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I MAS Framework For Image Plagarism Detection in System Architectures (Image Multi-Agent System)

Sheetal Sapate[1], Prof.S.Z.Gawali[2] , Prof.Dr. D.M.Thakore[3]

[1]Research Scholar, BVDUCOE, Pune-43 (INDIA)

[2] Professor and Head, BVDUCOE, Pune-43 (INDIA)

[3]Professor and Head, BVDUCOE, Pune-43 (INDIA)

ABSTRACT

Image Plagiarism has been overlooked while evaluating research articles. Most intelligently adopted plagiarism pattern copying text as image in research articles. Architecture diagrams have been copied from one research article to other completely or in forged way. Commonly architecture design and system overview diagrams have been plagiarized in partially or completely. Detecting image plagiarism is challenging task as image morphology is complex. Exiting image forgery detection system detects common patterns like resizing ,cut paste. Proposed system is designed on Image Multi-Agent Framework, assisting decision support in detecting intelligent plagiarism patterns for system architectures. Four phase algorithmic procedure with layer architecture are innovations of system. Correlation similarity enhances system output

Keywords:- Image Plagarism detetcion, Image Morphology, Multi-Agent , Image forgery, Image Copy paste

1.INTRODUCTION

Image is represents concept, idea, Methodology of research in detail. Blueprints of software present Architectural style of software Architect. In current Academic Research Environment it has been observed that Architecture Forgery is common and done with Image alteration tool like image cutter etc.

Most of Existing Tools only consider text plagiarism and Discard image plagiarism while considering similarity Index.

As Such need exists for Image Plagiarism detection at Research level. Image Plagiarism act is been stated on portal [1] as:

- Embedding image, video or musical note with authorship permission and appropriate referencing
- Copying images from web portals without permission.
- Similar alike copying Visual Architecture of scholar's work.
- Forging Image parameters like height, width, cropping and merging images.

Deep Analysis carried out in 11Months suggest to find that Post graduate students , Doctoral scholars in order to bypass plagiarism scan generate image based text documents which is misleads research community . This challenge remains majorly unaddressed. This Research article focuses primarily to solve this issue.

Image Plagiarism Associated research questions

- Tow Scholars can focus to solve same research problem but cannot have same Architecture Style
- System with different Architecture style should show different outcomes.
- Alternative Architectural pattern enhances system performance and as such should be unique.

Images are faster means to represent idea. Image authenticity is at stake due advanced image manipulation tools like adobe, image cutter .etc. numerous tools are coming on daily bases which assist users to alter image images easily.

Image forensics is highly research area in social networks, medicinal prescriptions, new reports and law cases.

Figure 1 presents common kind of manipulations done in pictures

Figure 1: Image Manipulation "Copy move"

Copy–move image is commonly observed image manipulation process adopted by plagiarist for changes images, this case image parts are been copied and pasted on other parts [13].

Image plagiarism is been categorized with source of as following

- Web images copied from websites
- Company websites images without permission
- Doctoral Thesis Image copying
- Manipulating and forging pictures
- System overview flow graphs tables been copied
- Mathematical Equations been copied

Plagiarism detection system are been classified in accordance to methodology as [13]

- Active Image Plagiarism Detection
- Passive Image Plagiarism Detection

In Active Methodology, previous information about image authentication is been processed. Digital watermarks and digital signatures are been used for image code generation.

In passive Methodology, no signs exist of image modification but mathematical analysis examination reveal forgery in images. Future image plagiarism is been subcategorized as splicing forgery, brightness alteration, resampling effects [13].

