjeh, D. Trivedi, S. H. Kim and C. Shahabi, "A Deep Learning Approach for Road Damage Detection from Smartphone Images," 2018 IEEE International Conference on Big Data (Big Data), Seattle, WA, USA, 2018, pp. 5201-5204, doi: 10.1109/BigData.2018.8621899.