

Asymmetric color information encoding based on gyrator transform domain

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A color information encryption method in gyrator transform domain that based on an asymmetric cryptosystem is proposed. In encryption process, a color image is first decomposed into red, blue and green color channels. Each of these channels are independently attached to the first random phase mask (RPM) placed at the image plane and then gyrator transformed. The transformed image is phase-truncated to get encoded image and amplitude-truncated to produce first decryption phase key. The encoded image is attached to the second random phase mask placed at the frequency plane and then again gyrator transformed. The resulted image is phase-truncated to get final encoded image and amplitude-truncated to generate second decryption phase key. The decryption phase keys provide asymmetric keys whereas the transformation angles of gyrator transform offer extra keys. Compared to previous asymmetric cryptosystem, the proposed system provides parametric precision of optical configuration and offers a high level robustness against existing attacks. Simulation results are presented to support the feasibility of the proposed method.

Biography

Muhammad Rafiq Abuturab has completed his Ph.D in Physics from Magadh University in 2008. He is an Assistant Professor in the Department of Physics at Maulana Azad College of Engineering and Technology, India. His current research includes Fourier Optics, optical transformations, optical information security systems, optical information hiding, and digital holographic architectures. He is the author of more than 10 refereed journal papers and 2 invited conference papers. He is a member of Optical Society of America and Society of Photo-Optical Instrumentation Engineers.

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