

Joint Hybrid Compression Techniques and Convolutional Coding for Wireless Lossy Image Transmissions

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Abstract – This paper demonstrates the effect of color image transmission through AWGN channel using binary phase shift key modulation (BPSK) system and transmission of compressed color image through AWGN. On the other hand, the transmission consumes a large amount of channel and needs the processing, therefore utilizes compression techniques to reduce the size of the original color image to facilitate the transmission compressed color image through AWGN and to obtain the channel optimization. In this paper, a simple hybrid lossy color image compression transmission through AWGN using convolutional coding with Viterbi decoding system is proposed. It is based on combining effective techniques, started by wavelet transform that decompose the image signal followed by polynomial approximation model of linear based to compress approximation image band. The error caused by applying polynomial approximation is coded using bit plane slice coding, whereas the absolute moment block truncation coding exploited to coded the detail sub bands. Then, the compressed information encoded using LZW, run length coding and Huffman coding techniques, the compressed information is entered to the channel coding to coded the information using convolutional coding and modulation using BPSK to transmit through channel and added AWGN, the received signal is demodulated and decoded using Viterbi decoding, the result compressed data passed to source decoding to reconstruct the compressed image. The test results indicated that the proposed system can produce a balance between the compression performance and preserving the image quality, and also simulations results observed that with increase in signal to noise ratio (SNR) values the bit error rate (BER) values decrease.

Keywords – Hybrid lossy image compression, Convolutional coding, Viterbi decoding, AWGN , BPSK.