

Simplified Decoding Scheme by Selecting Possible Code Words

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Abstract. The aim of this study is to simplify the decoding scheme by selecting possible code words. In this paper the decoding scheme is derived and discussed. Research results show that the simplified decoding Scheme has high capability of correcting errors.

Keywords: Soft decision decoding, block code, channel coding.

1 Introduction

The aim of this study is to simplify the decoding scheme by selecting possible code words [1]. In this paper the decoding scheme is derived and discussed. Research results show that the simplified decoding Scheme has high capability of correcting errors.

A selection method of possible code words in channel coding systems is presented. The proposed method is for channel coding [2] of digital communication systems. Measuring the error correction capability with reunion junction, the proposed method has superior performance and low implementation complexity.

2 Simplification of the Decoding Scheme

The PSD of a linearly modulated signal scales as the magnitude squared of the spectrum of the modulating pulse. The time averages of the signal are the random process as a collection of deterministic signals, or realizations, evolving over time, where the specific realization is chosen randomly.

As with finite-energy signals, the inverse Fourier transform has the interpretation of autocorrelation. The power spectral density is given by

$$y(t) = x^k(t) + z(t) \quad (1)$$

where the approximation neglects edge effects where the approximation neglects edge effects [3].

We need the bits in a realization to exhibit enough variation. In practice, we often use line codes or scramblers specifically designed to avoid long runs of zeros or ones, in order to induce enough transitions for proper operation of synchronization circuits. The pass-band signal

$$SNR = \frac{E_s}{\sigma^2} \quad (2)$$

goes through the channel. The pass-band rating signal is given by

$$r = \frac{C_c}{W} . \quad (3)$$

If all bits take the same value over a realization, then the waveform is simply a constant taking value +1 or -1.

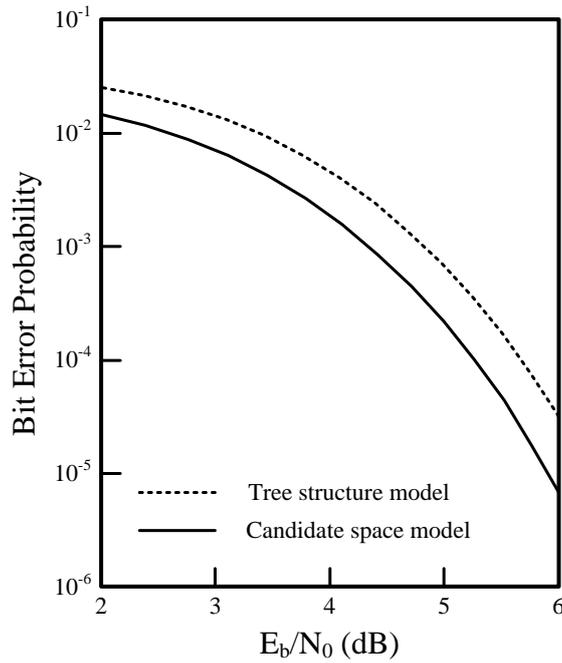


Fig. 1. Performance of the (64, 42, 8) RM code.

3 Simulation Result

In this section, we present the performance of the proposed soft decision decoding algorithm. Figs. 1 depict the performances of the (64,42,8) RM code.

For the sequence to be a discrete delta, the periodic function must be a constant. The faster time decay compared with the pulse is evident from a comparison of the figures. The Nyquist criterion applies to the cascade of the channel and receive filters.

4 Conclusion

The aim of this study is to simplify the decoding scheme by selecting possible code words. In this paper the decoding scheme is derived and discussed. Research results show that the simplified decoding Scheme has high capability of correcting errors.

The proposed method is for channel coding of digital communication systems. The baseband operations can be efficiently performed in DSP. These digital algorithms are independent of the pass-band over which communication eventually occurs, and are amenable to a variety of low-cost implementations, including very large scale integrated circuits, field programmable gate arrays.

References

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