

Title: Source Identification Using Color Interpolation

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Abstract

While digital imaging devices, such as digital cameras and scanners, bring unquestionable convenience of image acquisition, powerful image processing software also provides means for editing images so as to serve good and malicious purposes. The tasks of digital forensics can be divided into different categories, such as source classification, device identification, Integrity verification, etc. In this work, we concentrate on the color interpolation of the digital camera, for device identification and integrity verification. Device identification is “biometrics of camera” at discriminating the source of photos. Integrity verification, known as forgery detection, helps to verify the authenticity of images. It is mostly based on detecting local inconsistencies in the image.

Color interpolation matrix is a very important “fingerprint” of the digital camera. Most digital cameras only capture one of the three components of RGB on each pixel. For every pixel, the missing two RGB components are interpolated from its neighbors by the color interpolation matrix. Different cameras normally use different color interpolation matrices, thus we can estimate the color interpolation matrix to identify the source of the digital image, by comparing the estimated color interpolation matrix to the sample matrices of the cameras. To detect the forged image, we can estimate the color interpolation matrix of the suspicious area can compare it with the interpolation matrix from the certainty area. In our work, we estimate the color interpolation matrix by solving a group of linear interpolation equations.