Automatic Crack Detection using Mask R-CNN

This paper presented that R-CNN masks can identify cracks on concrete surfaces and get correlating masks to help isolate other properties useful for analysis. The paper's author developed a ground-truth mask database on images from a regular crack dataset for train Mask R-CNN for crack detection.

Several literature methods, such as detection of saliency, texture analysis, transforming wavelets, minimum direction tracking, and machine learning. This paper adapted Mask R-CNN to simplify crack detection on concrete surfaces to the current state-of-the-art detection model.

The model was developed using a dataset that uses an image base from a recent image sample to train and evaluate data sets of crack-related artificial-intelligence detection algorithms. Multi-class analysis for other components and defects of infrastructure will minimize defects and provide efficient inspection means of civil structures. The datasets' results are exact and about an accuracy value of 93.94% and a recall of 77.5%.

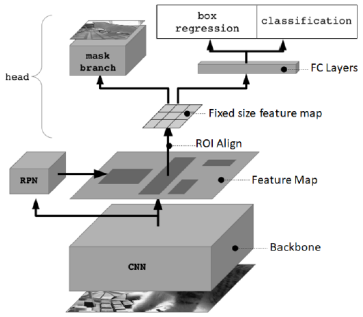

Figure 1. Mask R-CNN pipeline diagram

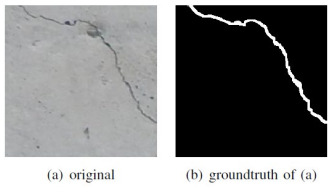

Figure 2. Sample images from the annotated crack dataset

This is only for crack detection in many things like whether it has been cracked or not, but the proposed method is to find different road damage types. So, things needed to change in order to do so.

References:

[1] L. Attard, C. J. Debono, G. Valentino, M. Di Castro, A. Masi and L. Scibile, "Automatic Crack Detection using Mask R-CNN," 2019 11th International Symposium on Image and Signal Processing and Analysis (ISPA), Dubrovnik, Croatia, 2019, pp. 152-157, doi: 10.1109/ISPA.2019.8868619.