Abstract

Most watermarking algorithms are either robust watermarking for copyright protection or fragile watermarking for tamper detection. This paper proposes a fragile video watermarking algorithm that has the ability to detect tamper in spatial domains. The original video frame is converted from RGB color space into YCbCr color space, then the chrominance component Cb is partitioned into non-overlapping blocks of pixels according to the number of bits of the original watermark. The watermark bits are embedded using a mathematical rule for each block separately. A detailed study for the applicability of this algorithm to content authentication is conducted. Experimental results reveal that the proposed algorithm achieves a low computation cost and high detection rate against a wide range of tampering attacks such as Filtering, Non-Geometric Transformation and Geometric Transformation.

References

- Cox, I. J., Miller, M. L., and Bloom, J. A., "Digital watermarking and
- Wu, M., and Liu, B. D., "Data hiding in image and video: Part I-fundamental
  issues and solutions"; IEEE Trans. Image Processing, Vol. 12, No. 6, PP: 685-695,
  2003.
- Yassin, N. I., Salem, N. M., and El Adawy, M. I., "Block based video
  watermarking scheme using wavelet transform and principle component analysis"; IJCSI
- Sinha, S., Bardhan, P., Pramanick, S., Jagatramka, A., Kole, D. K., and Chakraborty,
  A., "Digital video watermarking using discrete wavelet transform and principal component
  analysis"; International Journal of Wisdom Based Computing, Vol. 1, No. 2, PP: 7-12,
  2011.
- Jayamalar, T., and Radha, V., "Survey on digital video watermarking techniques
  and attacks on watermarks"; International Journal of Engineering Science and
- Kalker, T., Depovere, G., Haitsma, J., and Maes, M., "A video watermarking
  system for broadcast monitoring"; Proceedings of The SPIE, Vol. 3657, PP: 103-112,
  1999.
- Paul, R. T., "Review of robust video watermarking techniques"; IJCA Special
  Issue on Computational Science - New Dimensions & Perspectives NCCSE, No. 3, PP: 90-95,
  2011.
- Cox, I. J., Kilian, J., Leighton, F. T., and Shamoon, T., "Secure spread spectrum
  watermarking for multimedia"; IEEE Trans. Image Processing, Vol. 6, No. 12, PP:
- Li, C. H., and Wang, S. S., "Transform based watermarking for digital images and
- Sinha, S., Pramanick, S., Jagatramka, A., Bardhan, P., Kole, D. K., and Chakraborty,
  A., "Digital video watermarking using singular value decomposition"; Proceedings
- Do, err, G., and Dugelay, J. L., "A guide tour of video watermarking"; Signal
- Wong, P. W., and Memon, N., "Secret and public key image watermarking
  schemes for image authentication and ownership verification"; IEEE Trans. Image
- Yang, H., and Kot, A. C., "Binary image authentication with tampering localization
  with pixel-level tamper localization"; in Proc. Int. Conf. Image Processing, PP:
- Liu, S. H., Yao, H. X., Gao, W., and Liu, Y. L., "An image fragile watermark
  scheme based on chaotic image pattern and pixel-pairs"; Applied Mathematics and
A Fragile Video Watermarking Algorithm for Content Authentication based on Block Mean and Modulation Factor


Index Terms

Computer Science  
Security

Keywords

Content Authentication  
Fragile Video Watermarking  
Tampering Attacks  
Modulation Factor.