SPLICING IMAGE FORGERY DETECTION USING TEXTURAL FEATURES

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Abstract

Digital image tampering becomes a common information falsification trend. Copy-move forgery is one of the tampering types that are used. To improve the detection rate with relatively low dimension feature vector, a novel passive splicing detection method using textural features based on the CRMS is proposed in this project. Image forgery is the science of detecting image tampering whether with a previous knowledge about the source image (active) or without (passive). In this paper, we propose a method which is efficient and fast for detecting Copy-Move regions even when the copied region has undergone rotation modification in spatial domain. The proposed method accelerates block matching strategy by parallel comparison between blocks. The feature vectors of each cluster blocks are lexicographically sorted by radix sort, and then a similarity measure is calculated between each nearby blocks. The experimental results show that the proposed method can detect the duplicated regions efficiently even when an image was modified by JPEG compression, rotation and smoothing conditions. The proposed system reduced processing time up to 75% of other previous works.

Keyword- Copy Move –Block matching

I. INTRODUCTION

The digital world nowadays contains a large amount of digital images used for effective communication process. It becomes very easy for professionals or non-professionals to edit any pre-existing photographs by using freely available image editing tools, such as Photoshop, thus modifying the content of the original image. So there arises a need to develop more reliable and efficient digital image forgery detection methods

II LITERATURE SURVEY

"Intelligent reversible watermarking and authentication: hiding depth map information for 3D cameras" by A.Khan, S. A.Malik, A.Ali, R.Chamlawi, M.Hussain M.T.Mahmood.

In this paper, an application for 3D cameras by reversibly hiding the depth map in the corresponding 2D images. The proposed technique is prospective in camera capable of capturing simultaneously the 2D image and resultant depth map of an object. 3D cameras equipped with self-embedding capability can serve two additional purposes, protection of the captured image and secure transmission of its depth map.

"Efficient image copy detection using multi-scale Fingerprints",by H. Ling, F. Zou, W. Q. Yan, Q. Ma, and H. Cheng

A multi-scale scale-invariant feature transform (SIFT) descriptor can help improve our ability to discriminate between images when using copy detection to identify illegal image copies.

"Image replica detection system utilizing R- trees and linear discriminant analysis", by Nikolopoulos, Zafeiriou, N. Nikolaidis and I. Pitas

The system uses color-based descriptors in order to extract robust features for image representation. These features are used for indexing the images in a database using an R-Tree. Then, in order to obtain a single result and at the same time reduce the number, of decision errors the system is enhanced with Linear Discriminant Analysis (LDA).

"Efficient expanding F- Algorithm for Image Copy Move forgery detection", by G. Lynch

An efficient expanding block algorithm for detecting copy-move forgery and identifying the duplicated regions in an image. Experimental results show that this method is effective in identifying size and shape of the duplicated region. Furthermore, it allows copy-move forgeries to be detected, where the copied region has been manufactured slightly lighter or darker, under JPEG compression, or with the effect of Gaussian blurring, in an attempt to throw-off detection algorithms.

"Exposing digital forgeries by detecting duplicated image regions" by A.C Popescu and H. Farid

This technique automatically detects duplicated regions in a digital image. This technique works by first applying a principal component analysis to small fixed size image blocks

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to yield a reduced dimension representation. This representation is robust to minor variations in the image due to additive noise. Duplicated regions are then detected by lexicographically sorting all of the image blocks.

III IMAGE FORGERY TYPES

Picture modifying is portrayed as including, changing, or erasing some significant highlights from a picture without leaving any undeniable follow. There have been various strategies used for forging a picture. Considering the strategies used to make forged pictures, advanced picture imitation can be detached into three essential categories: Copy-Move forgery, Image splicing and Image resampling.

Copy-Move Forgery

In copy-move forgery, some piece of the image of any size and shape is reordered to another zone in a similar picture to cover some significant information. As the replicated part began from a similar picture, its basic properties, for example, clamor, shading furthermore, surface don't change and make the acknowledgment procedure problematic.

