GA-Based Discrete Hartley Transform Quantization Table Design for Medical Image Compression

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ABSTRACT

Recently, medical images are widely used in disease of diagnosis. The technique of X-ray, Magnetic Resonance Images（MRI）and Computed Tomography（CT）are used widely in medical image. Because the bandwidth of network is restricted, the store and compression techniques for medical image become more and more important. In this paper, we present a scheme to get better 2-D Discrete Hartley Transform（DHT）quantization table by Genetic Algorithm（GA）for medical image compression. The image is divided into 8×8 non-overlapping sub-blocks. Each sub-block transform to the frequency domain by DHT. All the sub-blocks are categorized into four different classes according to the activity of each sub-block in frequency domain. Each class has similar activity in order to improve the DC coefficients encoded. The scanned coefficients are encoded using Huffman coding scheme. The performance was compared with R. Shyam Sunder’s quantization table, the proposed method has been average decreased Mean-Square-Error（MSE）around 1 and average raised peak-signal-to-noise-ratio（PSNR）around 3 dB in the same compression ratio on the Magnetic Resonance Images. Key Word：Hartley Transform, Genetic Algorithm, Medical image compression

Keywords : Word：Hartley Transform, Genetic Algorithm, Medical image compression ; Genetic Algorithm ; Hartley Transform

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