REVERSIBLE IMAGE WATERMARKING USING ADAPTIVE PREDICTION ERROR EXPANSION & PIXEL SELECTION

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ABSTRACT

Reversible image watermarking enables the embedding of copyright or useful information in a host image without any loss of information. Here we are proposing a novel technique to improve the embedding capacity i.e. reversible watermarking using an adaptive prediction error expansion & pixel selection. This work is an improvement in conventional PEE by adding two new techniques adaptive embedding & pixel selection. Instead of uniform embedding we adaptively embed one or two bits into the expandable pixels as per the regional complexity. Adaptive PEE can obtain the embedded rate up to 1.8 bits per pixel as compared to the 1 BPP of conventional PEE. As an intermediate step of prediction error expansion we also propose to select relatively smooth pixels and ignore the rough ones. In other words, the rough pixels may remain unchanged, and only smooth pixels are expanded or shifted. Also we get a more sharply distributed prediction error histogram and a larger proportion of prediction-errors in the histogram are expanded to carry hidden data. So the amount of shifted pixels is diminished, which leads to a better image quality.

KEYWORDS: Reversible Image Watermarking, Adaptive Prediction Error Expansion, Gradient Adjusted Prediction, Pixel Selection (PS)