

GPU Based High Speed Error Protection for Watermarked Medical Image Transmission

Authors : Md Shohidul Islam, Jongmyon Kim, Ui-pil Chong

Abstract : Medical image is an integral part of e-health care and e-diagnosis system. Medical image watermarking is widely used to protect patients' information from malicious alteration and manipulation. The watermarked medical images are transmitted over the internet among patients, primary and referred physicians. The images are highly prone to corruption in the wireless transmission medium due to various noises, deflection, and refractions. Distortion in the received images leads to faulty watermark detection and inappropriate disease diagnosis. To address the issue, this paper utilizes error correction code (ECC) with (8, 4) Hamming code in an existing watermarking system. In addition, we implement the high complex ECC on a graphics processing units (GPU) to accelerate and support real-time requirement. Experimental results show that GPU achieves considerable speedup over the sequential CPU implementation, while maintaining 100% ECC efficiency.

Keywords : medical image watermarking, e-health system, error correction, Hamming code, GPU

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