

ROBUST TRANSMISSION OF VARIABLE-LENGTH ENCODED MARKOV SOURCES USING RATE-1 CHANNEL CODING AND EFFICIENT ITERATIVE SOURCE-CHANNEL DECODING

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ABSTRACT

In this paper we present a novel low complexity bit-level softinput / soft-output decoding approach for variable-length encoded packetized Markov sources transmitted over noisy communication channels. This approach has the advantage that all available residual source redundancy in form of transition probabilities of the Markov source can be exploited as additional a-priori information in the decoding process. When explicit redundancy from channel codes is additionally added to the interleaved variable-length encoded bit sequence, decoding can be carried out with an iterative source-channel decoding scheme. Furthermore, for reversible variable-length codes, which provide additional explicit source redundancy, good matching rate-1 channel codes are determined via an extrinsic information transfer chart analysis of the iterative decoder such that a robust transmission is possible even for channels with low signal-to-noise ratio.