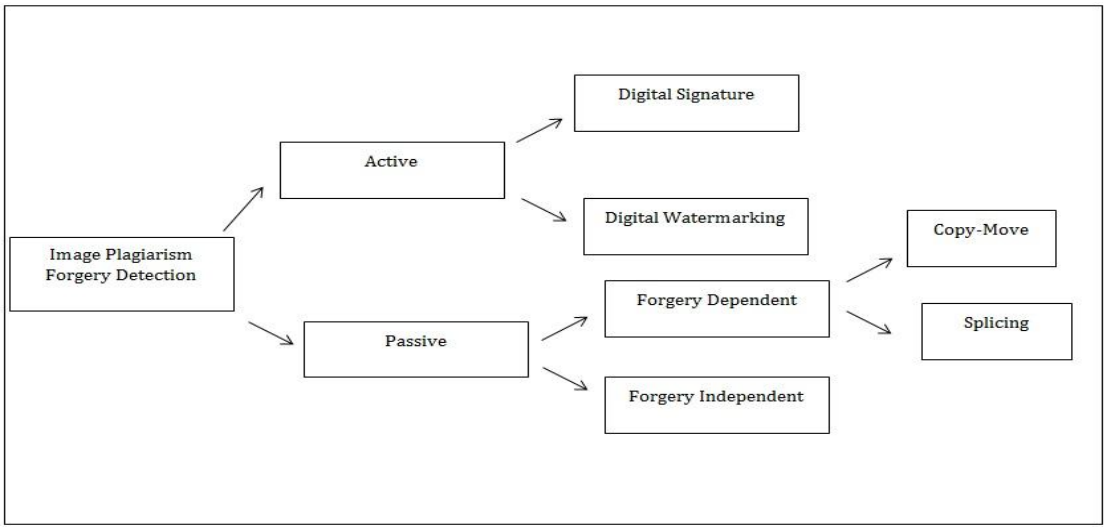


Figure 3: Categorization of Image Plagiarism

Finding Plagiarism in image focuses to evaluate research work based on architectural patterns. Finding image forgery patterns which are intelligently done by scholars. Proposed System presents innovative Methodology designed on Multi-Agent Framework which enforces parallel processing with decision support system. Image Attributes like grayscale, RGB ratios are been correlated with Pearson correlation.

System presents Image similarity report with ranked images List. Architecture dataset of 100 Images has been used in research evaluation.

Research paper first two section display what and why image plagiarism finding scope of work section Three core methodology with proposed system Architecture is been displayed. Finally, heuristic evaluation of system performance is been done and future scope is been highlighted.

2.LITERATURE SURVEY

Survey

Article **[3**] presents elaborative survey on existing Image Plagiarism Detection techniques. Methodology exists dependent on blur ratio calculation, SIFT algorithmic procedures, Principal Part Analysis, effective scaling rotating effects. It has been observed that every existing technique only Apply one of image mining process and lack a collaborative methodology. Existing System suffer drawback like time complexity, duplicate part handling, higher false ratio. Scope of work is image plagiarism detection system implementing varied geometric transformation and better accuracy with low false ratio.

Research **[4]** presents plagiarism detection based on hierarchical feature extraction with neighbor match-making. System handles all kinds of images and capable to find scaling forgery in images. System is CBDIR system that has been extended to image plagiarism detection. Core algorithmic procedure is perceptual hashing and SIFT .LHS handling enhances system performance. Future scope is implementing K-means multiple clustering mapping with map reduce. Effective balance between time and accuracy needs to be achieved.

Intelligent pattern forgery detection methodology has been presented by **[5].** OCR technology is used to read images. Core Methodology is identification of relationship between text and images and identifying forged parts.2-gram with Euclidean distance are two techniques used in accurate system performance. System detects all levels of plagiarism. Change in color and image parameters are been identified. Additionally System could be enhanced for all types of bar graph like 3D .

[**6]** Research work has developed specialized image plagiarism detection tool called as FTIP . The Tool is based image database match making . major issues handle are search complexity and search space. Core technique used is F-Transformation reducing space to search. Fuzzy closeness is been detected in between images. Limitation observed is small dataset usage. Future scope of work is realistic dataset with GPU Implementation.

Research presents **[7]** image plagiarism detection in research articles and scientific papers .Most of existing tool like Turnintin overlook image plagiarism and are based on image to image match ,lack image forgery detection. Proposed methodology is based on preprocessing images thinning images and detecting image forgery. Small dataset is only been tested. Generalization for all image formats

Research work [**8]** present extension of CBDIR System to plagiarism detection . Core methodology implemented is image search with CBDIR and forgery detection using background change, dimension reduction, shearing of images. Limitation observed is small image set, indexing mechanism would reduce search space.

Human fogies in image has been handled in **[9].** Copy move process is commonly used in image tampering hiding vital image specification. Block move algorithmic process is been initiated for forgery detection in images . Gaussian evaluation is been done for effective detection. Smallest to smallest image changes are been detected with this image manipulation technique. Future scope is to increase positive results ratio.

Image plagiarism detection technique based on fuzzy logic is been introduced by **[10].** Complex tampering detection is difficult task and as such research presents technique to handle this forgery. Numerous tools that are available in image processing are been checked for forgery detection. Conclusion suggest that no two techniques exists that could handle better image plagiarism detection. System has been tested in Mat lab and needs to be checked in real time processing.

