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```
close all;
clear all
```

loading data fs =1000

```
ppg=load('10_2.txt');
fs=1000;
t=0:1/fs:(length(ppg)/fs);
```

PPG filtering 1 20 hz

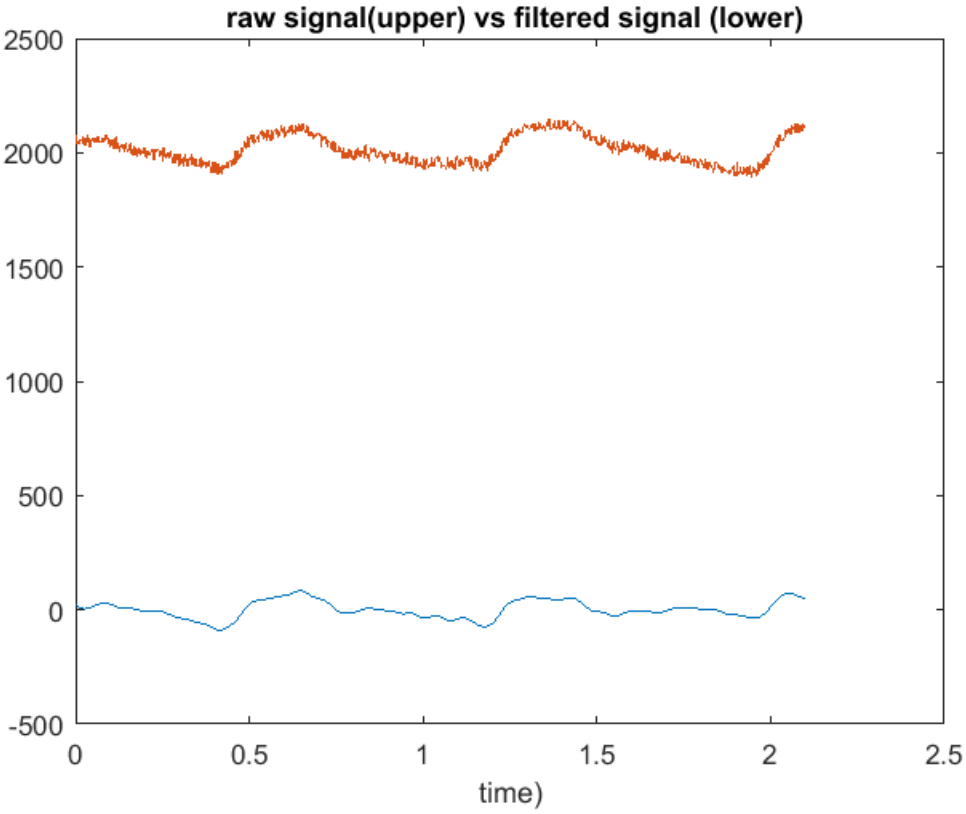
```
[A,B,C,D] = cheby2(5,20,[1 20]/500);

[filter_SOS,g] = ss2sos(A,B,C,D);

