SELECTED READINGS IN COMPUTING AND TELECOMMUNICATIONS

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15. **Prediction of Probability of Bit Error Rate in Digital Communication System**

Saad Osman Bashir, Abdallah Mohammed Tawfeeq Zyoud and Besir Salah
Eldin Mahmoud Sid Ahmed

**Abstract**

The probability of bit error is one of the most important performance parameters in accessing a digital communication system. Since in modern times now people are moving towards digital and leaving behind analog, this performance parameter is of utmost importance especially when designing a digital communication system such as radio data links, fiber optic data systems and Ethernet. This project titled analysis of the probability of bit error rate in digital communication systems will present a formal definition of this performance parameter once that is done important formula to calculate the probability of bit error from some known digital modulation techniques are derived and presented. This project also attempts to show the effect of factors such as noise, interference, fading, and error correcting codes on the bit error rate of these chosen modulation techniques. With the help of Matlab software key graphs will be developed to extensively see and compare the bit error rates under the aforementioned factors for the chosen modulation techniques, all done for the single purpose to predict the probability of bit error rate more confidently.

15.1 **Introduction**

One of the most important aspects or need for modern digital communication systems is to have an end-to-end performance measurement. The measure of that performance is the bit error rate or actually in better