Passive image plagiarism detection technique is been presented in [**11].** As existing techniques only detect bling forgery and require better image copy detection. Core methodology implemented is DCT, DWT. Classifier has been implemented for better processing.

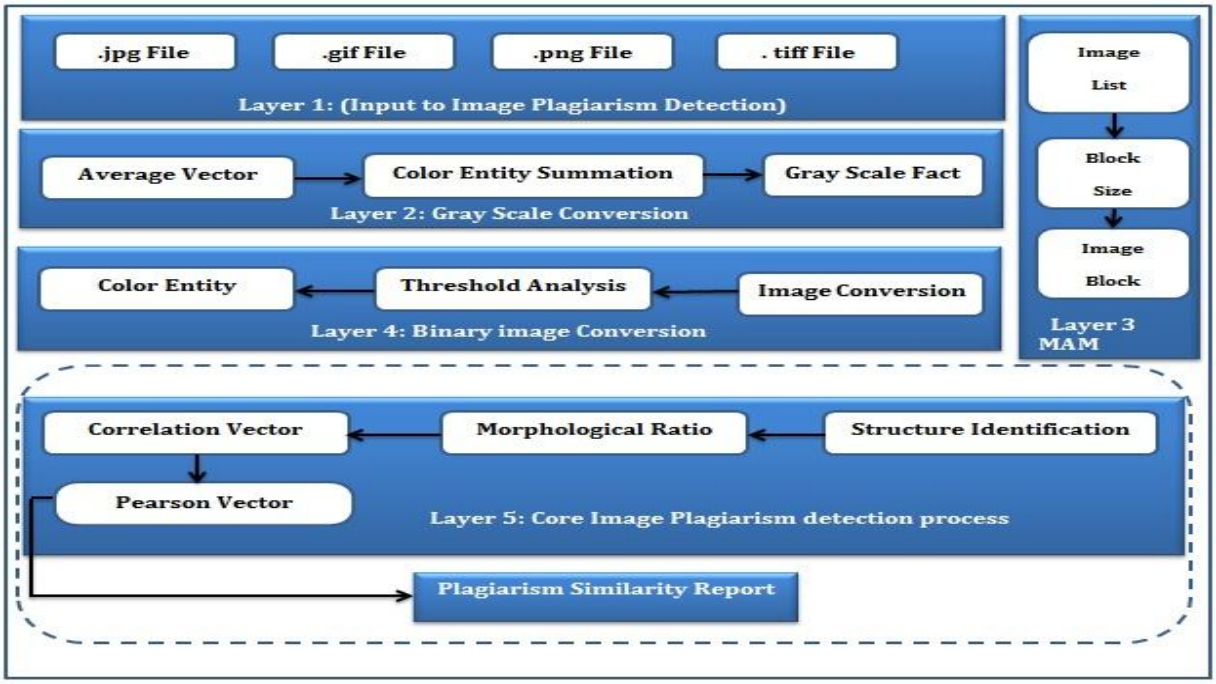
Research work **[12]** implements DWT and SIFT algorithmic procedures for tamper detection .core technology implemented is LL,HH,LH transformation using SWIFT procedure. Fine tampered regions are been detected in Image plagiarism detection. Scope of work is accuracy enhancement.

Article **[14,15,16]** commonly focus on image modification detection using image feature extraction applying SWIFT or DWT algorithmic procedures . Major limitation observed is no single procedure can handle complete plagiarism detection. Scope of work is design and development of comprehensive plagiarism detection technique towards accurate image forgery identification.

Table I Existing Image Plagiarism techniques as presented in [3]

