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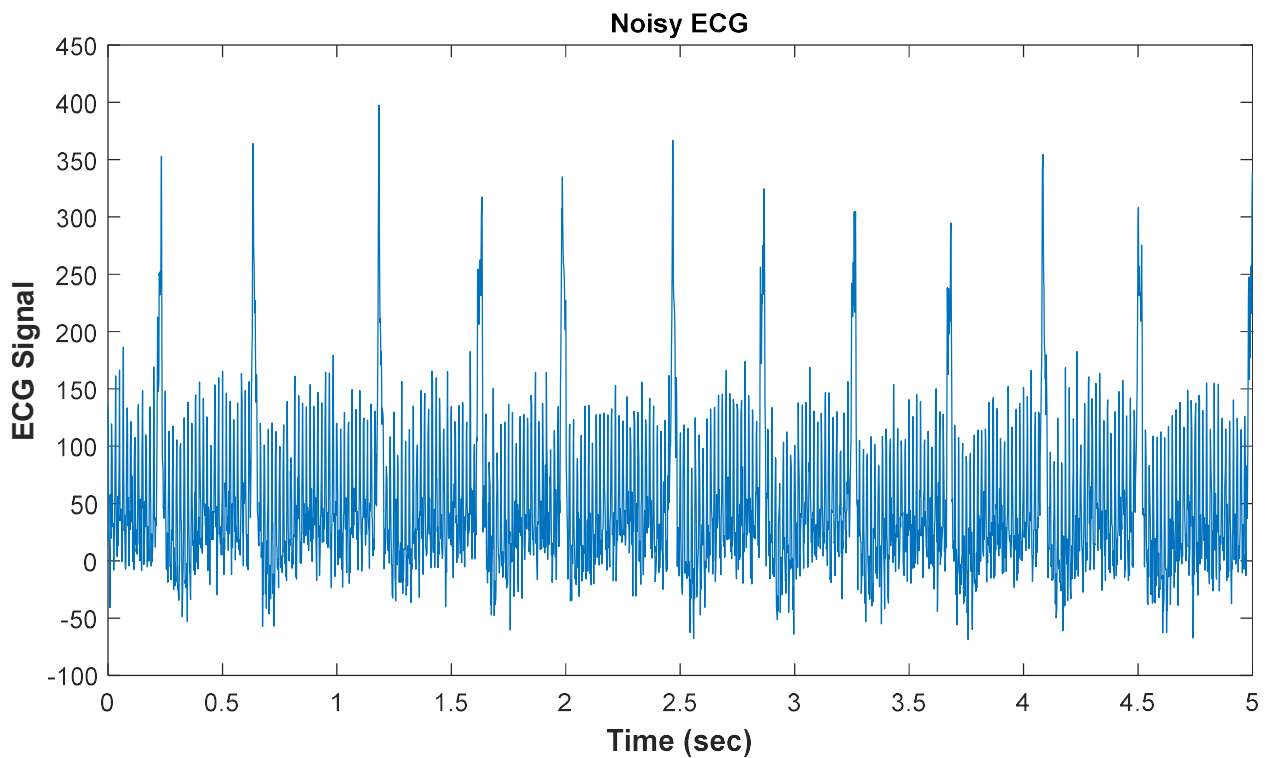
BMEN 3302.501 Bioengineering Signals and Systems

