Joint Source Channel Coding Using Arithmetic Codes

By Khalid Sayood

Morgan & Claypool. Paperback. Book Condition: New. Paperback. 78 pages. Dimensions: 9.2in. x 7.5in. x 0.2in.Based on the encoding process, arithmetic codes can be viewed as tree codes and current proposals for decoding arithmetic codes with forbidden symbols belong to sequential decoding algorithms and their variants. In this monograph, we propose a new way of looking at arithmetic codes with forbidden symbols. If a limit is imposed on the maximum value of a key parameter in the encoder, this modified arithmetic encoder can also be modeled as a finite state machine and the code generated can be treated as a variable-length trellis code. The number of states used can be reduced and techniques used for decoding convolutional codes, such as the list Viterbi decoding algorithm, can be applied directly on the trellis. The finite state machine interpretation can be easily migrated to Markov source case. We can encode Markov sources without considering the conditional probabilities, while using the list Viterbi decoding algorithm which utilizes the conditional probabilities. We can also use context-based arithmetic coding to exploit the conditional probabilities of the Markov source and apply a finite state machine interpretation to this problem. The finite state machine interpretation also allows...

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