Signal Processing Project #2: Filtering ECG Signal

Ahmet Taha Koru

Due to: 20/10/2017

Write a Matlab script to filter noisy ECG signal. Download *noisy_ecg.mat* from Avesis page. Load the mat file in Matlab. Filter the ECG signal 0 - 40 Hz frequency range. Note that the sampling frequency is 500 Hz in the data.

1. Calculate the filter coefficients of the low pass filter with 40 Hz cut-off frequency via inverse discrete-time Fourier transform of ideal filters. Use $h[n]$ values in the interval $-30 \leq n \leq 30$.
2. Plot the impulse response of the low-pass filter. Use *stem* function to plot in Matlab.
3. Filter the noisy data with the calculated filter by using both *filter* and *filtfilt* functions of Matlab. What is the difference between them? Comment.
4. Plot the noisy and filtered ECG signals.
5. Plot the magnitude of the frequency spectrum of noisy and filtered ECG signal .