

FAKE CURRENCY DETECTION
USING
DIGITAL IMAGE PROCESSING

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INTRODUCTION

Fake currency detection using digital image processing is a critical application that plays a significant role in maintaining the integrity of financial systems and preventing economic fraud. In recent years, advancements in digital image processing techniques have revolutionized the way counterfeit currency is identified and thwarted, offering a reliable and efficient solution to combat this growing concern. The proliferation of sophisticated printing technologies has made it increasingly challenging to distinguish genuine currency from counterfeit notes. However, digital image processing algorithms have proven to be highly effective in analysing various features and patterns present in currency notes, allowing for accurate and swift detection of fake currency. One of the primary techniques used in fake currency detection is image segmentation, where the currency image is divided into meaningful regions or segments based on attributes such as colour, texture, and intensity. This process helps isolate specific features like watermarks, security threads, and microprints that are unique to genuine currency and difficult to replicate accurately. Additionally, digital image processing algorithms employ pattern recognition and machine learning algorithms to identify subtle differences between genuine and fake currency. These algorithms are trained on a dataset containing a diverse range of currency samples, enabling them to learn and adapt to new counterfeit patterns and variations. Furthermore, advanced techniques such as spectral analysis and feature extraction are utilized to extract relevant information from currency images, which is then analysed and compared against known patterns of genuine currency. This approach enhances the accuracy and reliability of fake currency detection systems, reducing false positives and ensuring robust performance in real-world scenarios.

ABSTRACT

Fake currency detection is a critical aspect of financial security, particularly in today's digital economy. This paper explores the application of digital image processing techniques in identifying counterfeit currency. Through image segmentation, pattern recognition, and machine learning algorithms, digital image processing plays a pivotal role in isolating unique features of genuine currency, such as watermarks and security threads, from counterfeit notes. Advanced spectral analysis and feature extraction further enhance the accuracy of detection systems, minimizing false positives and ensuring reliable performance. By integrating these techniques into currency authentication devices, businesses and financial institutions can effectively combat financial fraud, protect consumer interests, and uphold the integrity of financial transactions.