Assignment - 9
Design of IIR and FIR Filters

April 21, 2018

Read the file almostcaught_noisy.wav provided on piazza. The file has an audio clip with some noise added to it. Your task is to remove or reduce the noisy as much as possible.

Task 1

1. What should be the five specifications (two passband ripples, two cutoff frequencies and a stopband ripple) of the desired filter. Looking at the spectrum of the input signal may be helpful.
2. Design an IIR filter on paper to reduce the noise in the signal using Butterworth analog filter.
3. Write MATLAB code to design IIR low pass Butterworth filters. Your function should take five filter specification parameters(two passband ripples, two cutoff frequencies and a stopband ripple). The output of the filter should be the coefficients of numerator and denominator of the transfer function $H(z)$ of the filter.
4. Compute the frequency response of the filter. Does it fulfill your requirements?

Task 2

1. Repeat Task 1 using FIR filter design (windowing technique).