Reversible Data Hiding Using Prediction-based Adaptive Embedding

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Abstract

In this paper, we propose a new algorithm in reversible data hiding with prediction-based scheme. Reversible data hiding can be implemented with two types, one is by modifying the histogram of images, named the histogram-based scheme, and the other is by changing the difference value between neighboring pixels, called the difference-expansion-based (DE-based) method. Considering the ease of implementation, we employ the histogram-based scheme as the base, integrated with the DE-based methods, which is famous for the abundance in embedding capacity, in our algorithm. For hiding the secret information, the differences between original and predicted images are produced firstly, and they are intentionally altered to make reversible data hiding possible. By utilizing the advantages from the two types of methods, by change of histograms of difference values, global and local characteristics of original images can be utilized for hiding more capacity with acceptable quality of output image. With our method, it performs better in embedding capacity, image quality, and side information than conventional algorithm in literature. It also has the potential for the integration to relating algorithms for practical applications.

Key Words: Reversible data hiding, Multi-level embedding, Prediction, Image quality, Capacity, Side information.

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