



RESEARCH ARTICLE

Hybrid Compression Using DWT-DCT and Huffman Encoding Techniques for Biomedical Image and Video Applications

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Abstract— *Digital image and video in their raw form require an enormous amount of storage capacity. Considering the important role played by digital imaging and video, it is necessary to develop a system that produces high degree of compression while preserving critical image/video information. There is various transformation techniques used for data compression. Discrete Cosine Transform (DCT) and Discrete Wavelet Transform (DWT) are the most commonly used transformation. DCT has high energy compaction property and requires less computational resources. On the other hand, DWT is multi resolution transformation. In this work, we propose a hybrid DWT-DCT, Huffman algorithm for image and video compression and reconstruction taking benefit from the advantages of both algorithms. The algorithm performs the Discrete Cosine Transform (DCT) on the Discrete Wavelet Transform (DWT) coefficients. Simulations have been conducted on several natural, benchmarks, medical and endoscopic images. Several high definition and endoscopic videos have also been used to demonstrate the advantage of the proposed scheme. Huffman coding is used to encode the compressed bit streams at compression stage. In reconstruction stage, it is used to decode the received encoded bit streams. It also increases the compression ratio.*

Key Terms: - *Biomedical images and videos; Compression ratio (CR); DCT; DWT; Huffman coding; PSNR; SSIM*

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