Biosignal Processing

Assignment 1: Extract basic features from a photoplethysmography signal

Implement a Matlab function with the following interface:
Input argument: Path to an EDF file
Return value: Matrix with extracted features

From the input EDF file, read the signal with the label “wrist_ppg” (wrist-worn photoplethysmography) and apply a bandpass filter to reject non-cardiac frequencies from the signal. Segment the data into 60-second windows and extract the following set of features for each time window:

1. Statistical features time domain
    a. Mean
    b. Variance
2. Frequency domain features based on fourier transform
    a. Peak frequency (frequency with maximum power)
    b. Median frequency
    c. Mean frequency
3. Time domain features based on inter-beat intervals
    a. Mean inter-beat interval
    b. Variance of inter-beat intervals
    c. Skewness of the distribution of inter-beat intervals

The resulting matrix shall contain one row per time window and 8 columns for the extracted features.

Submit your Matlab code including all required scripts in Moodle by October 9, 2020. Submit only once per group.