

Detecting Manipulated Visuals with AI

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Abstract

With the rapid advancement of digital media and easy access to sophisticated editing tools, image forgery has become a widespread issue. Image forgery involves manipulating images to deceive viewers or alter visual facts. Image forensics is the field dedicated to identifying such forgeries, and it can be classified into two primary techniques: active protection and passive detection. Active protection relies on methods like watermarking and digital signatures to verify authenticity. In contrast, passive detection, which does not require prior information about the image, focuses on identifying inconsistencies through analysis techniques. Two of the most common forms of image forgery are Image Splicing and Copy-Move Forgery. Image Splicing refers to combining parts of different images into a single image, while Copy-Move forgery involves copying a part of the image and pasting it into another section of the same image. Both techniques are commonly used to alter the meaning of an image or hide critical details. This project delves into the methods used to detect such forgeries. In this study, we focus on the application of machine learning and deep learning techniques, particularly Support Vector Machines (SVM) and Convolutional Neural Networks (CNN), to detect forged images. The SVM classifier is used to analyze and classify image features that indicate forgery, while CNN models, known for their ability to process visual data, are trained to identify subtle

irregularities within images that may not be visible to the naked eye. Given the rise in image manipulation, the development of robust detection tools is more crucial than ever. This project aims to review these techniques and evaluate their effectiveness in distinguishing authentic images from forged ones, providing a critical foundation for future research in image forensics. This version expands on your initial idea, emphasizing the problem, techniques involved, and the importance of using modern detection methods like SVM and CNN

Keywords

Detecting, Manipulated Visuals, AI, Convolutional Neural Networks