Communication and Information Engineering Program
Digital and Wireless communications
(CIE 428)

Assignment 4

It is required to build Matlab simulations to assess 16-QAM and BFSK passband transmission over AWGN as shown in the figure below.

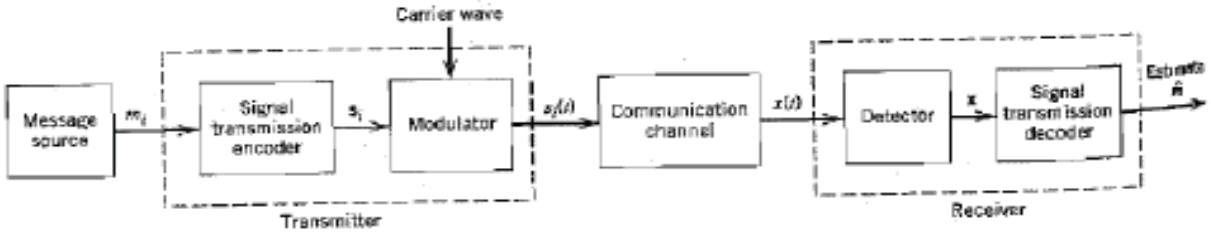

Fig. 1

Description

It is required to generate random binary information stream and send it using **16-QAM** once and using **BFSK** once.
At the receiver side, AWGN $\sim \mathcal{N}(0, N_0/2)$ is added to the information stream. The receiver decodes the received signals using the ML rule.

Deliverables

Deliver the following in **one pdf file**:

1) Source codes (**.m** files with proper comments) of the whole project.
2) Figure of the constellation of transmitted 16-QAM symbols - Use a sort of Gray Encoding and Show which symbol each signal point represents.
3) Figure of the constellation of received noisy 16-QAM symbols.
4) Figure of the constellation of transmitted BFSK symbols.
5) Figure of the constellation of received noisy BFSK symbols.
6) Figure of PSD of the transmitted baseband 16-QAM signal.
7) Figure of PSD of the transmitted baseband BFSK signal.
8) Figure of BERs of 16-QAM, BFSK, both theoretical and through simulations.
9) Comment on your results.

Additional Deliverables

Refer to the deliverables of the previous project and deliver the following in **one pdf file**:

1) Figure of PSD of the transmitted baseband BPSK, QPSK, 16-QAM and BFSK signal - Make sure your axes are normalized properly.
2) Figure of the simulation BERs of BPSK, QPSK, 16-QAM and BFSK.
3) Comment on your results.

Due date 30/11/2019