

A NOVEL WATERMARKING SCHEME FOR COPYRIGHT PROTECTION BASED ON ADAPTIVE JOINT IMAGE FEATURE AND VISUAL SECRET SHARING

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ABSTRACT. *A visually verifiable watermarking scheme for the copyright protection of the digital image is proposed in this paper. In this scheme, the clustering function of the generalized brain-state-in-a-box neural network (gBSB) and the second-order moment of grayscale histogram are employed to extract a joint image feature, which is constructed by the luminance and the texture characteristics of the protected image, and the image feature can be adaptively adjusted by altering parameters such as the probability P and the threshold T . In addition, the visual cryptography technique is performed to generate the authentication information and realizes both the visual verification and the asymmetric public verification at the same time. The experimental results show that the proposed scheme is highly robust and resilient to some malicious signal processing attacks and geometric attacks. It can be totally applied to the copyright protection of the digital multimedia.*

Keywords: Copyright protection, Watermarking, Joint feature, Visual secret sharing, gBSB, Histogram statistical moment, IWT

1. Introduction. Since the digital media, which is widely spread over the networks and electronic devices, can be duplicated and modified arbitrarily without any permission, the owners are confronted with a high risk of piracy. In recent years, the copyright protection of the digital media has become the most popular issue in the field of the information security. As an effective technique, many kinds of watermarking schemes are proposed to provide solutions to verify the ownership of the digital media and show excellent performance [1-10].

Recently, a kind of non-embedding copyright-proving watermarking mechanism is proposed. The scheme constructs authentication information using a logo watermark image and the salient features extracted from the original image instead of embedding the watermark into the host image. And then the authentication information is transmitted to a public trusted authority (TA) for registration. TA is designed specifically to preserve the authentication information for the copyright protection. When some suspicious images need to be verified, the verifier can derive the feature information from the detected image and make use of the authentication information from TA to generate the logo-type watermark which stands for the ownership of copyright. Obviously, this kind of watermarking mechanism has four advantages which make up the deficiencies of the traditional watermarking scheme:

- 1) The copyright-protection scheme is lossless, i.e., the protected image is precisely the original one;