

Bachelor/Master Thesis

Resynchronisation of Huffman Codes

Research field

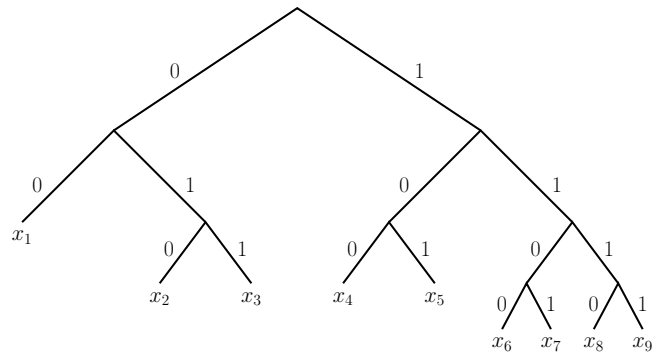
Coding

Keywords

Huffman Code, Entropy

Description

Huffman coding is a standard method of source coding, the task of representing a string of symbols from a source by the shortest bit string that is possible. In case of errors during the transmission of the bit string, such as erroneous bits or even omitted or inserted bits, there are inevitably errors in the symbol string decoded by the receiver, as the Huffman coding does not include any kind of error correction. However, it can be observed that the decoding normally resynchronises itself after some time, so the rest of the symbol string can be decoded correctly. In case of omitted or inserted bits this can only happen if at least some of the code words assigned to the source symbols have different lengths. In general, a high entropy of the source leading to a strongly balanced code tree seems to have a negative impact on the resynchronisation, on average it needs more time than in the case of codes designed for sources with lower entropy. It is advantageous for the resynchronisation if many code words are suffix of other code words. This corresponds with a very unbalanced code tree, although a source inducing such a code does not have minimal entropy.



Goal

The correlation between the average resynchronisation time on the one hand, and the entropy and possibly other characteristics of the input distribution on the other hand, is to be evaluated by simulation.

Requirements

- Good knowledge of theoretical information technology
- Knowledge of programming in languages like C/C++/C# or in MATLAB

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