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论文

基于提升小波的多重数字音频水印

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摘要
该文提出了一种在提升小波域同时嵌入鲁棒水印和易损水印的音频水印算法。原始音频信号经过提升小波变换后，将低频小波系数进行均值量化嵌入鲁棒水印，具有较好的鲁棒性和不可感知性；对高频小波系数直接进行单个系数量化嵌入易损水印，当音频内容发生篡改时，这些水印信息会发生相应的改变，从而可以鉴定原始音频的完整性。水印的提取不需要原始音频信号。实验结果表明，鲁棒水印对MP3压缩、低通滤波、加噪、重量化、重采样等信号处理攻击具有很强的鲁棒性；而易损水印对上述攻击则具有很强的敏感性。

关键词 多重音频水印 提升小波变换 盲检 鲁棒水印 易损水印

分类号 TP391

Multiple Audio Watermarks Based on Lifting Wavelet Transform

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Abstract
An audio watermarking scheme which embedded robust and fragile watermark at the same time in lifting wavelet domain is presented. Robust watermark is embedded in the low frequency range using mean quantization. It has great robustness and imperceptibility. Fragile watermark is embedded in the high frequency range by quantizating single coefficient, when the audio signal is tampered, the watermark information will change synchronously. So it can be used for audio content integrity verification. The watermark can be extracted without the original digital audio signal. Experimental results show that robust watermark is robust to many attacks, such as MP3 compression, low pass filtering, noise addition, requantization, resampling and so on. Fragile watermark is very sensitive to these attacks.

Key words Multiple audio watermarks Lifting wavelet transform Blind detection Robust watermark Fragile watermark

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