Abstract

In this paper, a new phase coding method is used to embed any watermark data type (text, image, audio) in audio signals. The basic idea is to segment the audio signal and transforming it using the Discrete Fourier Transformation (DFT) and then embedding the watermark in the initial phase coefficients for every four segments. The used cover audio files of WAV type. The watermark can be extracted semi-blindly. Performance of the proposed watermarking methods was tested by using normalized correlation (NC) and bit error rates (BER) to measure the robustness, and signal to noise ratio (SNR) to evaluate the imperceptibility of our proposed methods. Experimental results shows superiority of the proposed scheme in term of robustness, inaudibility and capacity compared within the traditional phase coding method, the best audio test sample shows that the SNR value was above (20 dB) for (250 byte) watermark capacity with high robustness against cropping attack and showed modest robustness against some type of attacks.

References


**Index Terms**

Computer Science  
Security

**Keywords**
Audio watermarking; Phase coding; DFT; Semi-blind detection; Robustness; inaudibility.