

Abstract—

Researchers have shown that practical mobile communication channels introduce errors that are concentrated in a certain locality rather than random errors. These are burst errors caused by deep fading of the wireless channel or a lightning strike. The existing Viterbi Algorithm (VA) capable of correcting random errors is inefficient in correcting burst errors and therefore resulting in unacceptable amount of residual errors. This paper presents an assessment of Non-Transmittable Codewords (NTCs) enhancement technique to VA in decoding the received signals subjected to burst errors that may occur in poor channels. A hard decision, $1/2$ rate and constraint length K is equal to 3 Viterbi Algorithm decoding technique, Binary Phase-Shift Keying (BPSK) and Additional White Gaussian Noise (AWGN) are components used in MATLAB software based simulation when assessing the proposed technique. Applying 6NTCs to VA decoder enables the decoder to reduce 83.7 percent of its residual errors. However, the technique reduces the encoder's data transmission rate from $1/2$ to $1/6$.

Keywords-

Locked Convolutional encoder; Bust errors; Residual errors; Non-Transmittable Codewords (NTCs); Viterbi Algorithm Decoding; Data Interleaver