A COMPARATIVE STUDY BETWEEN TWO HYBRID MEDICAL IMAGE COMPRESSION METHODS

UNDERGRADUATE THESIS

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BAKRIE UNIVERSITY

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Submitted as one of requirements to obtain bachelor degree (S1)

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STATEMENT OF ORIGINALITY

The material in this Undergraduate Thesis is the result of my own work, and all sources are quoted and cited properly.

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STATEMENT OF APPROVAL

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Finally, I truly hope that this Undergraduate Thesis can be used as reference in the future, especially for those who have interest in medical image compression.

Jakarta, August 8th 2014

Clarissa Philana Shopia Azaria

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A Comparative Study between Two Hybrid Medical Image Compression Methods

Clarissa Philana Shopia Azaria[1]

ABSTRACT

In the medical community, it is still discussion whether to apply lossy or lossless compression methods since each has its own advantages and weaknesses. Then the idea of combining both methods arises to achieve higher compression rate for transmission and storage efficiency without discarding important medical information. This combination is called hybrid method. This research aimed to compare two hybrid medical image compression methods by applying them into the same data set. The hybrid medical image compression methods were vector quantization with variable block sizes in wavelet domain (VQ-wavelet) and DCT-based subband decomposition and modified SPIHT data organization (DCT-SPIHT). Seven metrics were used to objectively evaluate the compressed images; entropy, computation time, mean square error (MSE), peak signal to noise ratio (PSNR), structural similarity (MSSIM), normalized cross correlation (NCC), and image quality index. Simulation results showed that DCT-SPIHT is the best method which is supported by fast computation time, lower MSE, higher PSNR, and almost perfect value of MSSIM, NCC, and image quality index.

***Index terms*: hybrid medical image compression method, discrete cosine transform (DCT), set partitioning in hierarchical trees (SPIHT), vector quantization (VQ), wavelet transform**

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