x = filtfilt(filter_SOS,g,ppg);
```

for time anaylsis

```
plot(t(1:length(ppg)),x)
hold on
plot(t(1:length(ppg)),ppg)
title(' raw signal(upper) vs filtered signal (lower)')
xlabel('time)')
figure;
```

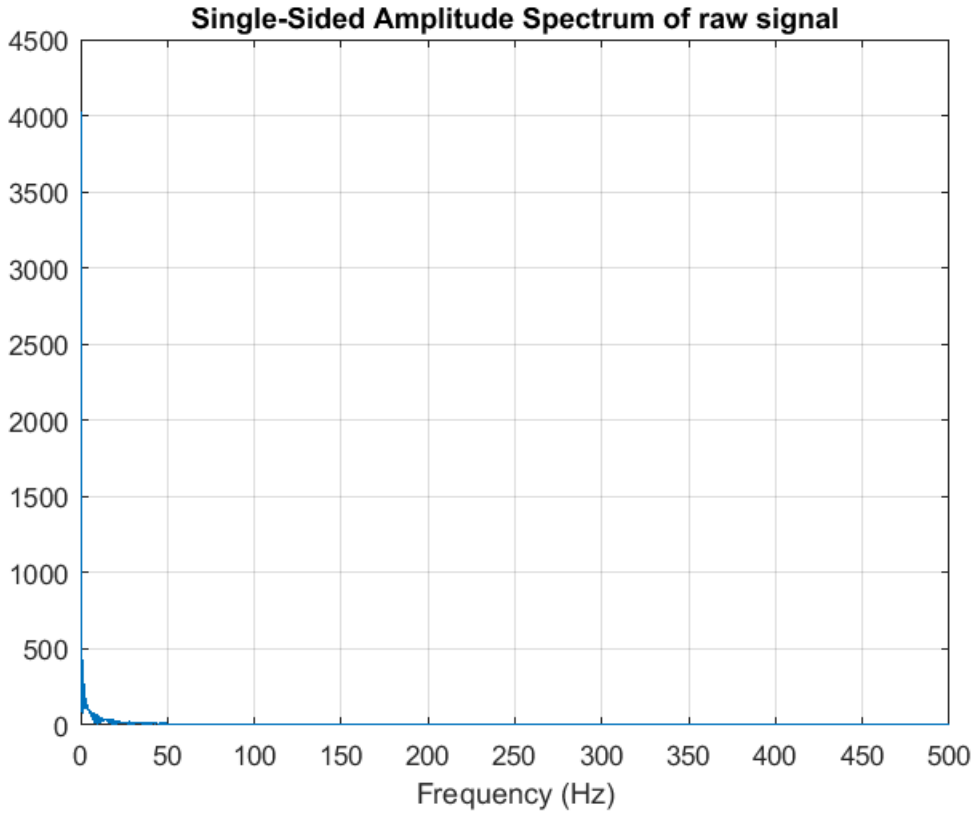

raw signal(upper) vs filtered signal (lower)
2500
2000
1500
1000
500
0
-500
0
0.5
1
1.5
2
2.5
time)

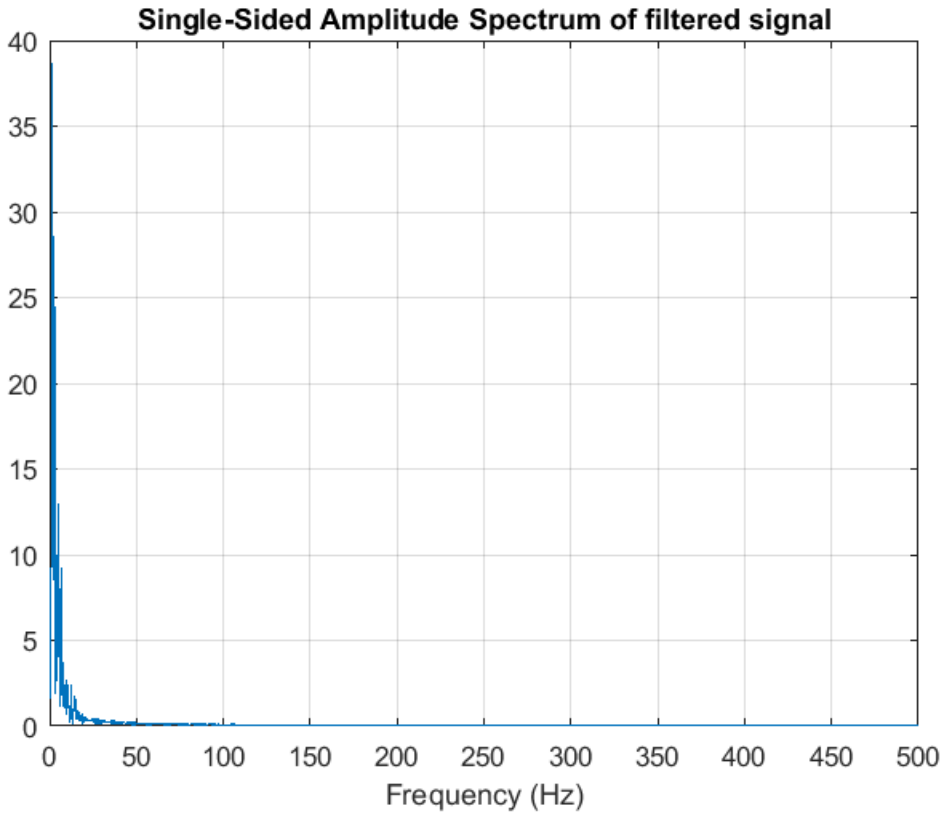
for frequencey anaylsis FFT of PPG signal