Author	Year	Method Used	Drawbacks
Mahdian and Saic [13]	2007	Used blur moment invariants to represent image regions as a result of they can't be tormented by blur degradation and additive noise.	The computation time of the algorithmic program is relatively high.
Wang, Liu, Zhang, Dai and Wang [14]	2009	Conducted a study on copy-move plagiarism detection by victimisation Hu moments.	Their methodology is self-made in sleuthing copy-move plagiarism even once post-processing is completed.
Mohamadian and Pouyan [15]	2013	Delineate new methodology of sleuthing copy-move plagiarism by victimisation SIFT algorithmic program at the side of Zernike moments.	Their methodology was able to determine the potential geometric transformations performed.
Popescu and Farid [16]	2004	Discover copy-move plagiarism to with by applying PCA (Principal part Analysis).	The potency falls because the block size decreases and additionally if the standard of the image is low.
Ting and Rang-ding [17]	2009	Projected a copy-move plagiarism detection methodology victimisation	They used lines to attach 2 identical blocks in an exceedingly figure that clearly shows the tampered
Zimba and Xingming [18]	2011	Projected a replacement methodology of copy-move plagiarism detection	The sole disadvantage is that the duplicated region ought to be larger than the block size, otherwise it can't be detected.
Bravo-Solorio and Nandi [19]	2011	A study on copy-move detection technique to seek out forgeries involving reflection, rotation and scaling.	Their methodology produces heap of matches; thence they used refinement to scale back them.
Sridevi, bone and Sandeep [20]	2012	Proposes a copy-move Plagiarism detection technique in an exceedingly parallel setting.	They controlled the false detection rate by adjusting the block size. However, their methodology can't be applied for a colour image.

3.PROPOSED METHODOLOGY



Layer 1: Accepts input to Image Plagiarism detection .Image formats like JPEG, TIFF, GIFF ,PNG are been accepted by System.

Layer 2: Gray conversion algorithmic process is been implemented at this layer. Initially dimensions of image are been computed and pixle P(x,y) is been computed in vector space. Red Blue and Green values are been extracted from images. Applied equation I gray scale value is been computed for given image.

Layer 3: Multiple Image agents are been dynamically initialized as per requirement which divide given image in blocks from input dataset images for future matching.

Layer 4: Implements algorithmic procedure of Binary image conversion. This process black and white pixels are been extracted to compute binary image . Pressure points are been discarded with this process.

Layer 5: core match Methodology is been implemented based on Image morphology

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Algorithm I: GRAY CONVERSION PROCEDURE

Step 1:. Start

Step 2. Get Image path.

Step 3. Get Length and width of the Image (L*W).

Step 4: FOR pixels from 0 to width.

Step 5 :FOR pixels from 0 to Length.

Step 6:Get a Pixel at (x, y) in integer.

Step 7 :. Convert pixel integer value to Hexadecimal to get R, G, and B.

Step 8:. GRAY=(R+G+B)/3.

Step 9: R=GRAY, G=GRAY, B=GRAY.

Step 10: Reset R, G, B to get Gray Scale Image.

Step 11: End of inner for loop

Step 12: End of outer for loop

Step13: Stop

Algorithm II: IMAGE BINARY CONVERTER

Step 0: Start

Step 1: Get Image path.

Step 2: Get threshold value as T

Step 2: Get Height and width of the Image (L*W).

Step 3: FOR x=0 to width.

Step 4: FOR y=0 to Height.

Step 5: Get a Pixel at (x, y) as signed integer.

Step 6: Convert pixel integer value to Hexadecimal to get R, G, and B.

Step 7: if (R>T and G>T and B>T)

Step 8: convert pixel to white color

Step 9: else

Step 10: convert pixel to black color

Step11: End of inner for

Step 12: End of outer for

Step 13 : Stop

Algorithm III: Morphology Recognition

Step 0: Init

Step 1: Image Path setup

Step 2: set Height and width of the Image (L*W).

Step 3: FOR x=0 to W.

Step 4: FOR y=0 to H.

Step 5: Get a Pixel at (x, y) in integer values.

Step 6: Convert pixel integer value to Hexadecimal to get (R,G,B).

Step 7: if (R!=255 and G!=255 and B!=255) (checking for Image pixel)

Step 8: Get the Y value for the pixel

Step 9: Then ratio Rt= Y/Height

Step 10: Add Rt into an array called RA

Step11: End of inner for

Step 12: End of outer for

Step 13 : Stop

Evaluation time of images are always larger than that of text, this makes more concern about our concept of image plagiarism. So to deal with the increasing time complexity our system uses multi agent concept to divide the available number of images in the database into blocks which are eventually loaded to the multithreads for the faster computational task.

4. CONCLUSION AND FUTURE SCOPE

Proposed Image Plagiarism detection system identifies partial and completely plagiarized architectures and system design from research articles of scholars. System has been tested for commonly used image formats.
Future system can be enhanced to work on all image formats and image morphology could be made accurate. Distributed computing and additional morphological transformation are future scope of work. Future Scope in Integration of E MAS for Text Plagiarism detection and I MAS Framework.

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