

Project Work
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**Development of a Teaching Tool for the Performance
Investigation of Linear Block Codes**

Abstract

Coding techniques are essentially used to reduce errors in a data transmission system. There are different types of channel coding techniques known as linear block codes, convolution codes and turbo codes. The main objective of this project is to study some of the most popular linear block codes. It is one of the Forward Error Correction (FEC) methods for the transmission of information via a noisy communication channel. The input information is encoded with redundancy allowing the receiver to detect and correct a limited number of errors, avoiding the necessity of retransmission. Among linear block codes, this project investigates the performance of Hamming codes and Golay codes.

Hamming (7,4) code is a linear block code which can detect errors up-to two bits per codeword and can correct only single bit errors. Similarly, Extended Binary Golay (24,12) code can detect and correct double bit errors. Performance investigation of Hamming (7,4) code and Golay (24,12) code was done by using a simulink model and the results are analyzed to obtain a BER graph against error probability (PB) and signal-to-noise ratio (SNR) of the channel.

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