A Non-symmetric Digital Image Secure Communication Scheme Based on Generalized Chaos Synchronization System

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Abstract: Based on a generalized chaos synchronization system and a discrete Sinai map, a non-symmetric true color (RGB) digital image secure communication scheme is proposed. The scheme first changes an ordinary RGB digital image with 8 bits into unrecognizable disorder codes and then transforms the disorder codes into an RGB digital image with 16 bits for transmitting. A receiver uses a non-symmetric key to verify the authentication of the received data origin, and decrypts the ciphertext. The scheme can encrypt and decrypt most formatted digital RGB images recognized by computers, and recover the plaintext almost without any errors. The scheme is suitable to be applied in network image communications. The analysis of the key space, sensitivity of key parameters, and correlation of encrypted images imply that this scheme has sound security.

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