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Image Piracy Detection on Social Media Platforms such as Instagram and Facebook

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Abstract: ***Image piracy detection is a pressing issue on social media platforms such as Instagram and Facebook. This issue revolves around the unauthorised use of someone else's images without their permission, a practice that not only compromises the integrity of creators' work but also leads to copyright infringement and violations of intellectual property rights. An application designed to detect image piracy could prove highly beneficial, particularly for photographers, artists, and various other creators who depend on their images for their livelihoods. The primary purpose of such an app is to safeguard the artistic and intellectual property rights of creators, ensuring that their work is not exploited without their consent. Developing a robust image piracy detection app would serve as a critical tool for creators, offering protection against the misuse of their content. In practice, this means the app scans the platform for instances of potentially plagiarised content and promptly notifies the content owner. For creators, this kind of solution is essential, as it allows them to focus on their creative endeavours with confidence, knowing that their work is less likely to be stolen or profited from without their knowledge. It represents a shield against the unlawful reproduction of images and provides a legal basis for action in case of copyright infringement.***

Image piracy detection app is the prevention of unlawful profits. Unauthorised use of someone else's images often results in financial losses for creators. These apps play a pivotal role in mitigating such losses by flagging and addressing instances of infringement.

Additionally, they educate users about the proper use of content, fostering a culture of respect for creators' rights and fair content usage. Furthermore, the presence of these tools acts as a deterrent, discouraging potential infringers from misusing images in the first place, which, in turn, reduces the occurrence of piracy.

Keywords/Index Terms: Image Piracy Detection, Social Media, Instagram, Facebook, plagiarised.

I. INTRODUCTION

In today's digital age, social media platforms such as Instagram and Facebook have revolutionised the way we share content, particularly images. These platforms provide creators with an exceptional opportunity to showcase their work to a global audience, offering unprecedented exposure and recognition. However, this immense digital landscape also comes with a significant challenge – the pervasive risk of image piracy. The unauthorised use of images without the creator's consent is a pressing concern, as it can result in copyright infringement and violations of intellectual property rights. Content creators invest their time, creativity, and resources into producing these images, making it vital to protect their work from being exploited without permission.

To address this issue, a proactive solution has been developed - an application designed to detect image piracy on major social media platforms such as Instagram and Facebook. This application relies on advanced image recognition techniques to meticulously scan and identify potentially infringing images. Once a suspicious image is identified, the app empowers users to take various actions, including reporting the image to platform administrators, issuing a takedown notice, or, in more severe cases, considering legal action. By providing a suite of options to content creators, this app acts as a critical tool in safeguarding their intellectual property rights and maintaining the integrity of their work in the digital realm.

The landscape of social networking sites has evolved dramatically, with their growing popularity granting users a more extensive and influential platform for content sharing. However, this also opens doors to misuse and misappropriation, allowing individuals to post content, including images that they do not have rights to use. This project's specific focus is on image plagiarism detection, especially within databases generated from content posted on social media platforms like Instagram and Facebook. While existing plagiarism detection systems are adept at identifying text-based plagiarism, flow-chart plagiarism, or similarities with content available elsewhere on the internet (excluding social media), there remains a substantial gap in the realm of identifying plagiarised images specifically within social media platforms.

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II. LITERATURE REVIEW

1) The paper proposed by Lomborg, Stine; Bechmann, and Anja[3], highlighted the APIs provided by companies like Instagram and Facebook and how they set certain limitations to the collection of data and their privacy policy, along with information like what kind of data can be extracted. It was also understood that the data extracted from APIs are not 100 percent reliable because it's the developers who decide the data relevance.
2) In the paper proposed by Zubair Ahmed1, Prof. Mausumi Goswa[4], The power of Facebook API, and Facebook graph API was discussed in detail, understanding that using Facebook graph API we can access any kind of data including photos, videos, posts, etc. Graph API is a low-level HTTP-based API to get or post data through different techniques asks than normally an application would. Most Graph APIs an application can request by getting an access token by implementing Facebook Logins. CCEW, Department of Computer Engineering 2022-23 17
3) The system in the paper proposed by S, Akshay & B N, Chaitanya & Kumar[5], and Rishabh constitutes 80 images that are extracted from research papers through a third-party website. The images have been pre-processed using Compression, Re-sizing, and Binarization. The results obtained through comparison using subtraction are quite accurate. The F-measure value obtained is 70%. The drawback of this system is that it cannot detect plagiarism on images that are cropped to vital content.
4) The system in the paper proposed by S Sowmya Mithra, and K P Supreethi[6] works for images that are of different sizes, brightness, background, and grey-scaling (doesn't work for A Hash computation). This system uses the Hash value computation technique to find similar images. Images are retrieved along with the hash value differences as well as a graphical representation of the same. The drawback of this system is that it works only for assignmentsubmitted images and has no mention of the numeric accuracy of the system.
5) The system proposed by Prajakta Ovhal [7] used the CBIR technique. This system consisted of 3 stages which included the pre-processing stage, feature extraction stage, and comparison stage. The feature extraction stage was then divided into 2 main parts which are color feature extraction(HSV color space) and shape feature extraction. The system used the Euclidean distance formula to calculate the similarity between any 2 images. After the comparison between the images, the results displayed were sorted using merge sort in decreasing order of similarity index.
6) In this paper by Ibrahin,[8] an improved system for the detection of plagiarism of images was proposed. The feature extracted were color features, texture features (Tamura), and Shape features (Canny Edge). The results showed were ascending order of the similarity index and whether it is true or false. The accuracy was 100% for unedited images and differed for different variations in images.
7) This paper by P. Hurtik and P. Hodakova[1] focused on searching for plagiarized images in databases. It proposed the searching algorithm FTIP based on the F^1 -transform technique(Fuzzy Transform) which was mainly used in the preprocessing step speeding up CCEW, Department of Computer Engineering 2022-23 18 the whole process of image searching. The system showed that the proposed algorithm is very fast (approximately 100ms) with a 100% success rate for the uncropped images. Whereas they also demonstrated that a 100% success rate can be achieved also for the cropped images with a slight improvement of the original algorithm.

