

## ROAD CRACK DETECTION USING DEEP CONVOLUTIONAL NEURAL NETWORK AND ADAPTIVE THRESHOLDING

The work in this paper was done by using CNN to Adapt thresholding to detect the road crack. The work was proceeded in two steps: image classification and the other is image segmentation. Here, CNN is being used mainly for the image classification part as it works as a feature extractor and determines the crack's existence. One term is added: ReLU, representing a rectified linear unit, which is the most popular activation function for deep neural networks.

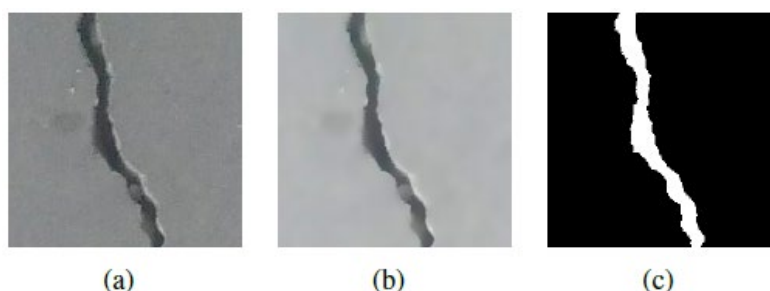


Figure 1. Bilateral filtering and image segmentation; (a) original positive image; (b) filtered positive image; (c) segmentation result

An adapting thresholding approach was used for the segmentation process. In the segmentation part, before approaching the adapting thresholding, a bilateral filter was used to smooth the input images. Here the primary technique of this work is adapting thresholding for segmentation. This thresholding method hypothesizes that the filtered image comprises two parts: foreground (cracks) and background (road surface). To find the best threshold  $\delta$ , they formulated the thresholding problem as 2D. This 2D histogram thresholding formula can segment the crack images.

Here, this paper's method 2D histogram thresholding can only segment the crack-based areas, but our proposed model can detect the damaged road and segment its damaged part. For the paper's model, things need to be changed in the 2D histogram part because it only segments the crack areas.

## REFERENCES

- [1] Fan, R., Bocus, M. J., Zhu, Y., Jiao, J., Wang, L., Ma, F., ... & Liu, M. (2019, June). Road crack detection using deep convolutional neural network and adaptive thresholding. In 2019 IEEE Intelligent Vehicles Symposium (IV) (pp. 474-479). IEEE.