|  |
| --- |
| A = xlsread('a01\_3.csv'); %csv file need to be inserted in a current directory |
|  | samples = 0:length(A)-1; % Sample Indices Vector |
|  | Fs = 250; % Sampling Frequency (Hz) |
|  | t = samples/Fs; % Time Vector (seconds) |
|  | % plotting ecg data wrt time |
|  | figure |
|  | plot(t,A); |
|  | title('ECG Signal'); |
|  | xlabel('Time (s)'); |
|  | ylabel('Voltage (V)'); |
|  |  |
|  | % computing ad ploting amplitude spectrum |
|  | L = length(A) |
|  | Y = fft(A) |
|  | P2 = abs(Y/L); |
|  | P1 = P2(1:L/2+1); |
|  | P1(2:end-1) = 2\*P1(2:end-1); |
|  | f = Fs\*(0:(L/2))/L; |
|  | figure |
|  | plot(f,P1); |
|  | ylim([0 0.1]); |
|  | title('Amplitude Spectrum of ECG Signal'); |
|  | xlabel('f (Hz)'); |
|  | ylabel('Magnitude |P1(f)|'); |
|  |  |
|  | data = A - 8; %remove dc offset |
|  | figure |
|  | plot(t(1,1:(2501)),data(1:(2501),1)); |
|  | title('First 10 Seconds of ECG Data'); |
|  | xlabel('Time (s)'); |
|  | ylabel('Voltage (V)'); |
|  | data\_10s = data(1:(2501),1); |
|  | time\_10s = t(1,1:(2501)); |
|  |  |
|  | % last 10 sec |
|  | data\_Last10s = data(12501:15000,1); |
|  | time\_Last10s = t(1,12501:15000); |
|  |  |
|  | % average p wave QRST( pan tompkin) Detection function |
|  | pqrst\_times = [0.42,1.22,2.06,2.87,3.70,4.55,5.31,6.07,6.79,7.53,8.25,8.97,9.77]; |
|  | pqrst\_length = length(pqrst\_times) - 1; |
|  | d = 1; |
|  | periods = []; |
|  |  |
|  | for c = 1:pqrst\_length |
|  | period = pqrst\_times(c+1) - pqrst\_times(c); |
|  | periods(d) = period; |
|  | d = d + 1; |
|  | end |
|  |  |
|  | pqrst\_avg\_T = mean(periods); |
|  | pqrst\_avg\_f = 1 / pqrst\_avg\_T; |
|  |  |
|  | % QRS Calling |
|  | [peaksFirst10s,locationsFirst10s,processedQRSDataFirst10s] = qrsTiming(data\_10s,time\_10s); |
|  | disp(locationsFirst10s) |
|  |  |
|  | %plotting the result |
|  | figure |
|  | subplot(2,1,1) |
|  | plot(time\_10s,data\_10s); |
|  | title('ECG Signal First 10 Seconds'); |
|  | xlabel('Time (s)'); |
|  | ylabel('Voltage (V)'); |
|  |  |
|  | subplot(2,1,2) |
|  | plot(time\_10s,processedQRSDataFirst10s,locationsFirst10s,peaksFirst10s,'or'); |
|  | title('QRS Detection on First 10 Seconds of ECG Signal'); |
|  | xlabel('Time (s)'); |
|  |  |
|  | % Calling QRS Detection Function for Last 10s |
|  | figure |
|  | plot(time\_10s,data\_10s,locationsFirst10s,data\_10s((locationsFirst10s\*250)+1),'or'); |
|  | title('First 10 Seconds of ECG Data Dectected QRS Peaks'); |
|  | xlabel('Time (s)'); |
|  | ylabel('Voltage (V)'); |
|  |  |
|  | % Plotting of Last 10s Detected Points |
|  | locLast = locationsLast10s-50; |
|  | locLast = uint32(locLast\*250) + 1; |
|  | figure |
|  | plot(time\_Last10s,data\_Last10s,locationsLast10s,data\_Last10s(locLast),'or'); |
|  | title('Last 10 Seconds of ECG Data Dectected QRS Peaks'); |
|  | xlabel('Time (s)'); |
|  | ylabel('Voltage (V)'); |
|  | ylabel('Voltage (V)');   |  | | --- | | A = xlsread('a01\_3.csv'); %csv file need to be inserted in a current directory | |  | samples = 0:length(A)-1; % Sample Indices Vector | |  | Fs = 250; % Sampling Frequency (Hz) | |  | t = samples/Fs; % Time Vector (seconds) | |  | % plotting ecg data wrt time | |  | figure | |  | plot(t,A); | |  | title('ECG Signal'); | |  | xlabel('Time (s)'); | |  | ylabel('Voltage (V)'); | |  |  | |  | % computing ad ploting amplitude spectrum | |  | L = length(A) | |  | Y = fft(A) | |  | P2 = abs(Y/L); | |  | P1 = P2(1:L/2+1); | |  | P1(2:end-1) = 2\*P1(2:end-1); | |  | f = Fs\*(0:(L/2))/L; | |  | figure | |  | plot(f,P1); | |  | ylim([0 0.1]); | |  | title('Amplitude Spectrum of ECG Signal'); | |  | xlabel('f (Hz)'); | |  | ylabel('Magnitude |P1(f)|'); | |  |  | |  | data = A - 8; %remove dc offset | |  | figure | |  | plot(t(1,1:(2501)),data(1:(2501),1)); | |  | title('First 10 Seconds of ECG Data'); | |  | xlabel('Time (s)'); | |  | ylabel('Voltage (V)'); | |  | data\_10s = data(1:(2501),1); | |  | time\_10s = t(1,1:(2501)); | |  |  | |  | % last 10 sec | |  | <td id="gmail-LC37" class="gmail-blob-code gmail-blob-code-inner gmail-js-file-line" style="box-sizing:border-box;padding:0px 10px;line-height:20px;vertical-align:top;ove | |