Style Robust Invisible Watermarking

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Abstract

Digital watermarking (also known as data hiding or data embedding) is a rapidly developing research area with a potentially enormous number of practical applications such as copyright protection, image authentication, metadata tagging, image fingerprinting, security, and covert communication. It relates to techniques that are used to imperceptibly embed information in images, video, or audio, in such a way that it is resilient against intentional or unintentional attempts to remove it. After a brief overview of the history, applications, and basic approaches to digital watermarking, a novel robust watermarking method based on the convolution of message data with a random phase carrier is presented. The theory behind this method is reviewed and it is shown that the technique can be used to hide both pictorial and non-pictorial data. The procedures used for message extraction optimization, synchronization, and rotation and scale correction are discussed. The algorithm's benchmark results using the Stirmark test are presented and a live demo of the watermark extraction in a print/scan application is provided.

Author Biography

Majid Rabbani (Ph.D. UW-Madison, 1983) is a Kodak Distinguished Research Fellow and project manager of video processing at Eastman Kodak. He is the recipient of two engineering Emmy Awards (1990 and 1996), and the recipient of the 1988 C.E.K. Mees Award (Kodak's highest research honor) in recognition of his research for noise characterization in imaging systems. He is the co-author of the book Digital Image Compression Techniques (SPIE Press, 1991, and the Editor of the SPIE Milestone Series on Image Coding and Compression (1992). He is the author of over 60 technical articles or book chapters and holds 31 issued patents (9 filed). He is a Fellow of IEEE, a Fellow of SPIE, and a Kodak Distinguished Inventor.