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Computer Science > Information Theory

Short Huffman Codes Producing 1s Half of the Time

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The design of the channel part of a digital communication system (e.g., error correction, modulation) is heavily based on the assumption that the data to be transmitted forms a fair bit stream. However, simple source encoders such as short Huffman codes generate bit streams that poorly match this assumption. As a result, the channel input distribution does not match the original design criteria. In this work, a simple method called half Huffman coding (halfHc) is developed. halfHc transforms a Huffman code into a source code whose output is more similar to a fair bit stream. This is achieved by permuting the codewords such that the frequency of 1s at the output is close to 0.5. The permutations are such that the optimality in terms of achieved compression ratio is preserved. halfHc is applied in a practical example, and the resulting overall system performs better than when conventional Huffman coding is used.

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