

ORIGINAL ARTICLE

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Application of Adobe® Photoshop® CC 2018 for identifying color laser printer source of Xerox® brand



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Abstract

Background: In a field of digital forensic science, we have struggled to prove and keep any evidence in its most original form. The seized source of color laser printers in forgery crimes has been still an awkward issue today in digital forensic labs for identification. Till now no any scientific method has reported at all over the world that could be applied to make a success in an investigation for identifying the source of color laser printers with accuracy ratio 100%.

Method: We have explored an advanced security feature that has embedded in the color laser printouts of Xerox® brand. Adobe® Photoshop® CC 2018 has used as an indirect and nondestructive tool for our work.

Results: In this study, we could detect the hidden information (steganalysis) embedded in the color laser printouts of Xerox® brand candidate. Therefore, we could extract the clear precise machine identification code pattern corresponding to each color laser printer of Xerox® brand selected.

Conclusion: Via Adobe® Photoshop® CC 2018, we could successfully track all active security features characteristic of the color laser printers of Xerox® brand. Moreover, we could detect the identity and uniqueness of each color laser printer which had studied with an accuracy ratio reached to a hundred percent.

Keywords: Digital forensic science, Color laser printer steganography, Embedded security features, Adobe Photoshop

Main text

Since 1990, the Japan Business Machine Makers Association (JBMA) adopted a Counterfeit Protection System to decrease the counterfeiting and positively identify color laser copiers used illegally (MAFS Workshop, 2000) (Tweedy, 2001). In 2010, with a concordance between the US Secret Service and Freedom of Information Act (FOIA) and printer manufacturers (Canon, Brother, Casio, Hewlett-Packard, Konica, Minolta, Ricoh, Sharp and Xerox) agreed for commitments for identification counterfeiting crimes had committed via color laser machines. Therefore, the determination of color laser printers source seized in forgery crimes became one of the most challenges in digital forensic labs today.

In the last decade, digital forensic labs have introduced excess approaches to try catching a source of a defendant color laser printer such as, halftone analysis (Kim & Lee, 2014), statistical analysis of discrete wavelet transform (J. Choi et al., 2009) and noisy features analysis (J. H. Choi, Lee, & Lee, 2013), etc. have used. Notwithstanding, the previous methods could give good evidence but didn't reach to hundred percent in their detections. So, we have explored a new methodology for identifying the color laser printer source in a good attend enabling us to achieve an accuracy ratio hundred percent in our investigations. In our work, we have followed an active strategy for the identification. The active strategy has presented as a form of steganography for securing color laser printouts (Mace, 2010). The printer steganography consisted of embedded small microdots in their sizes, appeared in yellow color for a naked eye by zooming in with 36 X and

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Adobe Photoshopr Panel Developers Guide

David B. Mattingly



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