

Robust Medical Image Watermarking based on Contourlet and Extraction Using ICA

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Abstract : In this paper, a medical image watermarking algorithm based on contourlet is proposed. Medical image watermarking is a special subcategory of image watermarking in the sense that images have special requirements. Watermarked medical images should not differ perceptually from their original counterparts because clinical reading of images must not be affected. Watermarking techniques based on wavelet transform are reported in many literatures but robustness and security using contourlet are better when compared to wavelet transform. The main challenge in exploring geometry in images comes from the discrete nature of the data. In this paper, original image is decomposed to two level using contourlet and the watermark is embedded in the resultant sub-bands. Sub-band selection is based on the value of Peak Signal to Noise Ratio (PSNR) that is calculated between watermarked and original image. To extract the watermark, Kernel ICA is used and it has a novel characteristic is that it does not require the transformation process to extract the watermark. Simulation results show that proposed scheme is robust against attacks such as Salt and Pepper noise, Median filtering and rotation. The performance measures like PSNR and Similarity measure are evaluated and compared with Discrete Wavelet Transform (DWT) to prove the robustness of the scheme. Simulations are carried out using Matlab Software.

Keywords : digital watermarking, independent component analysis, wavelet transform, contourlet

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