Bi-orthogonal Wavelet based Adaptive Image Watermarking using Human Visual System and Fuzzy Inference System

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Abstract

Digital age today has shown increasing reliance on digital media and rapid distribution of digital contents. The issues of piracy and copyright are of immense concern in this exponentially increasing digital revolution. In this paper, authors propose use of bi-orthogonal wavelet transform as an effective tool to address copyright infringement issues. A synergistic combination of bi-orthogonal wavelet transform, human visual system characteristics and fuzzy inference system is arrived at to develop a novel adaptive image watermarking scheme. Logo watermark is used to prove ownership of digital property. A hierarchical data structure is generated using bi-orthogonal wavelet decomposition to represent an image. The reconstruction of image is achieved by computing inverse wavelet transform of modified wavelet coefficients. The unique feature of the proposed scheme is that fuzzy inference system is used to effectively establish relation between different HVS characteristics and adaptively adjusting embedding strength of watermark.

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Index Terms

Computer Science

Security
Keywords

Bi-orthogonal Wavelet Transform  Human Visual System (HVS)  Fuzzy Inference System (FIS)