

ON ITERATIVE SOURCE-CHANNEL DECODING FOR VARIABLE-LENGTH ENCODED MARKOV SOURCES USING A BIT-LEVEL TRELLIS

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ABSTRACT

In this paper we present a novel bit-level soft-input / softoutput decoding algorithm for variable-length encoded packetized Markov sources transmitted over wireless channels. An interesting feature of the proposed approach is that symbol-based source statistics in form of transition probabilities of the Markov source are exploited as a-priori information on a bit-level trellis. When additionally the variable-length encoded source data is protected by channel codes, an iterative source-channel decoding scheme can be obtained in the same way as for serially concatenated codes. Based on an extrinsic information transfer chart analysis of the iterative decoder computer simulations show for an AWGN channel that by using reversible variable-length codes with free distance greater than one in combination with rate-1 channel codes a reliable transmission is possible even for highly corrupted channels.