Mini project 2

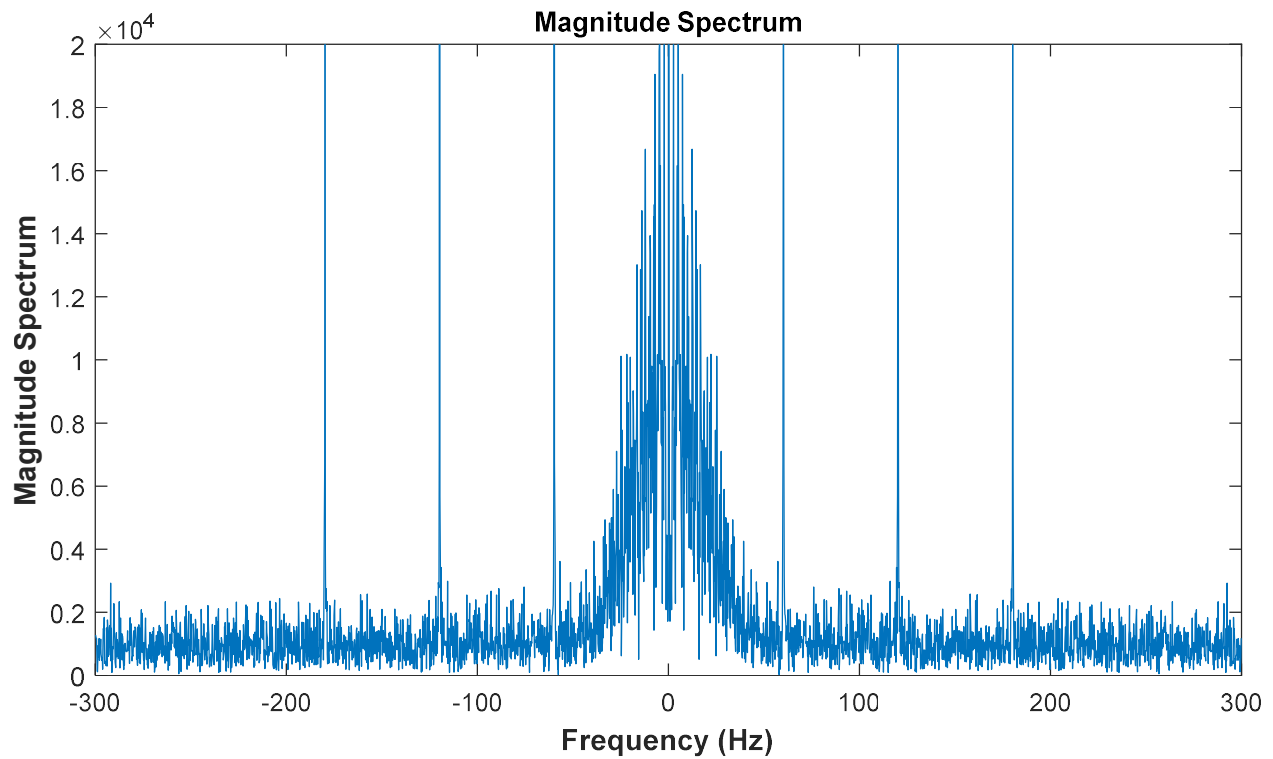
10/10/2022

Steps:

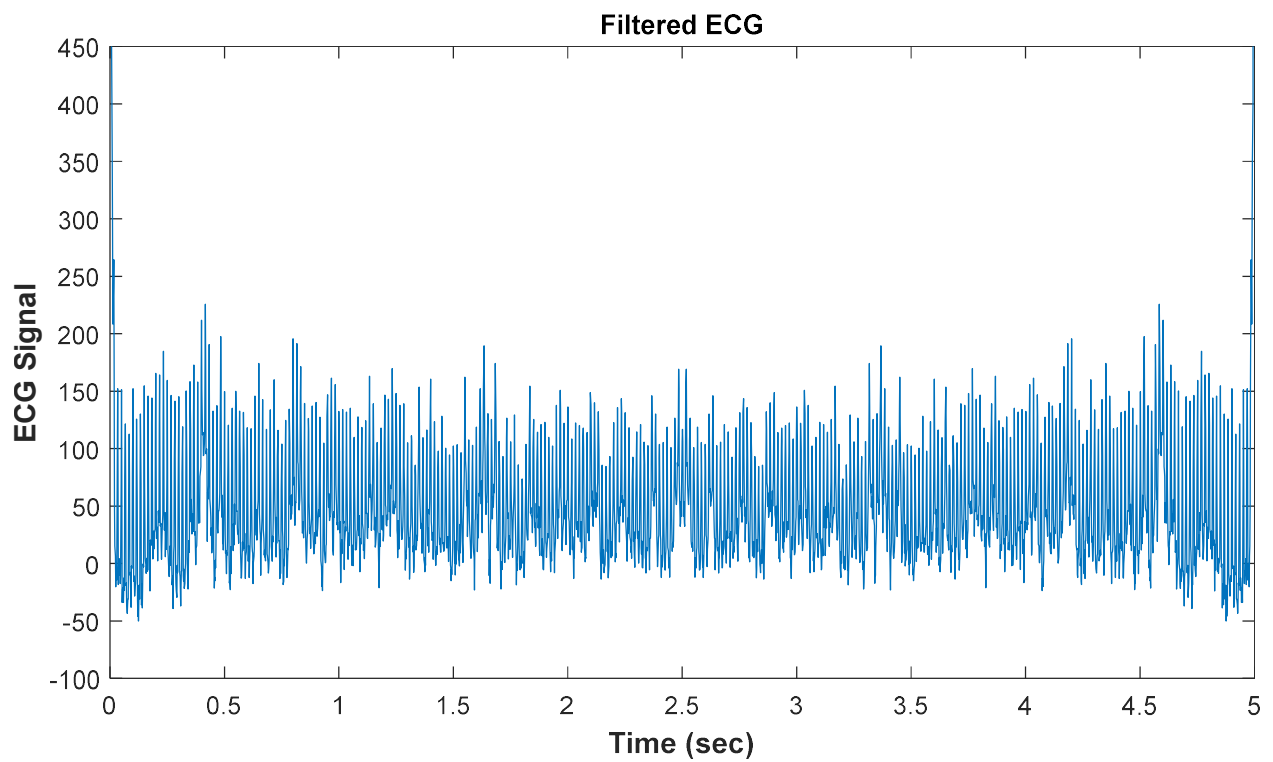
- Load the original ECG signal
- Calculate F_s and T_s
- Frequency ranges from -300 to 300 with increment of $F_s/\text{length of signal}$
- Take Fourier Transform by `fft` on original signal, and take the `abs()` of it
- Apply filter:
 - I tried applying filters manually using `band-reject`, but it did not work very well.
 - I then decided to use `rmoutliers`, which is a function to remove outliers.
- Take the inverse Fourier Transform of the filtered signal by `ifft()`.
- Plot each with appropriate labels.



