Programming of the Viterbi decoder of a rate 1/2 convolutional code

Convolutional codes are widely used in telecommunications, cryptography and other fields for error correction and quantization. Modern technology requires codes of high rates, but complexity of the Viterbi algorithm grows with the code rate. At the moment we are working on a new method "merging algorithm" [1] which allows to decrease decoding complexity of high rate convolutional codes. Another approach was suggested in [2].

For the bachelor work we suggest the following plan:
1. Understand convolutional codes and implement Viterbi decoder with classical Forney trellis.

The future work can be:
2. Understand the proposed merging algorithm and make a program to construct the simplified trellis using the algorithm.
3. Implement Viterbi decoder with simplified trellis.
4. Run simulations and compare complexity (time) for Forney trellis and for simplified one.
5. Make item 4 for (may be random) time-variant codes.


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