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Abstract
With the rapid development of Internet, intrusions of copyrights are getting more and more serious. Digital products such as pictures, MP3 music or VCD are spread, copied or modified without the author's permission, which results in the so-called "Intrusion of Intellectual Property Rights (IPR)." Some scholars proposed solutions such as digital watermark, digital fingerprints, or digital signatures to the problem. With the insertion of the author's digital portrait, fingerprint, trademark, or picture into the priced media, these inserted data become the basis of copyright certification. From then on, digital watermark is widely used.

In this thesis, we proposed a new digital watermarking technique based on discrete wavelet transformation. The proper wavelet band for inserting the watermark was found by analyzing the attacks of JPEG compression, blurring, sharpening, and histogram equalization on the original picture. Then we insert the watermark followed the binary difference relation matrix (BDRM) which was derived by analyzing the wavelet coefficients' variation of the original and histogram equalized pictures. The BDRM doesn't only have less data for replacing the original picture but also promote the accuracy of watermark extracting. Besides, in order to ensure that the watermark can resist the attack of cutting, we adopt the technique of toral automorphisms, dislocating watermarks randomly and inserting them to the middle frequency portion of original picture.

Experiment results show that the proposed technique of watermarks is able to resist attacks such as JPEG compression, blurring, sharpening, sharpening as well as blurring, and cutting.
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