

Abstract

The Viterbi decoder is the most favorable solution to the problem of decoding codewords from a convolutional encoder. Viterbi decoder performs exceptionally well when a received codewords block contains single or multiple and scattered errors in a received codewords block. However, the formation of burst errors in data transmission due to high transmission speed and the widely varying error conditions of wireless media in fading channel creates decoding challenge for such conditions which result in unbearable amount of residual errors. By using Viterbi decoders' trellis diagrams, this paper analyses the effects of burst errors to the decoder that lead to residual errors and proposes improvement to the encoding and decoding procedures of the existing (2, 1, 2) binary convolutional encoder. The improved version facilitate effectiveness in the decoder (Viterbi algorithm) in decoding burst errors and hence reduction of residual errors in a poor channel. The proposed enhancements improve the decoder's operational performance by 75 percent. However, the proposed modification reduces the encoder's data transmission rate from $1/2$ to $1/6$.