A Perceptual Data Hiding Technique for Color Image Protections

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ABSTRACT

Data hiding is the technique of embedding information (such as a watermark) into a carrier signal (video, image, audio, text) such that the information can be detected and extracted later for steganography applications such as covert communication, and watermarking applications such as copyright protection, content authentication, signature verification, content identification, fingerprinting, media forensics, copy control, and broadcast monitoring [PeAK99], [MoKo05], [WuLi03]. The important technical issues for the data hiding techniques are transparency, robustness, capacity, security, and detectability [MaDD04], [MoKo05]. These issues are also requirements for data hiding systems. These requirements can vary under different applications. Consequently, this data hiding technique should be adaptive to the environment. A more advanced approach should involve perception, cognition, and learning [Kins12], [Hayk12], [WaZK10]. This paper focuses on data hiding techniques for watermarking applications. The data hiding techniques for watermarking applications are called watermarking techniques.

In this paper, we present a new intelligent, robust and adaptive data hiding technique for color images based on the combination of discrete wavelet transform (DWT), human visual system (HVS) model and general regression neural network (GRNN). First, the RGB image is converted to YCrCb image, and then the luminance component Y is decomposed by DWT. Wavelet coefficients are then analyzed by a HVS model to select suitable coefficients for embedding the watermark. The watermark bits are embedded into the selected coefficients by training a GRNN. At the decoder, the trained GRNN is used to recover the watermark from the watermarked image. Experimental results show that the proposed approach is robust in achieving imperceptibility in watermarking [DaKi12].

REFERENCES