No.	Title	Authors	Year	Results
[1]	FTIP: A tool for image plagiarism detection.	Hurtik, Petr, and Petra Hodakova	2015	Focuses on looking for plagiarised images in databases. We proposed the F T I P searching algorithm, which was based on the F1-transform technique and was primarily employed in the preparation step. The pretreatment phase has been shown to be highly important: it is only computed once and reduces the domain dimension. As a result, this phase dramatically accelerates the entire image search process.

[2]	Image plagiarism detection using compressed images.	Akshay, S., B. N. Chaitanya, and Rishabh Kumar	2019	taken a data set of 80 images which are extracted from research papers through a third party website pdfaid.com. The results obtained through comparison are quite accurate. The F measure value obtained is 70%. The drawback of this system is that, it cannot detect plagiarism on images which are cropped till vital content. The future work on image plagiarism can be implemented on detection of plagiarism of cropped images and re-sized images using advanced techniques. Extraction of images directly from PDF can be done rather than manual technique.
[3]	Detecting plagiarism in images	Ovhal, Prajakta	2015	The CBIR system with fused features demonstrates that it can collect enough positive findings to be utilised as a tool for identifying image plagiarism, with definitions of plagiarism simulated by a modification to the database photos from the Spanish-language Wikipedia.Finally, we observe that combining features enhances the system, allowing us to utilise it as a general-purpose engine, and with some additional effort, it may be able to meet our goal of adding an image analysis component to our present plagiarism detection system.
[4]	Online Plagiarism Detection for Images	S SOWMYA ,MITHRA K P SUPREETHI	2021	Plagiarism detection is critical for safeguarding written material. All institutes, students, and professors must be aware of plagiarism and anti- plagiarism techniques, it is determined. In this study, we created a simple algorithm for detecting plagiarism in student assignments, notably for photographs. It has a high detection rate and can rapidly and efficiently check a large number of assignments.
[5]	Plagiarism Detection of Images.	Ibrahin, Amirul S. Bin, Othman O. Khalifa, and Diaa Eldein M. Ahmed.	2020	Colour is extracted from photos and saved to databases using the RGB and HSV colour spaces, texture using the Tamura texture, and form using the canny edge technique. The results were displayed in ascending order of similarity index and true/false. However, in the case of unprocessed photographs, the accuracy is 100% and varies in other processes such as flipped, rotated, greyscale, and cropped.

[6]	Image Data Augmentation for Deep Learning	Shorten, C., Khoshgoftaar, T.M	2019	The application of search algorithms that combine data warping and oversampling techniques has immense promise. Deep neural network layered architecture provides numerous potential for Data Augmentation. The majority of the augmentations investigated act in the input layer. Some, however, are generated from hidden layer representations, and one approach, DisturbLabel, is even visible in the output layer. The space of intermediate representations and the label space are both under- explored Data Augmentation topics with promising results.
[7]	Design of feature extraction in content-based image retrieval (CBIR) using colour and texture	Sakhare, Swati V., and Vrushali G. Nasre	2011	The enormous increase in image database size has prompted the development of effective and efficient retrieval technologies. The application uses colour, texture, and shape to do a simple colour-based search in an image database for an input query image, returning photos that are similar to the input image as the output. Depending on the amount of similar photographs in the database, the number of search results may vary.
[8]	Content-based image retrieval using colour and shape features	Chaudhari, Reshma, and A. M. Patil	2012	The growing usage of images in a variety of applications has prompted the development of highly efficient and effective image retrieval systems. This resulted in the creation of a content-based image retrieval system, or CBIR. CBIR would retrieve images based on their visual information, such as colour, texture, shape, and so on, rather than written annotation. The ideal advantages of a CBIR system include reduced retrieval time and increased system efficiency. As a result, a system that can automatically extract meaningful objects from a large dataset must be constructed.
[9]	Discrete fuzzy transform of higher degree	Holcapek, Michal, and Tomáš Tichý	2014	Higher degree discrete version of direct and inverse multivariate fuzzy transform.Similarly to , we employed matrices to introduce the direct Fm-transform via multivariate polynomials, and we demonstrated that our definition of multivariate polynomials leads to an improvement of the standard functional with respect to the weighted least square error criterion. Furthermore, we demonstrated that at higher degrees, multivariate polynomials provide a better quality of approximation of the original function. Finally, we presented the inverse continuous Fm-transform and deduced some fundamental facts. On financial data, we demonstrated the discrete technique to Fm- transform.

