

## **In-situ application of deep learning-based crack detection technique to real bridges**

\*Soojin Cho<sup>1)</sup>, Byunghyun Kim<sup>1,2)</sup>, and Geonsoon Kim<sup>3)</sup>

<sup>1), 2)</sup> *Department of Civil Engineering, University of Seoul, Seoul 02504, Korea*

<sup>3)</sup> *Industrial Technology Research Center, University of Seoul, Seoul 02504, Korea*

<sup>1)</sup> [soojin@uos.ac.kr](mailto:soojin@uos.ac.kr)

### **ABSTRACT**

A deep learning-based automated crack detection technique, which is actively studied lately in the construction and inspection field, has been applied to two real bridges. The deep learning model is trained based on damaged and corrupted images taken from the Internet and real structures, and automatically identifies the features of damages against objects that exhibit color and contrast features similar to those of damages. The trained deep running model can only detect damage from the exterior appearance images. The deep learning model used in this study is a mask R-CNN model pre-trained with 200,000 COCO dataset. Transfer learning is performed using training data collected from Internet and the other bridges. Cracks of the bridges are detected using the trained model, and the results are analyzed in depth.

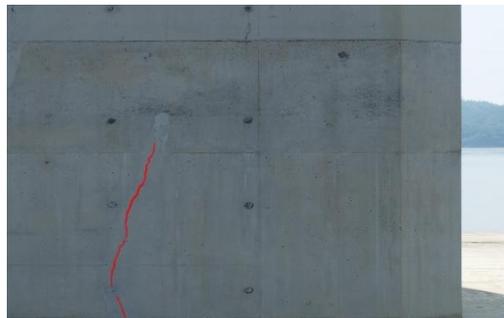


Fig. 1 Example of detected crack on a bridge pier

### **REFERENCES**

Kim, B. and Cho, S. (2019), "Image-based Concrete Crack Assessment using Mask and Region-based Convolutional Neural Network", *Struct. Control Hlth.*, Accepted.

---

<sup>1)</sup> Assistant Professor

<sup>2)</sup> Doctoral Student

<sup>3)</sup> Researcher