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THE TRADE-OFF BETWEEN ROBUSTNESS AND IMPERCEPTIBILITY PERFORMANCE OF WATERMARKING TECHNIQUE WITH DWT AND SCHUR DECOMPOSITION FOR MEDICAL IMAGES

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Abstract

Developing a watermarking algorithm for a medical image is required to conserve the original visual quality and resistance ability to image attacks. The problem is that there is opposite relation between imperceptibility and robustness performance. This paper proposed a watermarking algorithm that applied discrete wavelet transfer (DWT) and Schur Decomposition to produce a watermarked image with high imperceptibility and robustness performance. In the embedding process, the DWT and Schur decomposition is used to decompose the domain of a host medical image, and the modification to hide the watermark bit is evaluated and controlled to keep the imperceptibility performance high as possible for the watermarked image. The imperceptibility,

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embedding capacity, and robustness are evaluated for Magnetic Resonance (MR), Computed Tomography (CT), and Positron Emission Tomography (PET) medical image modalities. The results obtained from the experiment and showed that the proposed watermark technique has high performance in three measurement terms imperceptibility, embedding capacity, and robustness. The average peak signal-to-noise ratio (PSNR) of the different six watermarked images was 73.65dB. Also have high robustness against JPEG compression, salt and pepper noise, Gaussian noise, and rotation attack. © 2021 Little Lion Scientific

Author keywords

Discrete Wavelet Transfer; Imperceptibility; Medical Image; Robustness; Schur Decomposition; Watermarking Technique

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