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Numerical Mathematics Frameworks for Tackling Watermarking Problems

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Abstract

Watermarking is a well known and widely used method in information security. According to this approach identifiers of copyright owners or sources of messages are incorporated within the messages themselves in order to trace and recognize the source or the copyright owners. Watermarking techniques have been widely applied including, among others, cases of copyright protection of digital products, such that images, videos, music, films distributed on the internet. In addition, intellectual property protection issues due to multimedia piracy made the use of watermarking mandatory. Numerical mathematics frameworks for tackling watermarking issues are studied and analyzed. Furthermore, results including, among others, for motion based watermarking are presented. In addition, properties for qualifications of watermarking techniques are proposed.

References

[1] G. Bleumer, Watermarking, In: *Encyclopedia of Cryptography and Security*, H.C.A. van Tilborg (ed), Springer, Boston, MA, 655-656, (2011).

[2] G. Hachez and J. -J. Quisquater, Which directions for asymmetric watermarking?, in Proc. 11th European Signal Processing Conference, Toulouse, France, 1-4, IEEE, (2002).

[3] S. Katzenbeisser and F. Petitcolas, *Information Hiding Techniques for Steganography and Digital Watermarking*, Norwood, MA, USA:Artech House, (2000).

[4] N. Papadakis, K. Raftopoulos and S. Kyriazakos, Motion Based Watermarking for MPEG Streams over 3G Mobile Radio Networks, (2009).