Optical Color Images Encryption based on Double Random Phase Encoding

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Abstract

Extensive studies have been carried out to develop strong encryption techniques that have played a vital role in communications and multimedia transmission. The main requirement of any encryption techniques is to get high robustness. One of the most common techniques for optical encryption is Double Random Phase Encoding (DRPE), but it was found that it suffers from weak performance against attacks especially with color images. In this paper, we will introduce three techniques, traditional, modified, and proposed one for optical encryption of colored images with various extensions and different sizes based on DRPE. As a result of the extensive comparative study, it was found that the Discrete Wavelet Transform (DWT) based DRPE provides the best experimental results from the point of view of differential attacks and statistical attacks.

References


Index Terms

Computer Science                    Image Processing

Keywords

Double Random Phase Encoding (DRPE), Fast Fourier Transform (FFT), Discrete Cosine Transform (DCT), Discrete Wavelet Transform (DWT).