

ABSTRACT

In this final project will be designed and implemented a system for digital image compression using Reversible Wavelet Transform (RWT) and Arithmetic Coding. Generally, compression process can be described as follow: image test decomposed using reversible wavelet transform using two filters S-Transform and TS-Transform. Then wavelet coefficients of wavelets subband transformed into vectors. Then, vector quantization applied on purpose to search for the most appropriate representation values. Entropy encoding processed using arithmetic coding and Huffman coding is used as another entropy coding comparator.

After the design and implementation, applied testing of system compression then observed the quality of compression system based on compression value and PSNR. In quantization process applied four types of codebooks which are codebook 256-32-8, 256-64-64, 1024-64-64, and 2048-128-128.

From the results of subjective and objective measurements, system compression using reversible wavelet transform (RWT) dan arithmetic coding have PSNR value affected by wavelet transform and size of codebook. The greater the codebook size will result better quality of image compression. Codebook size of 256-32-8 and 256-64-64 resulting PSNR value ≤ 30 dB. Therefore, Codebook size of 1024-64-64, and 2048-128-128 resulting PSNR ≥ 30 dB. The differences between histogram of light intensity not affected the quality of compressed image. From subjective measurements using MOS proven that this system compression has a high level imperceptibility.

Keywords: *Reversible Wavelet Transform, Arithmetic Coding, vector quantization, PSNR*