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Forgery Detection Technique Based on Illumination Inconsistency for Given Image: A Review

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Abstract*— Photographs are used to represent real-world events. It propose technique analyze one of the most common forms of photographic manipulation, known as image composition or splicing. The proposed a method of forgery detection exploits inconsistencies in the color of the illumination of images. This is machine-learning based approach and requires minimal user interaction. The technique is applicable to images having two or more people and requires minimal expert interaction for the tampering decision. From these illuminant estimates, extract region based features which are then provided to a machine-learning approach for automatic decision-making. The classification will be done using an SVM meta-fusion classifier is promising. Illumination inconsistency detection of image it is difficult to achieve proper illuminant condition for the entire image.

Keywords*—Image collection ,original image ,forged image,dataset creation, feature extraction ,classification using SVM classifier

I. INTRODUCTION

Photograph represents real-world events. Today many powerful image editing software's like Gimp, Photoshop etc. are available. Any image can be manipulated by using these software. Although photographers are able to create different composites of analog pictures, this process requires long time and requires expert knowledge. Image composition or splicing is one of the important technique of image manipulation. Sometimes these manipulated images are provided as evidences in court and this may produce serious problems. So it is important to check whether the images available are forged or not[3]. This analyze one of the most common forms of photographic manipulation ,known as image composition or splicing. This forgery detection method that exploits certain inconsistencies in the color of the illumination of images. This is machine-learning based approach and requires minimal user interaction[6].

The classification performance with using an SVM meta-fusion classifier is promising. Illumination inconsistency is occurs because it is difficult to achieve proper illuminant condition while performing forgey in image for the entire image[6]. When forensic investigators assessing the authenticity of an image,use all available sources of tampering evidence. Illumination inconsistencies are effective potentially for detection of splicing in the image from the viewpoint of a manipulator, in proper way the adjustment of the illumination conditions is difficult to achieve when creating a composite image.

II. RELATED WORK

In the recently previous research they used the different algorithms to classify the images for forgery detection which, but it is still necessary to improve their performance in terms of accuracy rate because they got failed to provide good output.

Image composition or splicing is one of the common image manipulation operations. This technique involves a composite of the two or more images which are combined to create a composite forged image. The previous methods based on illumination inconsistencies concentrates on region based approach i.e. their method can be applied to image with faces only. Also they prefer to use a single algorithm for illuminant color estimation. So their accuracy is low. So in this work in order to improve the accuracy, illumination inconsistencies are combined to produce a new technique for image forgery detection.illumination inconsistencies are effective potentially for splicing detection from the viewpoint of a manipulator, adjustment in the proper manner of the illumination conditions is hard to achieve when creating a composite image In this work, system make an important step towards minimizing user interaction for an illuminant-based tampering decision-making.

III. PROPOSED RESEARCH

For detecting the forgery in the image first collect the set of images. Feature extraction of the images will be done by using proposed technique. Feature extraction includes the extraction of information on the distribution of edges. Then, from the extracted features create dataset and store those dataset in the machine database. Pass those dataset to SVM classifier, the classifier is trained in classifying the image in two classes from dataset by comparing the receiving dataset with dataset of the reference image that was stored previously. After comparing dataset, classifier classifies whether image is forged or not.

