ROAD DAMAGE DETECTION USING RETINANET

In this paper, the authors trained and tested different deep learning models to find efficient models with high accuracy. They used faster one stage detectors, classification, and bounding-box regression rather than traditional slower two-stage detectors like R-CNN and Fast R-CNN. Among those one-stage models, they found that RetinaNet can detect road damages faster with higher accuracy.

Initially, they tested the Single Shot MultiBox Detector (SSD) backbone with DenseNet, ResNet, and VGG network. Then, they used RetinaNet. They trained and tested RetinaNet with various backbone neural networks such as VGG, ResNet, InceptionResNetV2, and DenseNet. They used a dataset containing 9,053 damage images and 15,435 damage bounding boxes, where the size of the images was 600x600 pixels.
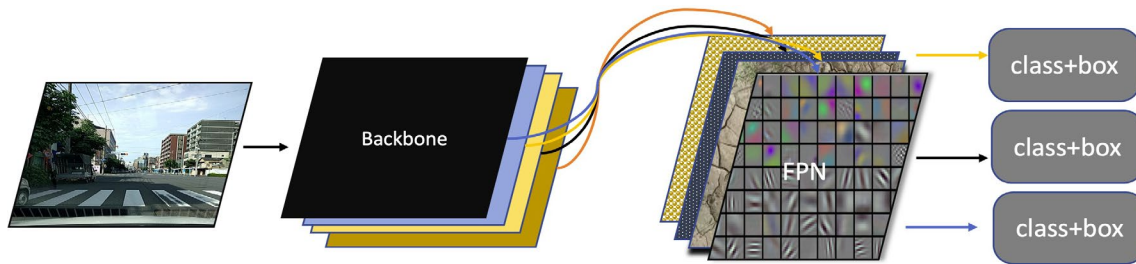

Figure 1. RetinaNet

SSD based models cannot achieve high accuracy because of imbalance class in the data samples. So, the authors trained and compared RetinaNet models with various backbones, including ResNet, VGG, DenseNet, and InceptionResNetV2, where DenseNet does not perform well. The authors concluded that their proposed RetinaNet based approach is efficient in detecting different types of road damage with high accuracy.

REFERENCES

[1] L. Ale, N. Zhang and L. Li, "Road Damage Detection Using RetinaNet," 2018 IEEE International Conference on Big Data (Big Data), Seattle, WA, USA, 2018, pp. 5197-5200, doi: 10.1109/BigData.2018.8622025.