Abstract

The current development of multimedia technology and internet enable people to exchange information of digital data. All digital data that are spread all over the internet are easily accessible for many people, but their copyrights are difficult to be determined. Everyone could possibly duplicate and alter the copyrights of the data.

*Digital watermarking is one of many solutions to solve this problem. Watermarking is a technique which is used for concealing the information in any digital data (image, audio, or video), but its existence cannot be determine easily by unauthorized persons. Digital image will be converted to frequency domain using discrete wavelet transform (*DWT*) to obtain an approximation subband (LL) and three detail subbands (HL, HH, and LH). In the selected subband, the watermark bit is embedded using M-ary modulation with* CDMA *spread spectrum scheme.* CDMA *is a technique for transmitting information from multiple users in the same bandwidth. Spread Spectrum is a scheme to spread the watermark bits on the entire surface of the image.*

The experimental results show that this technique yields a good imperceptibility with PSNR= *±40 db and* SSIM ≥ *0.94, as well as robust againsts several attacks, such as :* JPEG *Compression, image cropping, additive white gaussian noise, salt & pepper noise, histogram equalization, and sharpening with* BER ≤*10%.*

***Keywords : Watermarking, Discrete Wavelet Transform, M-ary modulation, Spread Spectrum,* CDMA.**