Perceptual Based Data Hiding in Medical Image by Patient Information

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ABSTRACT

Recently, the medical image has been digitized by the development of computer science. The copyright and authentication protection of the medical image is more and more important in medical data transmitting between hospitals. In this paper, we propose a perceptual model based digital watermarking technique for embedding patient information in a medical image. First, we use Perceptual Quality Measure(PQM) method classified a medical image into significant and insignificant regions by controlling the threshold, and embedding patient information in insignificant regions to arise the peak signal to noise ratio(PSNR).Then using a blind image watermarking method in discrete cosine transform(DCT) domain to achieve high quality and robustness of the watermarked images. The experimental results show the watermarked images can extract the watermark clearly by illegal forgery and image processing such as brightness/contrast enhancement, sharpen filtering, adding noise and JPEG lossy compression.

Keywords : medical image, Perceptual Quality Measure(PQM), digital watermarking, discrete cosine transform(DCT), blind image watermarking

Table of Contents

REFERENCES

[1] http://www.pccgroyp.com/,Jul.2005.

[2] http://www.dicomanalyser.co.uk/,Jul.2005.

[3] H. Berghel, "Watermarking Cyberspace", Communications of the ACM, Vol. 40, No. 11, pp19-24, November 1997.

[4] I. Cox, J. Kilian, T. Leighton, and T. Shamoon, "Secure Spread Specturm watermarking for Multimedia," IEEE Trans. on Image Processing,Vol.6,No.12, pp. 1673-1687, Dec. 1997.

[5] C. Podilchuk and W.Zeng, " Image Adaptive Watermarking Using Visual Models," IEEE Journal on Selected Areas in Communication,Vol.16,No.4.pp.525-539,1998.

[6] M.L.Miller and J.A Bloom, "Computing the Probability of False Watermark Detection, " Proceeding of the Third International Workshop on Information Hiding, pp.146-158, 1999.

[7] Joseph J. K. Ruanaidh, and Trierry Pun, "Rotation, Scale and Translation Invariant Digital Image Watermarking," IEEE ICIP, pp 536-539, Santa Barbara, 1997.

[8] F. Y. Shih and Y. Wu, "Robust watermarking and compression for medical images based on genetic algorithms,'' Information Sciences, In Press,2005.

[9] C. T. Hsu and J. L. Wu, "Hidden digital watermarks in images, "IEEE Transactions on Image Proccessing, Vol.8, pp.58-68, Jan.1999.

[10] N. B. Puhan and A. Makur,"A robust image watermarking scheme based on perceptual contrast energy" ,ICISIP 2004, pp 114- 118, January 2004.

[11] JL Mannos and DJ Sakrison. The effects of a visual fidelity criterion on the encoding of images . IEEE Transactions on Information Theory, Vol. IT-20, No. 4, pp. 525--536, 1974