

Color Image Compression/Encryption/Contour Extraction using 3L-DWT and SSPCE Method

Authors : Ali A. Ukasha, Majdi F. Elbireki, Mohammad F. Abdullah

Abstract : Data security needed in data transmission, storage, and communication to ensure the security. This paper is divided into two parts. This work interests with the color image which is decomposed into red, green and blue channels. The blue and green channels are compressed using 3-levels discrete wavelet transform. The Arnold transform uses to changes the locations of red image channel pixels as image scrambling process. Then all these channels are encrypted separately using the key image that has same original size and are generating using private keys and modulo operations. Performing the X-OR and modulo operations between the encrypted channels images for image pixel values change purpose. The extracted contours from color images recovery can be obtained with accepted level of distortion using single step parallel contour extraction (SSPCE) method. Experiments have demonstrated that proposed algorithm can fully encrypt 2D Color images and completely reconstructed without any distortion. Also shown that the analyzed algorithm has extremely large security against some attacks like salt and pepper and Jpeg compression. Its proof that the color images 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 and salt and peppers attacks, bitplanes decomposition, Arnold transform, color image, wavelet transform, lossless image encryption

Conference Title : ICPRIP 2015 : International Conference on Pattern Recognition and Image Processing

Conference Location : Miami, United States

Conference Dates : March 09-10, 2015