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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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Engineering uncontrolled terms: Blind steganalysis Correlativity analysis Covert communications Image steganalysis Image steganography Least significant bits Pixel similarities Statistical steganalysis

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