Detection and Classification of Road Damage Using R-CNN and Faster R-CNN: A Deep Learning Approach

As monitoring manually in cities is time-consuming and lots of labor work, this paper proposed a model using R CNN and faster R-CNN to identify the road damage. In this model, 1100 images are resized and leveled with potholes, crack, etc. ran through R-CNN and Faster R-CNN for training. Here R-CNN built a massive integrated RPN and faster R-CNN with mutual convolutional feature levels or feature maps. ReLU activation function is implied between the convolutional and pooling layers. Adam Optimizer was used to minimize the loss. In this paper, Faster R-CNN worked better than R-CNN with an accuracy of 98.02% and validation accuracy of 99.80%, where R-CNN got the accuracy and validation accuracy of 71.44% and 76.01%.
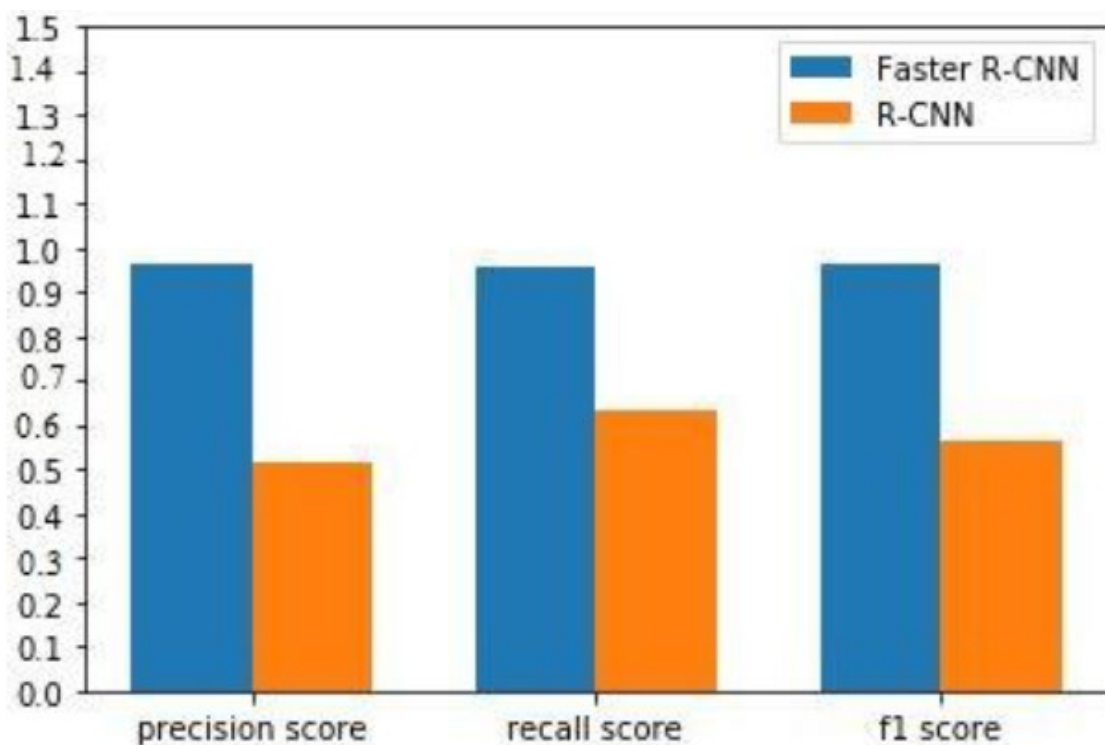

Figure 1. Evaluation Metrics

- In the neural network, Adam optimizer is an adaptive learning rate optimization only to serve this network specifically.

In our proposed method, the use of mask R-CNN that extents faster R-CNN for pixel-level segmentation. It is quite obvious that mask R-CNN is the better version of Faster R-CNN and it also serves the purpose of proposed method by doing instance segmentation.

Reference:

[1] Arman, M. S., Hasan, M. M., Sadia, F., Shakir, A. K., Sarker, K., & Himu, F. A. (2020, February). Detection and Classification of Road Damage Using R-CNN and Faster R-CNN: A Deep Learning Approach. In International Conference on Cyber Security and Computer Science (pp. 730-741). Springer, Cham.