

Abstract: Detection of Cracks on Concrete Surface Using Fuzzy Technique and Brightness

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Abstract

In the maintenance of concrete buildings, cost and safety factors are largely dependent on the accurate detection of cracks on a concrete surface. In most cases, that process is done by time consuming and inefficient manual inspection. Thus there is a growing need to apply computerized techniques such as image processing with non-subjective measurement. However, images of concrete surface cracks could be damaged due to the influence of the light or environmental reasons during image acquisition. Moreover, it is quite difficult to detect cracks from images across uneven concrete surfaces or noisy images with decent accuracy using existing crack detection methods. Thus we propose a new crack detection method applying fuzzy techniques to the RGB components of the concrete image to detect candidate cracks that permeate across concrete areas. The cracks are then further examined to remove minute noise from detected candidate cracks by using the density and brightness to exclude false positives. Our experiment using real world concrete surface images demonstrates that the proposed method is more accurate and more effective than existing methods for such delicate cases.