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Enhancing Image Forgery Detection: A Novel Method for Content-Preserving Forgeries using Machine Learning Algorithms

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Abstract -Digital image forgery has become a significant concern due to the ease of manipulating and distributing digital media. Content-preserving forgeries are particularly challenging to detect, as they maintain the visual integrity of the original image while altering its content. In this research paper, we propose a novel image forgery detection method that combines Support Vector Machines (SVM), Convolutional Neural Networks (CNN), and ensemble classifiers to enhance the accuracy and reliability of forgery detection.

Keywords - Machine Learning Algorithms, SVM, CNN, Image Forgery Detection

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INTRODUCTION

The rapid advancement of digital image editing tools has made it easier for individuals with malicious intentions to tamper with digital images. Content-preserving forgeries pose a significant threat, as they are difficult to detect visually. To address this challenge, we propose a comprehensive image forgery detection method that leverages the power of SVM, CNN, and ensemble classifiers.

RELATED WORK

We review existing literature and research efforts in the field of digital image forgery detection. We analyze the strengths and limitations of various methods, including traditional techniques and machine learning-based approaches.

PROPOSED METHODOLOGY

We present our novel approach, which consists of multiple stages. Firstly, we preprocess the input image to extract relevant features that can reveal signs of forgery. We employ a combination of handcrafted features and deep learning-based feature extraction using CNNs. Next, we use SVM as a binary classifier to detect potential forged regions in the image based on the extracted features. Finally, we employ ensemble classifiers to combine the results of multiple SVM classifiers to improve the overall accuracy.

EXPERIMENTAL EVALUATION

We conduct extensive experiments on a diverse dataset comprising both authentic and forged images. We compare the performance of our proposed method with existing state-of-the-art forgery detection techniques. We evaluate the accuracy, precision, recall, and F1-score of our approach to demonstrate its effectiveness.

RESULTS AND DISCUSSION

We present the experimental results and discuss the performance of our proposed method in detail. We analyze the strengths and limitations of our approach and provide insights into its effectiveness in detecting content-preserving forgeries.

CONCLUSION

We conclude by summarizing the contributions of our research and highlighting the advantages of our novel image forgery detection method. We discuss future directions and potential enhancements to further improve the accuracy and efficiency of content-preserving forgery detection.

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