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PSW statistical LSB image steganalysis (Article)

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Abstract

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Steganography is the art and science of producing covert communications by concealing secret messages in apparently innocent media, while steganalysis is the art and science of detecting the existence of these. This manuscript proposes a novel blind statistical steganalysis technique to detect Least Significant Bit (LSB) flipping image steganography. It shows that the technique has a number of major advantages. First, a novel method of pixel color correlativity analysis in Pixel Similarity Weight (PSW). Second, filtering out image pixels according to their statistically detected suspiciousness, thereby excluding neutral pixels from the steganalysis process. Third, ranking suspicious pixels according to their statistically detected suspiciousness and determining the influence of such pixels based on the level of detected anomalies. Fourth, the capability to classify and analyze pixels in three pixel classes of flat, smooth and edgy, thereby enhancing the sensitivity of the steganalysis. Fifth, achieving an extremely high efficiency level of 98.049% in detecting 0.25bpp stego images with only a single dimension analysis. © 2016, Springer Science+Business Media New York.

Author keywords

Blind steganalysis Color correlativity Flipping steganography Image steganalysis LSB Machine learning Pixel similarity Statistical steganalysis Support vector machine

Indexed keywords

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-

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An introduction to image steganography techniques. Proceedings - 2012 International Conference on Advanced Computer Science Applications and Technologies (2012) ACSAT
-

- 3 Amin, M.M., Salleh, M., Ibrahim, S., Kitmin, M.R., Shamsuddin, M.Z.I.
Information hiding using steganography. in: 4th Natl. Conf (2003) on Telecommunication Technology Proceedings Shah Alam, Malaysia
-

- 4 Avcibas, I., Memon, N., Sankur, B.
Image steganalysis with binary similarity measures
(2002) IEEE International Conference on Image Processing, 3, pp. III/645-III/648. Cited 49 times.
-

- 5 Benton, R.
Chu H (2005) Soft computing approach to steganalysis of LSB embedding in digital images (2005) 3rd Int. Conf. on Information Technology Research and Education, 105–109, pp. 27-30.
-

- 6 Celik, M.U., Sharma, G.
Tekalp AM (2004) Universal image steganalysis using rate-distortion curves (2004) Proc. IST/SPIE 16th Annu. Symp. Electronic Imaging Science Technology, San Jose, CA, pp. 19-22. Cited 3 times.
-

- 7 Chaeikar, S.S., Razak, S.A., Zeidanloo, H.R., Zamani, M., Jaryani, F.
Interpretative key management (IKM), A novel framework. 2nd International Conference on Computer Research and Development (2010) ICCRD
-

- 8 Chandramouli, R., Kharrazi, M., Memon, N.
Image steganography and steganalysis: Concepts and practice
(2004) Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), 2939, pp. 35-49. Cited 81 times.

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-

- 9 Chen, X.-D.
Detect LSB steganography with bit plane randomness tests (2006) Proc. of 6th World Congress on Intelligent Control and Automation, China, June, 21-23, p. 2006.
-