

Reversible data hiding using side-match predictions on steganographic images

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Abstract Information hiding is an important method to achieve multi-media security. Recently, many researchers have paid attention to the reversible data hiding scheme, which can completely recover original multi-media files after the embedded data are extracted. In this paper, a side-match approach is proposed to achieve more capacity in histogram-based reversible data hiding for grayscale images. The histogram is created by exploiting the difference in all the values between pixels and their predictive values. Experimental results show that our method is capable of providing a great embedding capacity without causing noticeable distortion. In one-level hiding, where it has the best capacity, our method conserves image qualities larger than 48 dB. Furthermore, in multilevel hiding, a rotation strategy is proposed to further improve image qualities. Experimental results show that our method performs better than other existing methods in multilevel hiding cases.

Keywords Information hiding · Reversible data hiding · Side match · Prediction · Histogram

1 Introduction

With the rapid development of network technologies and the coming of the digital era, the Internet has become indispensable for many people. Through the development of the Internet, many new businesses have been developed, such as e-commerce, e-learning, online games, video-on-demand, etc. Furthermore, many existing enterprises have expanded their traditional business activities to the Internet. Every day, thousands of multimedia data are transferred conveniently and efficiently over the Internet. Because digital multimedia data, such as audio, videos, images, texts, etc., have the attributes of easy copying, modification and distribution, the development of the Internet has increased the problems of multimedia security. A way to protect the authentication and ownership of multimedia data has become

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