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Second-Order Statistics Analysis to Cope With Contrast Enhancement Counter-Forensics

By: De Rosa, A (De Rosa, Alessia)¹; Fontani, M (Fontani, Marco)¹; Massat, M (Massat, Matteo)¹; Piva, A (Piva, Alessandro)¹; Barni, M (Barni, Mauro)¹
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Abstract

Image forensic analysis for the detection of contrast enhancement and other histogram-based processing, usually relies on the study of first-order statistics derived from image histogram. Methods based on such an approach, though, are easily circumvented by adopting some counter-forensic attacks. To overcome such a problem, we propose a novel forensic technique based on the study of second-order statistics derived from the co-occurrence matrix. The experiments we carried out demonstrate that the proposed approach is very effective even in the presence of counter-forensic attacks, while it retains the good performance of histogram-based methods when no attack is present.

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Author Keywords: Counter-forensic; forensic analysis; histogram-based processing; second-order statistics; statistical analysis

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