Review Paper-Detecting Copy Move Forgery in Digital Image using Sift

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Abstract—This paper describe the basic key-points, different feature about the image. Linkage and Clustering has been used to create this algorithm.
Keywords—SIFT, SURF ,Copy-Move, Linkage Clustering, 2D-DWT.

I. INTRODUCTION

The latest enhancement of Photoshop and updates in digital processing has made theses editing software so easy to handle that even the non-professionals can also easily edit the image as per their requirement [4].Modifications of these digital images can bring some pleasure to one's life and one can use or modify it as per his need or just to have fun without causing any harm to others. Therefore, it is essential to develop techniques to confirm the autherization, validity and uprightness of digital images and it the primary goal of image forensic. Image forensic is used for detecting the confirmation of forgeries, and its objective is to strengthen the validity of digital image. In comparison to the water marking based verification approach, forensic has been still progressing and number of algorithms for modifications are used.

However the idea behind tampering can be covert or hidden at times, which can spoil the reliability of image, its accuracy, and the safety in case of armed forces. When we match or use those images for some purpose, it results in huge losses.

The basic focus is on detecting Copy-Move image tampering technique in that one part of image is copy as well as pasted and the original image gets modified. Human eyes cannot detect the changes in the image. Changes are so refine. The process of making borders unclear is called blurring which modifies the region so that you cannot distinguish between original and pasted images. In contrast to the block-based methods, the image is not split into blocks so that the features are taken out from the complete image in the key-point image. SURF and SIFT are highly used in used in this approach. These methods are used to abstract unique features, key-point descriptors which present in that feature [8]. Feature like vector and descriptor are remains unaffected to variation, transformation and scaling and is partially affected to change in brightness and are robust in geometric alteration.

Features like Scale invariant features transform that are constant if we changes the brightness, alternation are applied by Huang et al. so that duplicated regions in the image is detected.[2]

II. LITERATURE REVIEWS

Bharat M. Prajapati, Nirav P. Desai[1] -Digital images have been widely used from last few years in various applications such as forensic evidences, medical, insurance and military etc. With easy availability of low-cost image modification and editing software such as Adobe Photoshop, GIMP (GNU Image Manipulation Program), paint etc. digital image content is not considered as safe. There are various types of image tempering techniques but Copy-move is the mostly used. In this technique, some part of image is copied then it is pasted on same Image, which changes the visual contents of image. A new methodology is used for the forensic analysis of Digital image tempering. In this technique, we propose detection method based on SIFT (Scale Invariant Features Transform). In this we use RANSAC (Random Sample Consensus) algorithm which accurately detect tempered location and regions. This method is robust and less time is required for detecting tempering in digital images than other methods.

Feng Liu,Hao Feng[8]- With the development of so many digital processing softwares, digital tampering is commonly done. Based on Discrete Wavelength Transformation and SVD, algorithm is planned for image forgery

detection by copy and move in this paper. In the experiment, Gaussian blurring was used to distort the image, even though this algorithm determined multiple copy-move forgery. It also traces the replicated regions, by JPEG compression and their diverse processes.

Rani Susan Oommen, Jayamohan M.,Sruthy S.[9]- Development of new image editing tools, modification of images has become a very easy task. In Copy-move forgery, image meaning has changed, where one area is copy and after that pasted to another area inside on the same image. The objective of copy-move forgery may be to add some features that are unwanted, or to delete some local features which are otherwise present according to our requirement. Techniques like dimensionality reduction, moments, texture analysis has been experimented. This paper presents a study of various image forgery techniques and a survey of various attempts in copy-move forgery detection. A comparative analysis of various techniques has also been done.

S. Fattah,M. Ullah,M. Ahmed,C.Shahnaz [6]- Based on a block matching algorithm, a forgery detection scheme using copy-move is established in this paper. 2D-DWT is used rather then most common spatial blocks. Co-efficient of DWT is utilized from forged image and then block domains are considered. In this we basically reduce the computational burden. Previously we used block matching in all the blocks but in this we have selected some unique candidate blocks. For non-overlapping blocks we use similar measure. For Next stage, candidate blocks will compare with overlapping blocks. Similarly method is used to finally detect the forged blocks. In the proposed algorithm it detects copy-move forgery by using extensive simulation.

K.Kiruthika,S.DeviMahalakshmi,K.Vijayalakshmi [5]- In this paper, multiple copies of the same area and different areas have been detected. In key point-based Method (mainly used in this paper),Speeded up Robust Features method is used for extracting the feature. The matched points can be identified by g2nn. Then the Agglomerative Hierarchical .False detection rate can be reduced by using clustering.

Hitesh Batra, Dr.Sanjay Badjate[1] -In this paper basically passive image has authentication identified and the various copy move Forgery detection techniques are analysis.

