Utilization of Double Random Phase Encoding for Securing Color Images

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Abstract

This paper investigates the Double Random Phase Encoding (DRPE) implementation in encrypting color digital images. The color optical image cipher works through splitting color plainimage into red (R), green (G) and blue (B) channels. The color plainimage RGB components are multiplied with the random phase mask (RPM) and transformed with Fourier Transform (FT). The modulated RGB components are again multiplied using the second RPM and subjected again to inverse FT. A set of experimental tests using different color images has been employed to study the security of DRPE for encrypting digital color images. Experimental results demonstrated the efficiency of DRPE for encrypting digital color images and its immunity regarding the most potential attacks.

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**Index Terms**

Computer Science  
Image Processing

**Keywords**

DRPE, Fourier Transform (FT), Color image encryption