Watermarking:Using Bit-Plane Slicing

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Abstract

Digital image authentication is an extremely significant concern for the digital revolution, as it is easy to tamper with any image. In the last few decades, it has been an urgent concern for researchers to ensure the authenticity of digital images. Based on the desired applications, several suitable watermarking techniques have been developed to mitigate this concern. However, it is tough to achieve a watermarking system that is simultaneously robust and secure

Introduction

Watermarking is the process of hiding digital information about an image, audio clip, video clip or other work of media within that work. Watermarks can be visible directly to the naked eye, such as watermark images on currency notes or can be hidden digitally in the media. Watermarking is a popular solution to make the transfer of data, secure from illegal interferences. It is prominently used for tracing copyright infringements and for banknote authentication.

Different Methods of Bit plane Slicing:

1. Spatial Techniques
2. Frequency Domain watermarking
3. Spread Spectrum
4. Bitplane Slicing

Bit Plane Slicing

Digitally, an image is represented in terms of pixels. These pixels can be expressed in bits. The grayscale image contains an eightbit binary value; hence an image can be sliced up into 8-bit planes which give a sequence of binary images. In Figure 2. we can see that a grayscale image man is considered as a combination of eight bit-planes where each bit-plane can be represented by a binary matrix. Plane 1 contains the lowest order bit of all the pixels in the image, while plane 8 contains the highest order bit of all the pixels in the image shown

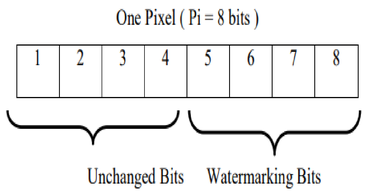

Figure 1. Bit Information of a pixel for Watermarking

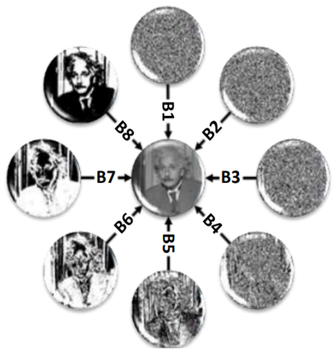

Figure 2. BPS of a grayscale image

Watermarking Insertion

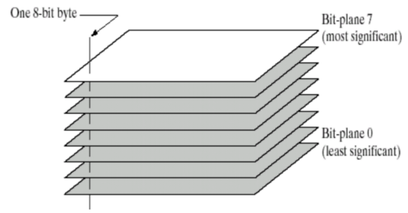

Figure 3. Bit-plane representation of an 8-bit image.

Process

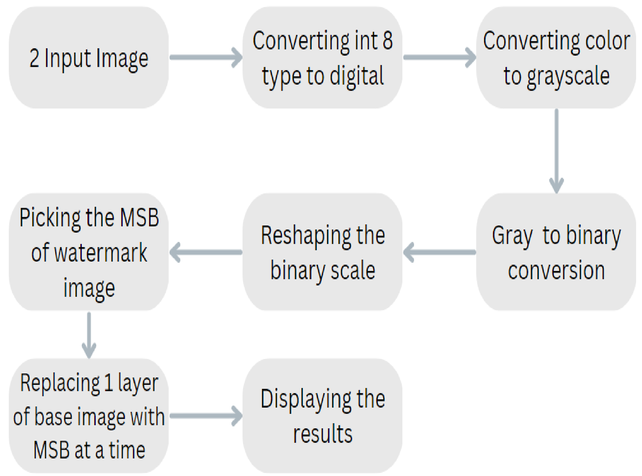

Figure 4. Flowchart

Result

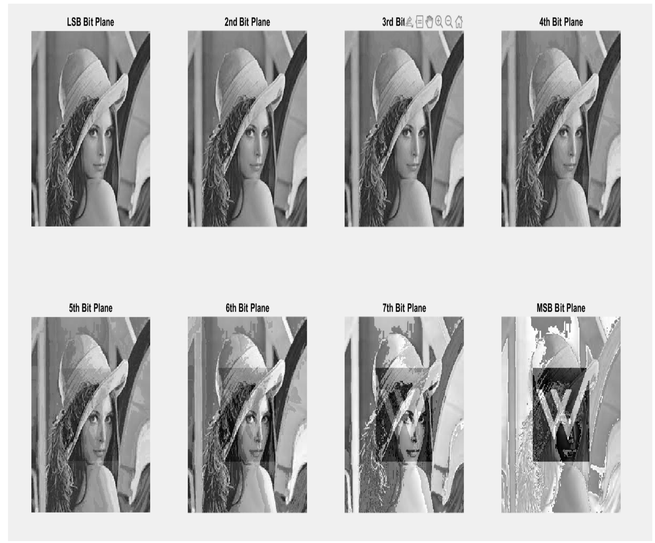

Figure 5. watermarked image using bps

Conclusion

At present, information can be duplicated easily due to the interactive and digital communication of multimedia data. This issue makes digital image watermarking a significant field of research. Digital image watermarking using various techniques has been applied as an important tool for image authentication, integrity verification, tamper detection, copyright protection, and the digital security of an image. In this study, we reviewed the most dominant state-of-the-art watermarking techniques

Future Scope

Security remains a big challenge in digital image watermarking technologies, and the accommodation of IoT and blockchainbased authentication schemes provides a challenge for researchers. Therefore, future work can be extended by combining various techniques in different domains to fulfill the requirements. Moreover, to improve robustness along with security, researchers should focus on developing new, advanced techniques

References

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