

521273S - Biosignal Processing I - Online Labs - Autumn 2024 (/courses/157000-521273s-biosignal-processing-i-online-labs-autumn-2024)

➤ Assignment 1 - Respiration analysis (/courses/157000-521273s-biosignal-processing-i-online-labs-autumn-2024/assignments/449045-assignment-1-respiration-analysis)

▼ Assignment 2 - ECG Filtering to Remove Noise (/courses/157000-521273s-biosignal-processing-i-online-labs-autumn-2024/assignments/449050-assignment-2-ecg-filtering-to-remove-noise)

✔ Load and select data (/courses/157000-521273s-biosignal-processing-i-online-labs-autumn-2024/assignments/449050-assignment-2-ecg-filtering-to-remove-noise/problems/1664180-load-and-select-data)

✔ Compute power spectrum (/courses/157000-521273s-biosignal-processing-i-online-labs-autumn-2024/assignments/449050-assignment-2-ecg-filtering-to-remove-noise/problems/1664185-compute-power-spectrum)

✔ Moving average filtering (/courses/157000-521273s-biosignal-processing-i-online-labs-autumn-2024/assignments/449050-assignment-2-ecg-filtering-to-remove-noise/problems/1664190-moving-average-filtering)

✔ Derivative based filtering (/courses/157000-521273s-biosignal-processing-i-online-labs-autumn-2024/assignments/449050-assignment-2-ecg-filtering-to-remove-noise/problems/1664195-derivative-based-filtering)

✔ Comb filtering (/courses/157000-521273s-biosignal-processing-i-online-labs-autumn-2024/assignments/449050-assignment-2-ecg-filtering-to-remove-noise/problems/1664200-comb-filtering)

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Assignment 2 - ECG Filtering to Remove Noise

Visible: 04 Nov 2024 8:00 AM EET | **Due:** 12 Nov 2024 11:45 PM EET | **Submissions Per Problem:**

Assignment Description

After this assignment student can * remove high-frequency noise from signal * remove low-frequency noise from signal * remove power-line interference

Background Read chapter 3 from the course book.

ECG signals are often contaminated with a combination of high-frequency noise, low-frequency noise (base removed by applying a lowpass filter and low-frequency noise may be removed by applying a highpass filter) distortions in ECG signal, such as excessive smoothing or widening of the QRS complex, and distortion of F

Useful MATLAB commands fft, filter, freqz, nextpow2, conj, ones, conv, semilogy, sgolayfilt

Problems

✔ Load and select data (/courses/157000-521273s-biosignal-processing-i-online-labs-autumn-2024/assignment-2-ecg-filtering-to-remove-noise/problems/1664180-load-and-select-data)

✔ Compute power spectrum (/courses/157000-521273s-biosignal-processing-i-online-labs-autumn-2024/assignment-2-ecg-filtering-to-remove-noise/problems/1664185-compute-power-spectrum)

✓ Cascaded filtering (/courses/157000-521273s-biosignal-processing-i-online-labs-autumn-2024/assignments/449050-assignment-2-ecg-filtering-to-remove-noise/problems/1664205-cascaded-filtering)

➤ Assignment 3 - Adaptive filtering (/courses/157000-521273s-biosignal-processing-i-online-labs-autumn-2024/assignments/449055-assignment-3-adaptive-filtering)

➤ Assignment 4 - Pan-Tompkins Algorithm for QRS Detection (/courses/157000-521273s-biosignal-processing-i-online-labs-autumn-2024/assignments/449060-assignment-4-pan-tompkins-algorithm-for-qrs-detection)

➤ Assignment 5 - EMG and Muscular Force Analysis (/courses/157000-521273s-biosignal-processing-i-online-labs-autumn-2024/assignments/449065-assignment-5-emg-and-muscular-force-analysis)

➤ Assignment 6 - Frequency-Domain Analysis of Heart Sounds (/courses/157000-521273s-biosignal-processing-i-online-labs-autumn-2024/assignments/449070-assignment-6-frequency-domain-analysis-of-heart-sounds)

✓ Moving average filtering (/courses/157000-521273s-biosignal-processing-i-online-labs-autumn-2024/assignments/449050-assignment-2-ecg-filtering-to-remove-noise/problems/1664190-moving-average-filtering)

✓ Derivative based filtering (/courses/157000-521273s-biosignal-processing-i-online-labs-autumn-2024/assignments/449050-assignment-2-ecg-filtering-to-remove-noise/problems/1664195-derivative-based-filtering)

✓ Comb filtering (/courses/157000-521273s-biosignal-processing-i-online-labs-autumn-2024/assignment-filtering-to-remove-noise/problems/1664200-comb-filtering)

✓ Cascaded filtering (/courses/157000-521273s-biosignal-processing-i-online-labs-autumn-2024/assignment-filtering-to-remove-noise/problems/1664205-cascaded-filtering)

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