

ABSTRACT

In the past few decades, telemedicine has flourished with the advancements in communication technologies. Medical images are important tool for diagnostic procedure. Now they can be easily transmitted through communication channels around the globe. However, transmission over public network is prone to infringement of security, confidentiality, copyright and integrity. Loss or tampering of medical data can lead to wrong diagnosis. Thus security, confidentiality and integrity are of prime concern during transmission of medical images. One of the efficient methodologies for the security of information from medical images is by combing the encryption and watermarking method. The main objective of this research work is to introduce an efficient watermarking and encryption approaches for improving the security and authenticity of medical images in E-healthcare application.

In this first work designed an efficient image encryption scheme for medical image security. Initially, medical images are taken as an input. The images are scrambled using Combined Linear Congruential Generator (CLCG) with Bit Rotation Operation (BRO) and the bit planes will be generated. From the generated bit planes, DNA encoding will be done which will resultant with the DNA sequences. After DNA sequence generation, decoding will be performed which will result with the recombines bit planes. These regenerated bit planes will be processed using XOR operation to generate the encrypted images. Decryption process is done by reverse process of encryption. Experimentation results showed that correlation among pixels is reduced while maximizing entropy.

In second research work, designed a robust method of hiding patient secrete data using hybridization of Arnold transform and LSB technique for

medical image At first, medical image segmentation is performed by using Fuzzy C Means (FCM) clustering. The Secret Patient Information (SPI) is encrypted using AES algorithm and inserted to cover medical image (ROI) to get a secure watermarked medical image. For better security of watermarked medical image, the Arnold Transform with LSB based watermarking is applying to ROI before sending it at the receiver end. To retrieve the medical image and patient information the watermark extraction is performed at the receiver end. The experimental results shows that the proposed system attains higher PSNR compared to previous methods LCG, CLCG-BRO, LSB based watermarking schemes.

The third work designed an efficient image watermarking with multilevel encryption for medical images. Here, natural image is considered to be the original image and medical image is embedded into it in order to avoid illegal usage of medical image. Here medical image is considered as watermark. The medical image is separated into ROI and NROI using Fuzzy C Means (FCM) clustering algorithm. Then the ROI is embedded in natural images. The watermarking is performed with the help of both Least Significant Bit (LSB) and Quantization Index Modulation (QIM) method. Finally the watermarked image is encrypted by using RC4 and AES algorithm to improve the security. The experimental results shows that the proposed system attains better performance compared with the previous system in terms of Peak to Signal Ratio (PSNR), encryption and decryption time.