EE321: Communication Systems **EE Dept. IITK**

MATLAB Assignment-4

Viterbi Decoder *April 2025*

The objective of this assignment is to implement Viterbi Decoder.

1. We employ BPSK modulation, with $b[n] \in [-1, +1]$ and use the pulse considered in the class for which we know that $h[0] = 3/2$, $h[1] = h[-1] = -1/2$, $h[n] = 0$ for $|n| \geq 1$. Suppose we know $b[0] = b[9] = +1$ and samples at output of matched filter are

$$\begin{aligned} y[0] &= -1, y[1] = 2, y[2] = -2, y[3] = 1.5 \\ y[4] &= 2, y[5] = 1 y[6] = -2, y[7] = 0.5 \\ y[8] &= -1, y[9] = 2 \end{aligned}$$

   Implement the Viterbi decoder and decode the transmit bit sequence $b[1]$ to $b[8]$.

Please follow these Coding instructions:

- Properly comment your code.
- Code should execute and generate the desired output.
- Your submission should be self-contained (should include all the files required for running it).
- Avoid hard-coding the values of the variables for specific configurations. Code should be generic.

Please follow these submission instructions.

- Deadline is Aprl. 25th, 11:59 pm.
- All codes and documents should be in one .zip/.rar folder, and submit one zip file.
- Name your code as rollno.zip. and upload your properly commented in drive link below. `https://tinyurl.com/d4wjyvcp`
- Please do not mail your file to us.

Please also read this carefully.

- Each one of you have to individually do all the reading and MATLAB assignments. You can discuss with your friends but you will have to completely write your own code.
- Copying also means sharing your code with some else for them to copy. We will not differentiate between two acts, and both such cases will be awarded zero. Our decision will be final.