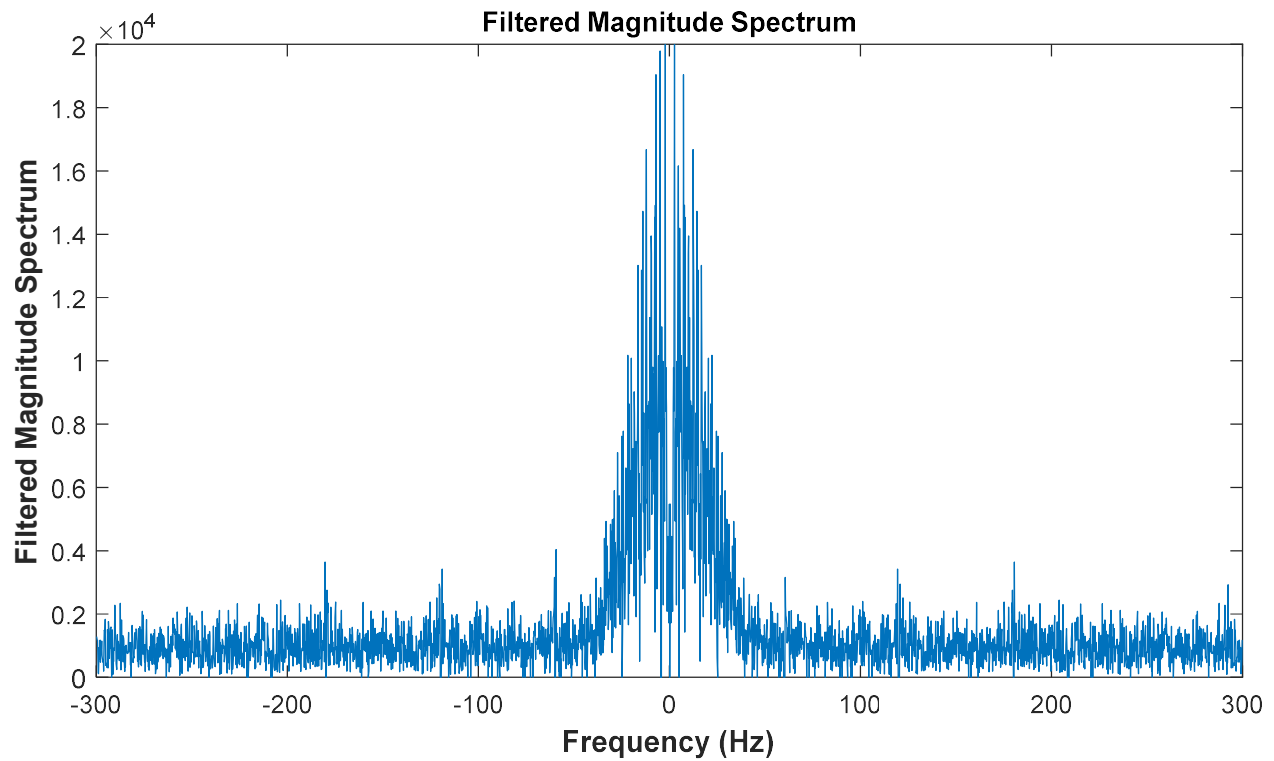
Noisy signal with a few peaks representing the wanted signal.



Noisy magnitude spectrum with a few peaks representing the frequencies of the noise.



This is supposed to be the filtered ECG. However, I tried different methods for filtering the magnitude spectrum but none of them seemed to work. Thus, no apparent signal is shown.



Filtered magnitude spectrum. Filter is applied using outlier removal function. I tried a few different methods for filtering, and all seemed to have worked on the magnitude spectrum. However, when inverse Fourier Transform is applied to get the time domain signal, none of them seemed to have worked.