

ABSTRACT

The growth of high speed computer networks and that of Internet, in particular, has explored means of new business, scientific, entertainment, and social opportunities. Ironically, the cause for the growth is also of the apprehension use of digital formatted data. Digital media offer several distinct advantages over analog media, such as high quality, easy editing, high fidelity copying. The ease by which digital information can be duplicated and distributed has led to the need for effective copyright protection tools. Various software products have been recently introduced in attempt to address these growing concerns. Digital Watermarking is the process that embeds data called a watermark into a multimedia object such that watermark can be detected or extracted later to make an assertion about the object.

In this thesis, three different contributions were suggested, firstly, a Partial image Encryption algorithm based on Multi-Level two dimension Discrete Wavelet Transform and Multi-Map Orbit Hopping Chaotic Encryption (ML 2D-DWT-MMOH-CPE) has been proposed, secondly, a new commutative watermarking and partial encryption (CWPE) algorithm based on DWT Spread Spectrum watermarking and Partial Encryption algorithm using single level two Dimension Discrete Wavelet Transform and Multi-Map Orbit Hopping Chaotic Encryption (1L 2D-DWT-MMOH-CPE) and, finally, a new Commutative Watermarking and Partial Encryption algorithm based on one level two dimension wavelet and discrete cosine transform domain (1L 2D-DWT-DCT) and Multi-Map Orbit Hopping Chaotic Encryption (MMOH-CPE).

DWT characteristics provide spatial\frequency localization and multi resolution sub-band. CDMA SS improves security, anti interference and low probability of intercept. Chaos based encryption techniques which is considered suitable for practical use as these techniques provide combination of speed, high security, complexity, reasonable computational overheads and computational power.

For the proposed algorithm (CWPE) (1L 2D-DWT-MMOH-CPE), performance evaluation reflects some weakness against some sever attacks (50% Resizing, Median Filtering, 10% JPEG Compression). To overcome the previous mentioned weakness, a Commutative Hybrid Frequency Domain Watermarking and Chaotic Partial Encryption algorithm is proposed (CWPE) (1L 2D-DWT-DCT-MMOH-CPE), which is based on the fact ; combined two transforms could compensate for the drawbacks of each other; resulting in effective watermarking, based on characteristics of embedding locations.