Image splicing

Image splicing uses cut-and-paste systems from one or more images to create another fake image. When splicing is performed precisely, the borders between the spliced regions can visually be imperceptible. Splicing, however, disturbs the high order Fourier statistics. These insights can therefore be utilized as a part of distinguishing forgery.

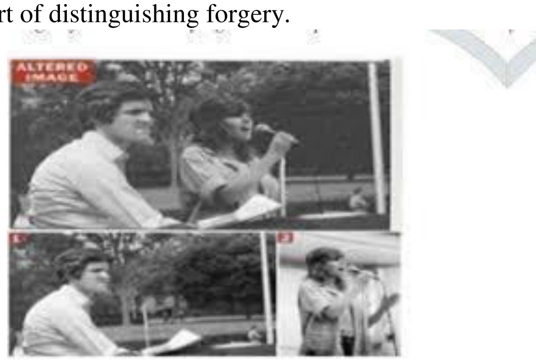


Image Re-sampling

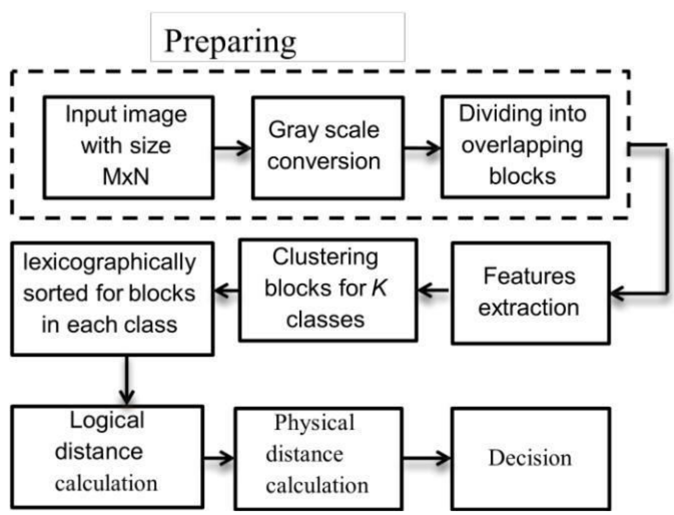
To make an amazing produced picture, some chosen areas need to experience geometric changes like pivot, scaling, extending, slanting, flipping, etc. Resampling brings explicit intermittent relationships into the picture.

IV SOFTWARE USED

The name MATLAB stands for Matrix Laboratory. It is used for efficient numerical computation and visualization. The MATLAB is used to implement the concepts in Digital Signal Processing. This platform is also used to implement image processing. It involves mathematically written codes without involving traditional coding. This is a highly efficient and supreme method of processing any image or signal when compared with traditional ways. This platform comprises of editor window, command window, workplace and current folder. It is a high-performance language used for easy computing of problems. This platform also paves a way for prototype building and for building any application.

V PROPOSED

WORK 1. Block diagram



2. BLOCK DIAGRAM EXPLANATION

Input image with size MxN

The procedure includes coordinate obtaining of pictures from any equipment sources or from any database which has been as of now nourished. This is the initial phase in the work process of picture handling. The input image is obtained through the function “imread”.

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Grayscale conversion

The grayscale picture has spoken to by luminance utilizing 8 bits esteem. The luminance of a pixel estimation of a grayscale picture ranges from 0 to 255. The transformation of a shading picture into a grayscale picture is changing over the RGB esteems (24 piece) into grayscale esteem (8 piece). Grayscale is basically lessening unpredictability from a 3D pixel worth (R,G,B) to a 1D esteem. Numerous undertakings don't admission better with 3D pixels.

Dividing Into Overlapping Blocks

The image is dived into overlapping blocks for further processing. This is done using the function "**cell2mat**".

