A Survey of Deep Learning-Based Source Image Forensics

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As deep learning methods are heavily dependent on training data, it is difficult to declare a winner when comparing methods that have been evaluated on different datasets

# Scholarcy Highlights

* With the development of modern techniques, digital imaging has become an important component in our daily life
* The results reported in their paper show that the performance of this method is better than the conventional methods, like Geo [77], SPAM [44], and Mfra [78], which indicate the effectiveness of convolutional neural networks (CNN)-based method on computer graphics (CG) image forensic
* In this paper we presented a comprehensive survey of deep learning-based source image forensics, anti-forensics, and counter anti-forensics
* Those architectures have proven to be effective when dealing with source image forensics tasks, even though they were originally developed for different scenarios
* As deep learning methods are data-driven, many contributions are focused on data enhancement techniques to improve the signal-to-noise ratio of data provided to CNNs
* Team GPU\_muscle [30,32] collected more than 500 GiB of photos from various resources (Flickr, Yandex.Fotki, Wikipedia Commons, mobile reviews, and others) and obtained an accuracy of more than 98% by training traditional
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# Scholarcy Summary

## Introduction

With the development of modern techniques, digital imaging has become an important component in our daily life.

It is easy for us to capture digital images with devices such as smartphones and digital reflex cameras, embellish them by using photo-editing software, and upload them to social network platforms to share the important moments of our life with our friends.

The ease with which we handle digital images, is a double-edged sword.

## Methods

DCGAN Discriminator CelebAHQ [93] LFW [94]

## Results

We will describe the evaluation protocol and the datasets used in the reviewed papers.

In order to fairly evaluate the performance for original and manipulated images in case of unbalanced datasets, a weighted accuracy is used in some papers: Accweighted = Accunaltered + Accaltered (4).

Where Accunaltered , Accaltered denote the accuracies in the case of unaltered images dataset and altered images dataset, respectively.

In Proceedings of the 2019 IEEE Winter Applications of Computer Vision Workshops (WACVW), Waikoloa Village, HI, USA, 7–11 January 2019; pp. 63–72.

Signal Processing Society - Camera Model Identification; IEEE: Piscataway, NJ, USA, 2018.

## Discussion

Discussion and ConclusionsIn this paper we presented a comprehensive survey of deep learning-based source image forensics, anti-forensics, and counter anti-forensics.

Most researchers based their methods on popular CNNs for computer vision, such as ResNet, XceptionNet, and DenseNet. Most researchers based their methods on popular CNNs for computer vision, such as ResNet, XceptionNet, and DenseNet

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## Conclusion

The most significant network parameters and the experimental settings of the reviewed works are summarized, where we have identified twelve main architectures.

Yang et al [50] presented an effective and practical deep learning-based method to address this problem: Laplacian Convolutional Neural Networks (L-CNN).

In this technique the Laplacian filter is embedded into the first layer of a CNN to improve the noise signal ratio introduced by recapture operations.

In that paper five different kinds of high-pass filters have been evaluated