Since the forensic examiner will search for each of these, significant interest has emerged in the development of universal forensic algorithms capable of detecting many of the latest image editing operations and manipulations.

Specifically, they proposed a new convolutional network architecture capable of automatically learning how to detect manipulation straight from training data. Throughout their current form, convolutional neural networks can learn features that capture the meaning of the object as opposed to the manipulation of the detection features.

Through a series of experiments, they showed that their proposed method could automatically learn how to detect multiple image manipulations without relying on pre-selected features or pre-processing.

The results of these experiments show that their proposed approach can automatically detect several different manipulations with an average accuracy of 99:10 percent.

While the design of targeted editing detectors has led to many significant advances in data forensics, this approach to image authentication has a considerable loss. A forensic investigator will conduct a large number of forensic tests to determine if and how the image has been edited.

When multiple forensic tests were performed on an object, the investigator may tackle several new problems, such as monitoring the overall false alarm rate between various tests and dealing with con-icing outcomes.

These features are extracted from the image by a set of convolutional filters, the coefficients of which are learned using a technique known as back-5 propagation, then aggregated using a pooling function.

Although CNNs are able to learn useful features for object recognition adaptively, they are not well suited to detect image manipulation in their current form.

Instead of learning how to identify the traces left by editing and manipulating, the convolutional layers will extract features that capture the content of the image.

Through a series of experiments, they tested the capacity of CNN to serve as a universal image manipulation detector.

Most forensic and steganalysis algorithms can be viewed as specific variants of the following detection approach: predict that pixel value based on its neighbors according to the fixed law, measure a prediction error, construct a lower-dimensional feature vector or test statistic from these prediction errors, and then make a decision based on this vector feature or test statistic. This approach has also recently been extended to camera design identification.

To evaluate the performance of their proposed CNN model for image editing detection, they first built a database of unmodified and edited images. Their experimental image datasets were collected from 12 different camera models and devices with no prior tampering pre-processing.

They created a set of grayscale images by keeping only the green color layer of each image. They cut each original image in the middle, then subdivided it into 256\*256 blocks.

In this paper, they proposed a novel CNN-based universal forgery detection technique that can automatically learn how to detect various image manipulations. To prevent CNN from learning features that represent the content of the image, they proposed a new type of convolutional specifically designed to suppress the content of the image and learn how to detect manipulation. They accomplished this by constraining this new convolutional layer to learn prediction error filters.