Birla Institute of Technology & Science, Pilani, Rajasthan
First Semester 2021-2022
Lab-10 Matched Filtering

Course: EEE F311 Communication Systems
Instructor-in-Charge: S M Zafaruddin

25-11-2021 THURSDAY(P1, P3:): MATLAB/Python

Objective

In this task, the objective is to transmit binary data and detection using Matched Filter.
Send your word doc: https://www.dropbox.com/request/fanzNiYZWUAg1mqQQSFU

In previous labs, we have already converted a sentence into binary digits. In this task, write your full name and convert it to binary digits. Your name as digital data will be transmitted as base band over a bandwidth-unlimited channel $h(t) = \delta(t)$. The binary data will be line encoded as an NRZ polar pulse. Thus for binary digit '1' transmit $\Pi(t/T)$ and for binary digit '0' transmit $-\Pi(t/T)$. Use the real time code to show the data transmissions for whole duration for transmission rate 2 pulses per second, where each pulse contains a single bit. A MATLAB code is uploaded to Nalanda. You can use slides for reference. Internet/email access is not allowed.

- Add AWGN and apply a matched filter at the receiver to detect the corresponding bit stream, thus receive you full name. Demonstrate the impact of additive noise by changing noise power.
- Repeat the above task by applying a band-limited channel instead of $h(t) = \delta(t)$.