Abstract

Digital watermarking is widely used as one of the techniques to identify ownership and protect copyrights of digital images. The watermark inserted may be visible or invisible. A Visible watermark, which is nothing but a digital pattern logo or trademark, directly convey ownership information on the media, while invisible watermarks do it indirectly after being extracted with the help of extraction techniques. A visual watermark should be such that it is clearly visible in order to survive legal procedure, yet important details of host image should not be lost. Better visibility requires higher amount of modification to the host image leading to introduction of larger amount of error and reduced PSNR. Visible watermarking methods are devised to embed visible watermarks by automatically determining the required optimal strength of the watermark to be inserted. One important problem with visual watermarking is that attackers can remove the watermarks by utilizing specialized algorithms like inpainting and insert their own watermarks. In order to prevent removal attack, visible watermarks having highly textured patterns or widely varying colors should be inserted into highly textured image areas. Many of the visible watermarking algorithms fail to embed watermarks in images with higher texture content. This
paper proposes a reversible visible watermarking method that can deal with high texture content for the image area as well as the watermark. The watermark image with its range reduced by a factor of $\alpha$ is added to the host image, whose range is also reduced by a factor of $1-\alpha$. The $\alpha$ factor is automatically determined based on the entropy of the host as well as the watermark images. The copyright owner can easily recover the original host image with minimal error, provided information regarding the scaling factors, position of watermark and the watermark itself are preserved. Experimental results established the effectiveness of the method proposed.

References


**Index Terms**

Computer Science  
Image Processing

**Keywords**

Watermark, visible, entropy, range, recovered, PSNR.