

IMPLEMENTATION OF A CONVERGENT B-CVA BASED ML DECODER USING CONVOLUTIONAL TAIL BITING TRELLIS

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ABSTRACT

Tail-biting trellises are the simplest of decoding graphs with cycle. Basically, trellis representations not only reveal the code structure, but also lead to efficient trellis based decoding algorithms. Existing Circular Viterbi Algorithms are non-convergent and sub-optimal. In this paper, decoding of convolution code is done over a Rayleigh channel and it is shown that the net path metric of each tail-biting path is lower-bounded during the decoding process of the CVA. This lower bounding property can be applied to remove unnecessary iterations of the existing CVA and results in a bounded or convergent CVA based Maximum Likelihood (ML) decoder. Comparison between the existing two phase ML decoder and the convergent CVA decoder is done over a Rayleigh channel to show that the proposed algorithm has higher efficiency and lower decoding complexity.

KEYWORDS: CVA, Maximum Likelihood (ML) Decoder