

Image Tampering Detection by Blocking Periodicity Analysis in JPEG Compressed Images

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ABSTRACT:

Rapid progress in image processing technologies keeps bringing new issues and challenges in image authentication. Although many digital watermarking methods have been studied for image authentication, these methods unfortunately cannot provide as a general solution in the absence of a popularly adopted watermarking technique. Without using watermarks, many passive or non-intrusive methods have been proposed recently for digital image tampering detection. Since JPEG image format has been a popularly used image compression standard, tampering detection in JPEG images now plays an important role. The artifacts introduced by lossy JPEG compression can be seen as an inherent signature for compressed images. In this talk, I will present our proposed method for analyzing the blocking periodicity by, 1) developing a linearly dependency model of pixel differences, 2) constructing a probability map of each pixel's belonging to this model, and 3) finally extracting a peak window from the Fourier spectrum of the probability map. We will show that, for single and double compressed images, the peaks' energy distribution behave very differently. We exploit this property and derive statistic features from peak windows to classify whether an image has been tampered by cropping and recompression. Experimental results will also be given to demonstrate the validity of the proposed method.