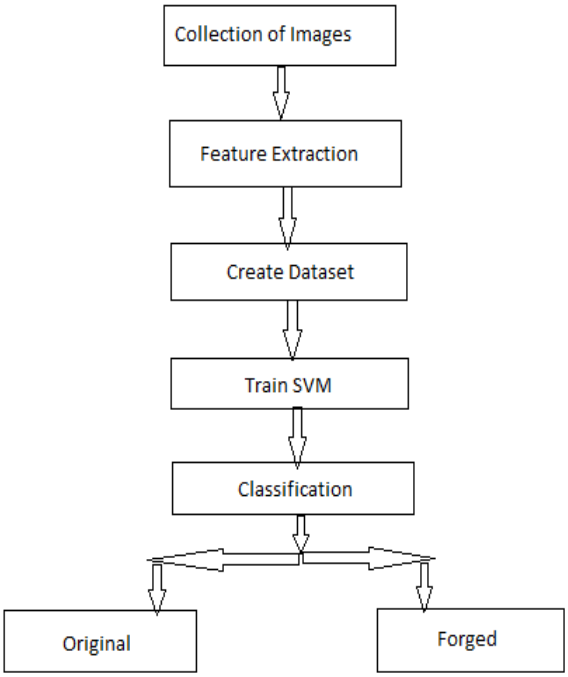

Fig. 1. Flow Chart of propose plan of work

IV. PROPOSED METHODS AND ALGORITHMS

The proposed image forgery detection method is based on illumination inconsistencies and resampling properties. This is based on the fact that the illuminant color of images taken under different lighting conditions will be different.

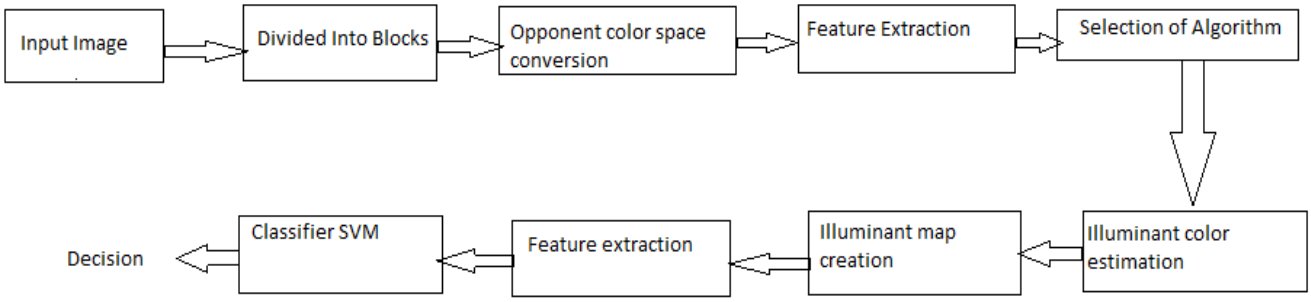

Fig 2. Block diagram of forgery detection technique based on illumination inconsistency

A. Collection of image and dividing it into blocks:

The color image is first divided into many non-overlapping subblocks. The block size is taken as 32 * 32.This is because when block size increases the location accuracy dicreases and when block size increases the angular error increases. Angular error is the error between true and estimated illuminant color.

B. Opponent color space conversion:

For a color image, the R, G, and B channels are highly correlated each block is transformed into an opponent color space called HSV color space before feature extraction.

C. Feature Extraction:

Then from the opponent color space block features are extracted. The extracted features include contrast and mean values. Contrast is the difference or variance in luminance or color that makes an object distinguishable. The contrast value for each block can be calculated by finding the standard deviation of pixel values of corresponding block. The mean value for each block can be calculated by finding the average grey level of pixel values of corresponding block.

D. Illuminant color Estimation:

Based on the values of extracted features, proper illuminant color estimation algorithm is selected for each block. The illuminant color estimation algorithms include grey world algorithm.

E. Classifier SVM:

The classifier has two stages a training stage and a testing stage. In the training stage, the classifier is trained for different types of real and forged images in the data base. In the testing stage the classifier select appropriate class for each test image based on the training data.

F. Applications

1) Technique can be used in the medical and forensic applications to check the genuinity of images.
2) The verification of originality of the images is required in variety of the applications such as military, media, scientific etc.

V. EXPECTED OUTCOME

The database is created and their manipulated images are used as query image when the query image is entered by the user, image is preprocessed and features are calculated. The classifier classifies it as genuine image or forged.

VI. CONCLUSION

This work present a new method for detecting forged images of people using the illuminant color. It Estimates the illuminant color by using a statistical gray edge method and a physics-based method. In order to describe the edge information, propose a new algorithm which is based on edge-points and the hog descriptor, called hogedge. The proposed method requires a minimum amount of human interaction and provides a statement on the authenticity of the image. Additionally, it is a significant in the exploitation of illuminant color as a forensic cue.

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