Orientation

03 August 2021 21:12

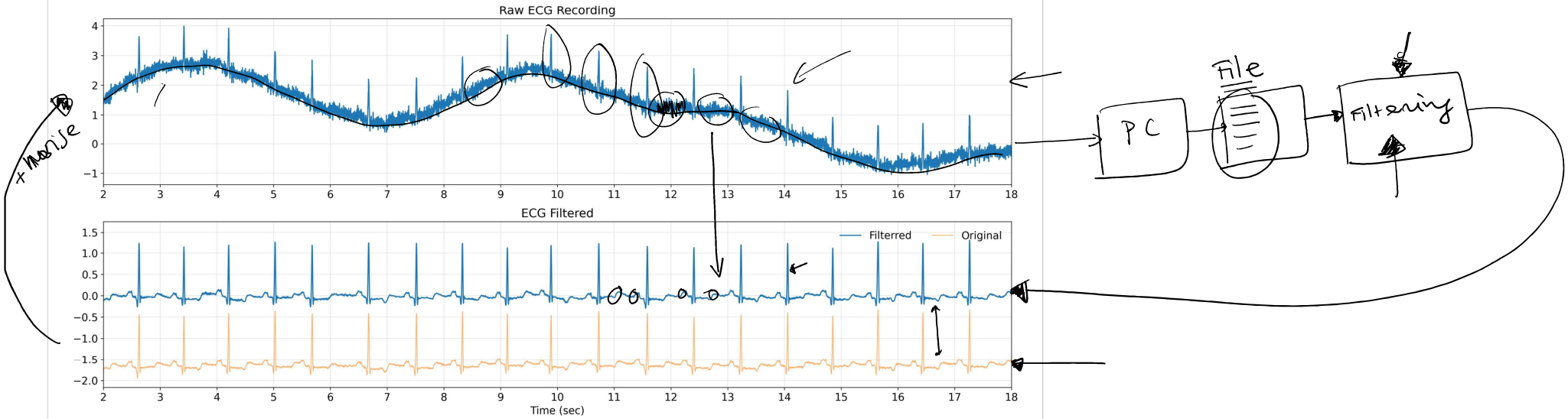
Introduction to Digital Signal Processing

Sivakumar Balasubramanian

Dept. of Bioengineering

Christian Medical College Vellore

What is this course about?



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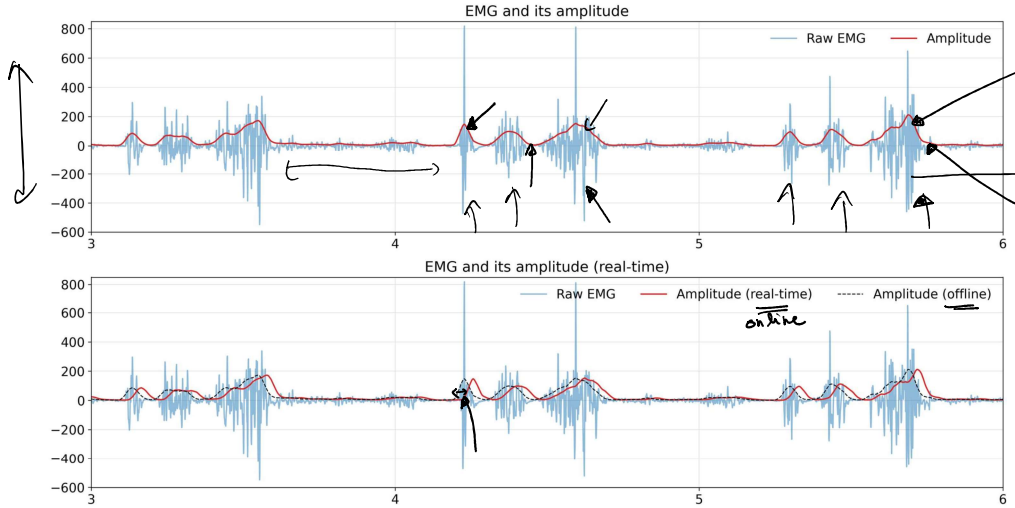

