

{tag} [IJCA](#)

{/tag}

RTIPPR

© 2010 by IJCA

Journal

Number 2 - Article 3

Year of Publication: 2010

Authors:

Ajit Danti

Preethi Acharya

{bibtex}spe105t.bib{/bibtex}

Abstract

Main goal of steganography is to communicate securely in a completely undetectable manner. It is an art of hiding secret data in an innocently looking dummy container. In the Steganographic process, communication is masked to make the hidden message not discernible to the observer. Hidden message may be textual or image. In this paper, a novel image steganography method based on randomized bit embedding is presented. Firstly the Discrete Cosine Transform (DCT) of the cover image is obtained. Then the stego image is constructed by hiding the given secret message image in Least Significant Bit of the cover

image in random locations based on threshold. DCT coefficients determine the randomized pixel locations for hiding to resist blind steganalysis methods such as self calibration process by cropping some pixels to estimate the cover image features. Blind steganalysis schemes can be guessed easily hence the proposed technique is more practically applicable. Quality of the stego image is analyzed by tradeoff between no of bits used for embedding. Efficacy of the proposed method is illustrated by exhaustive experimental results and comparisons.

Reference

- Avcibas, I., Sankur, B., Memon, N.: Image steganalysis with binary similarity measures. In: Proc. ICIP, pp. 645–648 (2002)
- C. Kurak and J. McHugh, a cautionary note on image downgrading, in: Proceedings of the IEEE 8th Annual Computer Security Applications Conference, 30 Nov-4 Dec, 1992, pp. 153-159.
- Dabeer, O., Sullivan, K., Madhow, U., Chandrasekaran, S., Manjunath, B.: Detection of hiding in the least significant bit. IEEE Transactions on Signal Processing, Supplement on Secure Media I 52, 3046–3058 (2004)
- Fridrich, J., Goljan, M., Lisoněk, P., Soukal, D.: Writing on wet paper. In: ACM Workshop on Multimedia and security, Magdeburg, Germany (2004)
- Harmsen, J.J., Pearlman, W.A.: Steganalysis of additive noise modelable information hiding. In: Proc. of SPIE, pp. 131–142 (2003)
- Hetzl, S., Mutzel, P.: A graph theoretic approach to steganography. In: 9th IFIP TC-6 TC-11 International Conference, Communications and Multimedia Security, Salzburg, Austria, vol. 3677, pp. 119–128 (2005)
- Lyu, S., Farid, H.: Detecting hidden messages using higher-order statistics and support vector machines. In: Ershov, A.P., Nepomniaschy, V.A. (eds.) International Symposium on Theoretical Programming. LNCS, vol. 5, Springer, Heidelberg (1974)
- Pevny, T., Fridrich, J.: Multi-class blind steganalysis for JPEG images. In: Proc. of SPIE, San Jose, CA (2006)
- Pevny, T., Fridrich, J.: Merging Markov and DCT features for multi-class JPEG steganalysis. In: Proc. of SPIE, San Jose, CA (2007)
- Provos, N.: Defending against statistical steganalysis. In: 10th USENIX Security Symposium, Washington DC, USA (2001) of the IEEE 22nd Annual EMBS International Conference, July 23-28, 2000, Chicago, USA, pp. 280-283.
- S. Miaou, C. Hsu, Y. Tsai and H. Chao, A secure data hiding technique with heterogeneous data-combining capability for electronic patient records, in: Proceedin
- Sallee, P.: Model-based steganography. In: Kalker, T., Cox, I., Ro, Y.M. (eds.) IWDW 2003. LNCS, vol. 2939, pp. 154–167. Springer, Heidelberg (2004)
- Shi, Y.Q., Chen, C., Chen, W.: A Markov process based approach to effective attacking JPEG steganography. In: Leilich, H.-O. (ed.) GI-NTG Fachtagung Struktur und Betrieb von Rechensystemen. LNCS, Springer, Heidelberg (1974)
- Solanki, K., Sullivan, K., Madhow, U., Manjunath, B.S., Chandrasekaran, S.: Statistical restoration for robust and secure steganography. In: Proc. ICIP, Genova, Italy, pp. II 1118–1121

(2005)

- Solanki, K., Sullivan, K., Madhow, U., Manjunath, B.S., Chandrasekaran, S.: Probably secure steganography: Achieving zero K-L divergence using statistical restoration. In: Proc. ICIP, Atlanta, GA, USA, pp. 125–128 (2006)
- U. C. Nirinjan and D. Anand, Watermarking medical images with patient information, in: Proceeding of the 20th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Hong Kong, China, 29 Oct-1 Nov, 1998, pp. 703-706.
- Wang, Y., Moulin, P.: Steganalysis of block-DCT image steganography. In: IEEE workshop on Statistical Signal Processing, IEEE Computer Society Press, Los Alamitos (2003)
- Westfeld, A.: High capacity despite better steganalysis (F5 - a steganographic algorithm). In: Moskowitz, I.S. (ed.) Information Hiding. LNCS, vol. 2137, pp. 289–302. pringer, Heidelberg (2001)
- Y. Li, C. Li and Wei, Protection of mammograms using blind steganography and watermarking, in: Proceeding of the IEEE International Symposium on Information Assurance and security , 2007, pp. 496-499.
- Zollner, H. Federrah, H. Klimant, A. Pfitzner, R. Piotraschke, A. Westfeld, G. Wicke, and G. Wolf. Modelling the security of steganographic systems, 2nd Information Hiding Workshop, pp.345-355, april 1998.

Index Terms

Computer Science

Pattern Recognition

Key words

(Discrete Cosine Transform)

Steganography

DCT

Image hiding

Randomization