## TRACK: INFORMATION TECHNOLOGY Presentation: Image based retrieval

R.S. ADHIKARI, O. MOSELHI, A. BAGCHI. Image based retrieval of concrete crack properties. Gerontechnology 2012;11(2):315; doi:10.4017/gt.2012.11.02.458.00 Purpose This paper presents a new method to retrieve concrete crack properties based on image processing techniques. **Method** Detection and quantification of cracks in concrete bridges pose various challenges. Cracks have fewer pixels compared to their background. For effective visualization, the objects need to be captured from near field. But it is not always possible to capture the complete cracked surface in a single frame while taking the image from near field. Hence image stitching is required before pre-processing of images for further analysis. Usually retrieved images have low contrast due to environmental and equipment limitations which add another difficulty in image visualization. State-of-the-art image pre-processing as suggested in the literature may not be suitable for images captured in different environmental conditions. This paper discusses various techniques for image enhancement using point processing, histogram equalization and mask processing. Furthermore, a binary image is required to obtain a skeleton of an object. However, the pre-processing techniques cause discontinuity in crack alignment. Morphological techniques (e.g. dilation) are used in this work through successive iteration to ensure connectivity. Then the object skeleton which is unaffected by expanded boundaries is obtained by using skeleton algorithm to retrieve concrete crack properties such as length, bounding rectangle, and major and minor principal axes lengths. **Results & Discussion** The preliminary results obtained using this methodology as shown in Figure 1 is capable of retrieving length, orientation and bounding box of the identified cracks. This method is aimed at assisting in obtaining automated prediction of condition state (CS) rating of cracks in bridges. It can be also used as a tool for post-earthquake damage evaluation purposes.

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Figure 1. The proposed methodology