

Bitplanes Image Encryption/Decryption Using Edge Map (SSPCE Method) and Arnold Transform

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Abstract : Data security needed in data transmission, storage, and communication to ensure the security. The single step parallel contour extraction (SSPCE) method is used to create the edge map as a key image from the different Gray level/Binary image. Performing the X-OR operation between the key image and each bit plane of the original image for image pixel values change purpose. The Arnold transform used to changes the locations of image pixels as image scrambling process. Experiments have demonstrated that proposed algorithm can fully encrypt 2D Gary level image and completely reconstructed without any distortion. Also shown that the analyzed algorithm have extremely large security against some attacks like salt & pepper and JPEG compression. Its proof that the Gray level image can be protected with a higher security level. The presented method has easy hardware implementation and suitable for multimedia protection in real time applications such as wireless networks and mobile phone services.

Keywords : SSPCE method, image compression, salt and peppers attacks, bitplanes decomposition, Arnold transform, lossless image encryption

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