A New Zernike Moments Based Technique for Camera Identification and Forgery Detection

OMAR ELFAROUK MAMDOUH IBRAHIM FOUAD FAHMY

Abstract

In multimedia forensics, it is important to identify those images that were captured by a specific camera from a given set of N data images as well as detecting the tampered region in these images if forged. This paper presents a new technique based on Zernike moments feature extraction for blindly classifying correlated PRNU images as well as locating the tampered regions in image under investigation. The proposed clustering algorithm is based on estimating the Zernike moments and applying a hierarchical clustering for classification. The forgery detection algorithm is based on picking up the peak Euclidean distance between the Zernike moments vector of blocks of the scaled-down forged image and its corresponding ones in the capturing camera PRNU. As Zernike moments are scale and rotational invariant, its feature when computed using scaled-down PRNU images lead to considerable computation time saving. Simulation examples are given to verify the effectiveness of the proposed techniques when compared to other state-of-the-art techniques even in case of very weakly correlated PRNU.

Signal Image and Video Processing SIVP 2016, November