Medical Image Watermark and Tamper Detection Using Constant Correlation Spread Spectrum Watermarking

Authors : Peter U. Eze, P. Udaya, Robin J. Evans

Abstract : Data hiding can be achieved by Steganography or invisible digital watermarking. For digital watermarking, both accurate retrieval of the embedded watermark and the integrity of the cover image are important. Medical image security in Teleradiology is one of the applications where the embedded patient record needs to be extracted with accuracy as well as the medical image integrity verified. In this research paper, the Constant Correlation Spread Spectrum digital watermarking for medical image tamper detection and accurate embedded watermark retrieval is introduced. In the proposed method, a watermark bit from a patient record is spread in a medical image sub-block such that the correlation of all watermarked sub-blocks with a spreading code, W, would have a constant value, *p.* The constant correlation *p*, spreading code, W and the size of the sub-blocks constitute the secret key. Tamper detection is achieved by flagging any sub-block whose correlation value deviates by more than a small value, ⬚, from *p*. The major features of our new scheme include: (1) Improving watermark detection accuracy for high-pixel depth medical images by reducing the Bit Error Rate (BER) to Zero and (2) block-level tamper detection in a single computational process with simultaneous watermark detection, thereby increasing utility with the same computational cost.

Keywords : Constant Correlation, Medical Image, Spread Spectrum, Tamper Detection, Watermarking

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