EMG amplitude ≠ Force of the muscle

Amplitude estimation

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Filter (LP)

Past, present, future of the signal

offline processing

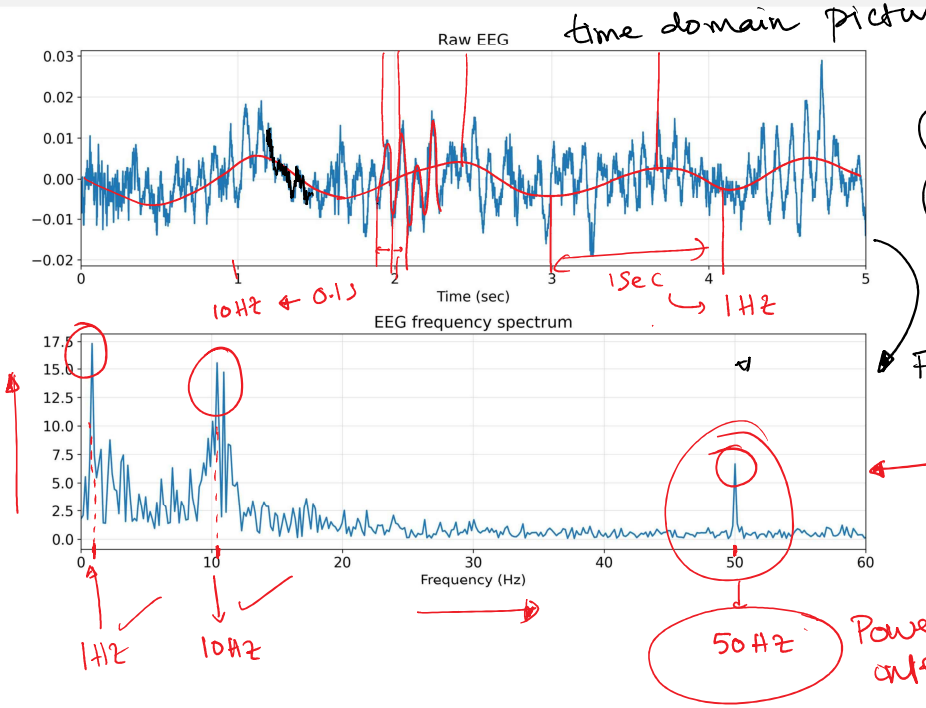
data that is pre-recorded.

online processing

No Past, present

why? → causal vs. non-causal systems

What is this course about?



time domain picture

Frequency Spectrum

1. 10Hz oscillation
2. 1Hz oscillation
3. High frequency variation

10Hz ← 0.1s

1Sec → 1Hz

Frequency domain picture

Frequency Spectrum (Magnitude Spectrum)

1Hz

10Hz

50Hz Power line interference

- What is freq Spectrum?
- How do we compute?
- How do we interpret?
- What are the limitations?

Specific topics covered

- Mathematical preliminaries
- Python programming
- What are signals?
- Sampling theorem
- Discrete Fourier Transform (DFT) Fourier representation on a computer.
- Frequency selective filters ← Spec., design, how to use
- Introduction to spectral analysis
- Short-time Fourier transform

- What are signals?
- Sampling theorem
- What are systems?
- Linear time-invariant systems
- Convolution
- Fourier representation of signals → Freq. representation of signals
- Z-transform*
- Introduction to spectral analysis
- Short-time Fourier transform
- Introduction to Wavelet transform*

Assignments, Quizzes, and Exams

- One assignment per week, due on Monday the following week. ← 3 assignments. — 25%
- One quiz per week. ← — 15%
- Midterm on the 2nd week of October — 10%
- Final on the third week of December — 50%

90 min: 530 PM – 7PM every friday
- clarifying doubts
- Doing some tutorial problems.