A Novel Data Embedding Method Using Adaptive Pixel Pair Matching

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ABSTRACT

This paper proposes a new data-hiding method based on pixel pair matching (PPM). The basic idea of PPM is to use the values of pixel pair as a reference coordinate, and search a coordinate in the neighborhood set of this pixel pair according to a given message digit. The pixel pair is then replaced by the searched coordinate to conceal the digit. Exploiting modification direction (EMD) and diamond encoding (DE) are two data-hiding methods proposed recently based on PPM. The maximum capacity of EMD is 1.161 bpp and DE extends the payload of EMD by embedding digits in a larger notational system. The proposed method offers slower distortion than DE by providing more compact neighborhood sets and allowing embedded digits in any notational system. Compared with the optimal pixel adjustment process (OPAP) method, the proposed method always has lower distortion for various payloads. Experimental results reveal that the proposed method not only provides better performance than those of OPAP and DE, but also is secure under the detection of some well-known analysis techniques.