Feature Extraction

The features of the image include color, texture, morphology, edges etc. Initially some data is measured and by using it some derived values are obtained that gives some information about the image. Feature extraction a kind of dimensionality decrease that proficiently speaks to intriguing pieces of a picture as a conservative element vector. This methodology is valuable when picture sizes are enormous and a decreased element portrayal is required to rapidly finish errands, for example, picture coordinating and recovery. Feature detection, feature extraction, and coordinating are regularly consolidated to take care of normal PC vision issues, for example, object discovery and acknowledgment, content-based picture recovery, face identification and acknowledgment, and surface characterization.

Clustering Of Blocks

Image segmentation assumes a noteworthy job in PC vision. It targets separating significant items lying in the picture. For the most part there is no interesting technique or approach for picture division. Clustering is an amazing procedure that has been come to in picture division. The clustering investigation is to parcel a picture informational collection into various disjoint gatherings or groups

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Lexicographical Sorting

In order to improve the accuracy of matching, a lexicographical sorting algorithm based on distance is proposed. Lexicographical sort calculation dependent on discrete cosine change (DCT) is created to recognize duplicate move fraud. Right off the bat, the picture is part into 8*8 squares, and the picture information experiences a DCT. At that point the DCT coefficients were assembled to decrease the measurement as indicated by the recurrence property. At last, the separation of eigenvectors, rather than the DCT coefficients, was taken as the eigen value to satisfy the square coordinating. It is robust to post image processing like adding noise and blurring.

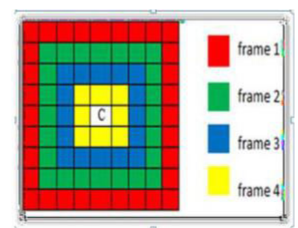
Distance Calculation And Decision

From the logical and physical distance calculation the forged area in image is identified and represented as white blocks.

VI ALGORITHM

BLOCK MATCHING

The method proposed here is Copy- Rotate-Move Forgery Detection based on Spatial Domain (CRMS). It is efficient and fast for detecting Copy-Move regions even when the copied region has undergone rotation modification in spatial domain**.** We detect the duplicated regions by **Block Matching** strategy, where the image is divided into equal-sized overlapped blocks of pixels, and then each block is compared with all other possible blocks in the same image to verify if the set of blocks of pixels in a region matches with another block in a different region of the same image. Features are extracted from each block by dividing into nested frames and the average of each frame is calculated.



VII Result and Discussion

When we simulate the program the input image that is chosen by us is displayed

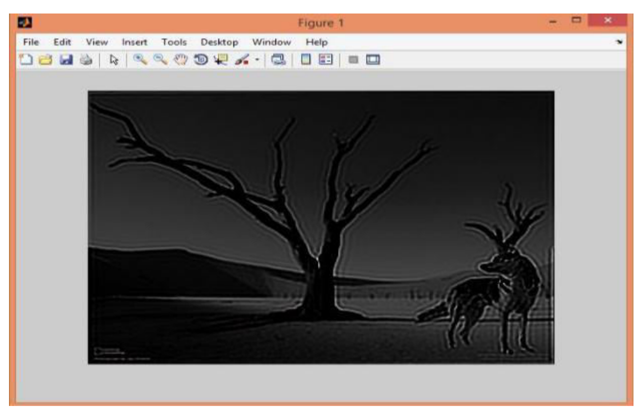


FIG 5.1: INPUT IMAGE

The output image displays the forged area in the image.

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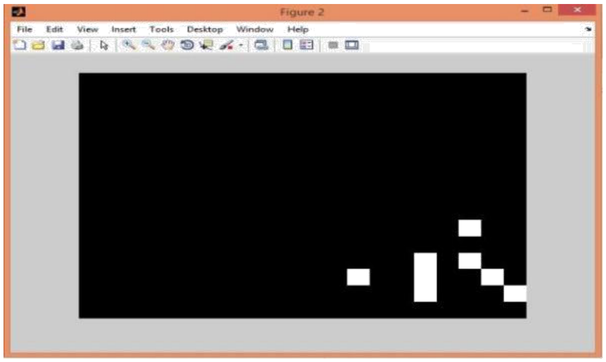

FIG 5.2: OUTPUT IMAGE

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