Intelligent Segmentation Method for Real-Time Defect Inspection System

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Abstract

To extract desired flaws from various types of images, the integration of different segmentation methods is required. In this study, we present an intelligent method for automatic selection of a proper image segmentation method upon detecting a particular flaw type. The new method is capable of choosing the most suitable method from four segmentation methods currently available. The automatic selection procedures start from the pre-segmentation of an image to be examined. Then, the predetermined features are extracted from the original, foreground, and background images. After that, a suitable segmentation method will be selected using a classifier based on six features. Finally, the image is re-segmented by the selected segmentation method to discover flaws. The proposed method has been tested using 1676 defective images. The results show a significant reduction in misclassification rate from about 44% to 13.96%.