

ABSTRACT

Communication over wireless media is vulnerable to distortion by noise. Therefore, the application of error control mechanism is necessary to minimize the Bit Error Rate (BER). It is proposed to use locked binary convolutional code with Non-Transmittable codewords to enhance Viterbi Algorithm decoders; as one of the forward error correction mechanisms. The proposed enhancement empowers Viterbi algorithm decoders to reduce one of its inherent limitations of residual errors due to burst errors. This paper evaluates the performance of the locked (2, 1, 2) binary convolutional code with Non-Transmittable codewords enhancement technique over flat and slow Rayleigh Fading channel using a MATLAB software simulation. Simulation result shows 80.92 percent reduction of residual errors when 6 Non-Transmittable Codewords were applied to Viterbi Algorithm (VA) decoding. On the other hand, the technique lowers the encoder's data transmission rate from $1/2$ to $1/6$.

General Terms

Binary convolutional codes, Transmission errors, Rayleigh fading channel, Viterbi algorithm.

Keywords

Locked Convolutional encoder, Bust errors, Residual errors, Non Transmittable Codewords (NTCs), Viterbi Algorithm Decoding, Rayleigh Fading Channel