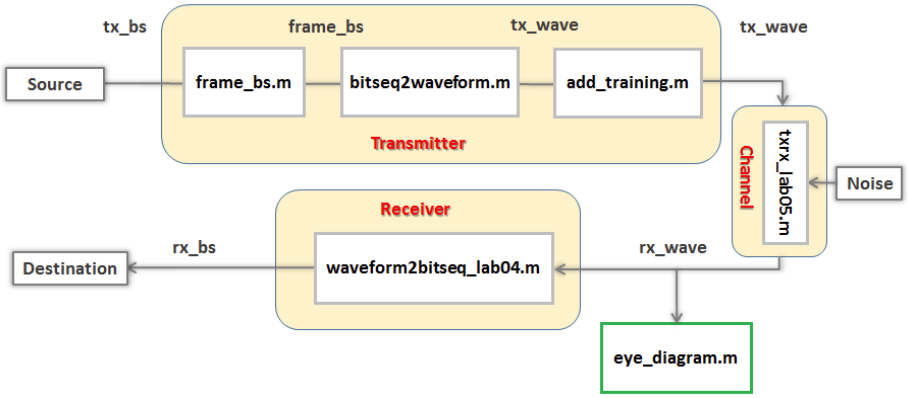
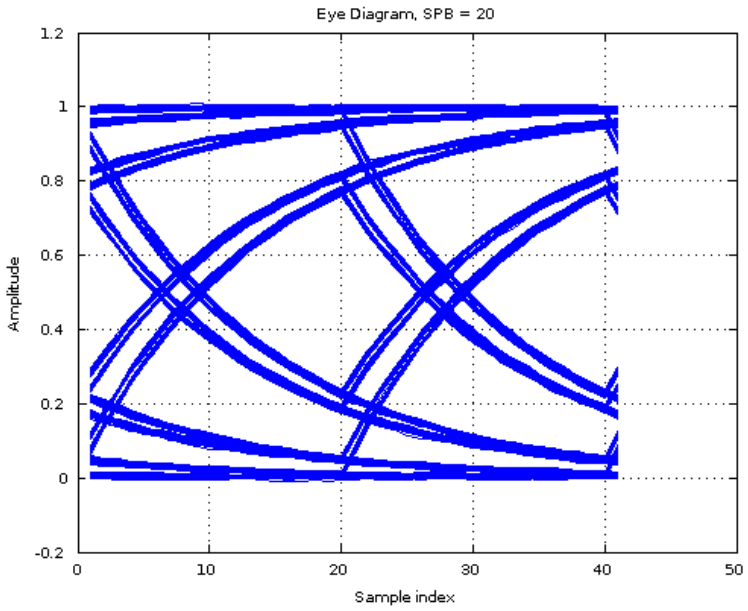
LAB 5 TASK 1 - GENERATE EYE DIAGRAM (1 point possible)

In this task, you will write code implementing the MATLAB function, **eye_diagram.m**, which is highlighted in green below. This function generates the eye diagram of the received waveform to visualize inter-symbol interference (ISI).



Incorrect

Figure 1



- X data of trace 1 is not the expected value.

Check Reset Save *You have used 2 of 10 submissions*

INSTRUCTIONS

Let's first look at how the code works. The first two code lines define a random 1280-bit sequence and the bit time of 20 samples per bit. The function **format_bitseq**, which you have written, encapsulates the bit sequence into a frame and adds the training sequence. The resulting waveform is transmitted over the channel simulated by function **txrx_lab05**. On the receiver side, the function **find_start** returns the index of the first sample of the start bit.

Step 1: Run the code as presented

After you click on the **Run Code** button to run the MATLAB code as presented, you will see an empty figure labelled with the title "Eye Diagram, SPB = 20". Your task is to write code that fills the figure with the eye diagram of the received waveform **rx_wave**.

Step 2: Plot the eye diagram of received waveform

To complete this task, you should add code under the comments starting with

```
% Place your code below that
```

This code should create the eye diagram of `rx_wave` that satisfies the following criteria.

1. The eye diagram contains 640 overlapping traces showing segments of 2*SPB+1 samples from rx_wave.

2. The first segment should start from the index `start_ind`.

3. Segments should be spaced by 2*SPB.

4. Each trace should be plotted versus indices running from 0 to 2*SPB.

*Hint: to superimpose all the traces on the same plot, you can use command **hold on**. For more details, see the video* Multiple Plots (/courses/HKUSTx/ELEC1200.1x/3T2014/jump_to_id/323f8adb3bf94250b0de9e45b5fc73a3).

Examine the eye diagram that is generated. Find the height and width of the eye from the diagram. Does the eye appear "open" to you?

Help

Step 3: Submit your work

Once you have completed your work, click on the **Check** button to submit your answer.