[10]	The power of Facebook API	Zubair Ahmed1, Prof. Mausumi Goswami, Prof. K. Balachandran	2014	The Open Graph Protocol and the Graph API harness the power of hypermedia to demonstrate the feasibility of creating simple representations of linked resources; in this case, the Facebook object. We can see how valuable and powerful these tools are, and how they have the potential to revolutionise the world of online semantics.

III. CONCLUSION

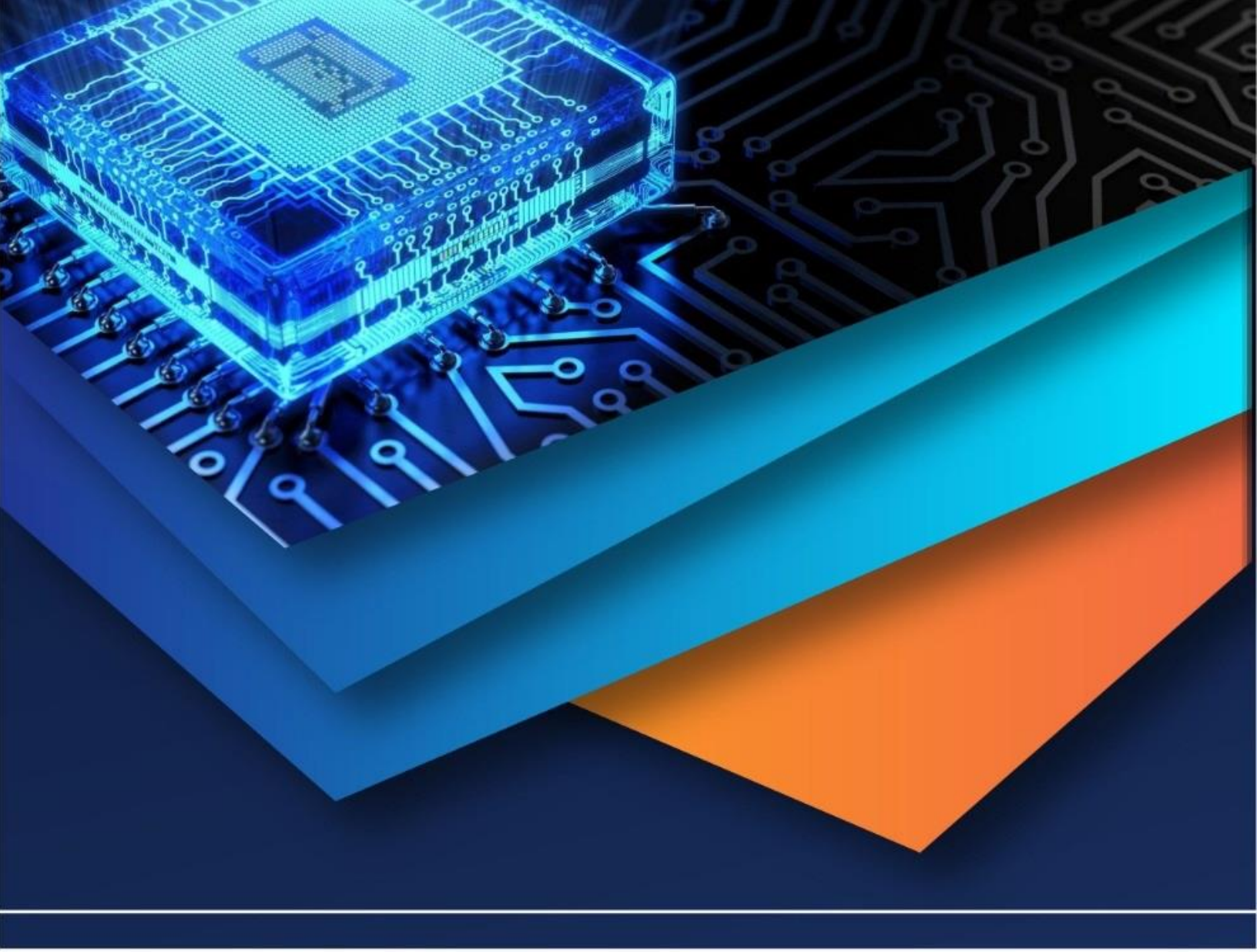
The implementation of this project has significant implications for copyright protection on social media platforms. By automating the process of detecting image piracy, it reduces the burden on copyright holders and improves the efficiency of identifying copyright infringements. This system not only benefits individual creators and copyright owners but also contributes to maintaining a fair and ethical online environment.

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