III GAPS IN STUDY

Feng Liu,Hao Feng-An efficient algorithm for image copy-move forgery detection based on DWT and SVD.Every comparison will include the measures precision that basically detects forgery.From the study of literature it is analysis that separate set of 100 grayscale images of sizes. This algorithm has DAR with values 0.09997 which is similar to another DAR 0.995.

Rani Susan Oommen, Jayamohan M.,Sruthy S.- From the study of literature it is analysis that various image forgery techniques and a survey of various attempts in copy-move forgery detection. A comparative analysis of major techniques is also not implemented.

Bharat M. Prajapati, Nirav P. Desai -Forensic analysis of digital image tampering From the study of literature it is analysis that,they propose detection method based on SIFT (Scale Invariant Features Transform).They use RANSAC (Random Sample Consensus) algorithm which accurately detect tempered Region and its location. This method is robust and less time required detecting tempering in digital images than other method.

S. A. Fattah,M. M. I. Ullah,M. Ahmed,I. Ahmmed and C. Shahnaz- From the study of literature it is analysis that the non-overlapping blocks based on a similarity measure. In the Next stage, all overlapping blocks are compared with the Candidate blocks which are quite similar to other technique. A similarity criterion is introduced to finally detect the forged blocks. Simulation is carried out on several forged images and it is found that proposed algorithm can efficiently detect copy-move forgery.

K.Kiruthika,S.Devi Mahalakshmi, K.Vijayalakshmi- From the study of literature it is analysis that Detecting Multiple Copies of Copy-Move Forgery Based on SURF that detect results in tampering of images. A major Problem that occurs in the real world is to determine whether an image is authentic or forged. In keypoint-based Method, SURF (Speeded up Robust Features) method is used for feature extraction.

Hitesh Batra, Dr.Sanjay Badjate- From the study of literature it is analysis that on Copy Move Forgery Techniques with the presence of image editing software and digital cameras, techniques for digital image tampering are becoming more and more sophisticated and widespread. Copy-move forgery is one of the widely used tampering techniques where one part of an image is copied to some other part of image in with a view to cover a potentially important feature.

IV METHODOLOGY/ PLANNING OF WORK

In copy-move forgery, there exists a strong correlation between the copied and pasted parts which can be used as evidence for detecting copy-move forgery. Given a tampered image of size M*N, the major steps involved in the detection is as follows:

A.   *Pre-processing*

The aim of pre-processing is the improvement of image data that suppresses unwanted distortions or enhances some image features important for further detection. The given image is converted into grey-scale (color conversion) when applicable (except for algorithms that require color channels). Other pre-processing techniques includes, dimension reduction, image resizing, low-pass filtering etc. In both block-based and key-point based methods necessary pre-processing can be applied.

B.   *Feature Extraction*

For block-based methods, feature vectors are extracted for each block. While for key-point based methods, feature vectors are computed only key-points in the image such as regions with entropy etc.

C.   *Matching*

After feature extraction, the potential copy-move pairs are identified by searching blocks with similar features. Highs milarity between feature descriptors can be interpreted as duplicated regions. In block-based method lexicon graphically sort similar features and Best-Bin-First search method to get approximate nearest neighbor in key-point based methods helps in the feature matching.

D.   *Filtering*

A single similarity criterion is not enough to claim the presence/absence of duplicated regions. Filtering schemes are thus used to reduce probability of false matches. Finally post-processing can be done to preserve matches that exhibit a common behavior.

Pre-processing

Feature Extraction
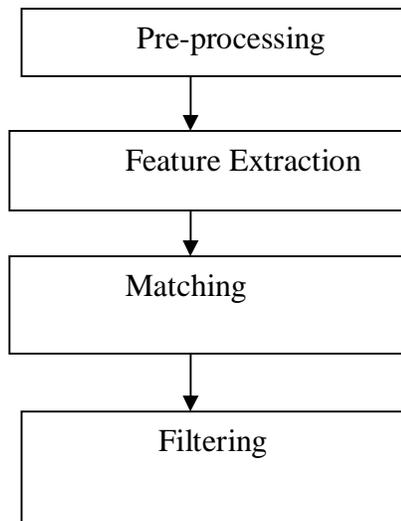
Matching

Filtering

Fig 3.Flow-chart for methodology/ planning of work

V RESULTS AND PERFORMANCE ANALYSIS

Collection of data has been used so that we can test the performance of algorithm. For the purpose of testing, some part is copy and paste on the same image and saved to the same image with JPEG format. We basically use inbuilt functions of MatLab - Linkage and Clustering for detecting the forgery part which show the number of match point and further number of transformations. SIFT features in a single image uses our multiple match strategy. In this algorithm, 2D-homogarphy is also used for attaching similar point together

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