```
Fs=fs;
L=length(ppg);
NFFT = 2^nextpow2(L);% Next power of 2 from length of y
Y = fft(ppg,NFFT)/L;
f = Fs/2*linspace(0,1,NFFT/2+1);
% Plot single-sided amplitude spectrum.
plot(f,2*abs(Y(1:NFFT/2+1))),grid on
title('Single-Sided Amplitude Spectrum of raw signal')
xlabel('Frequency (Hz)')
figure;


Fs=fs;
L=length(x);
NFFT = 2^nextpow2(L);% Next power of 2 from length of y
Y = fft(x,NFFT)/L;
f = Fs/2*linspace(0,1,NFFT/2+1);
% Plot single-sided amplitude spectrum.

plot(f,2*abs(Y(1:NFFT/2+1))),grid on
title('Single-Sided Amplitude Spectrum of filtered signal')
xlabel('Frequency (Hz)')
```

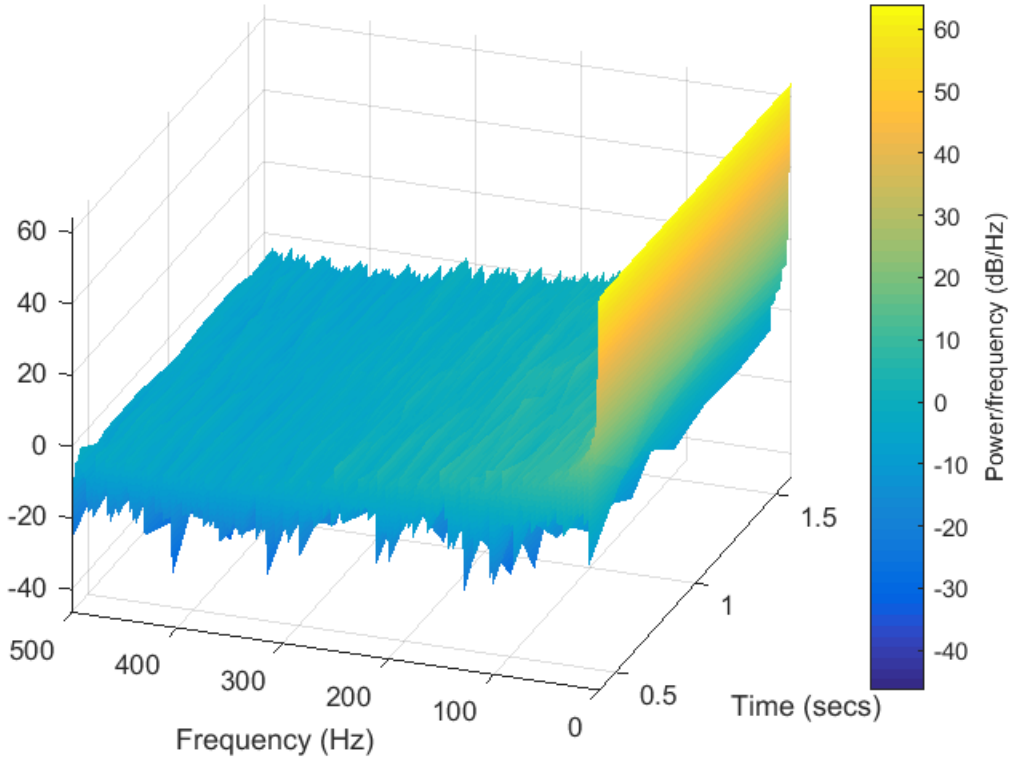


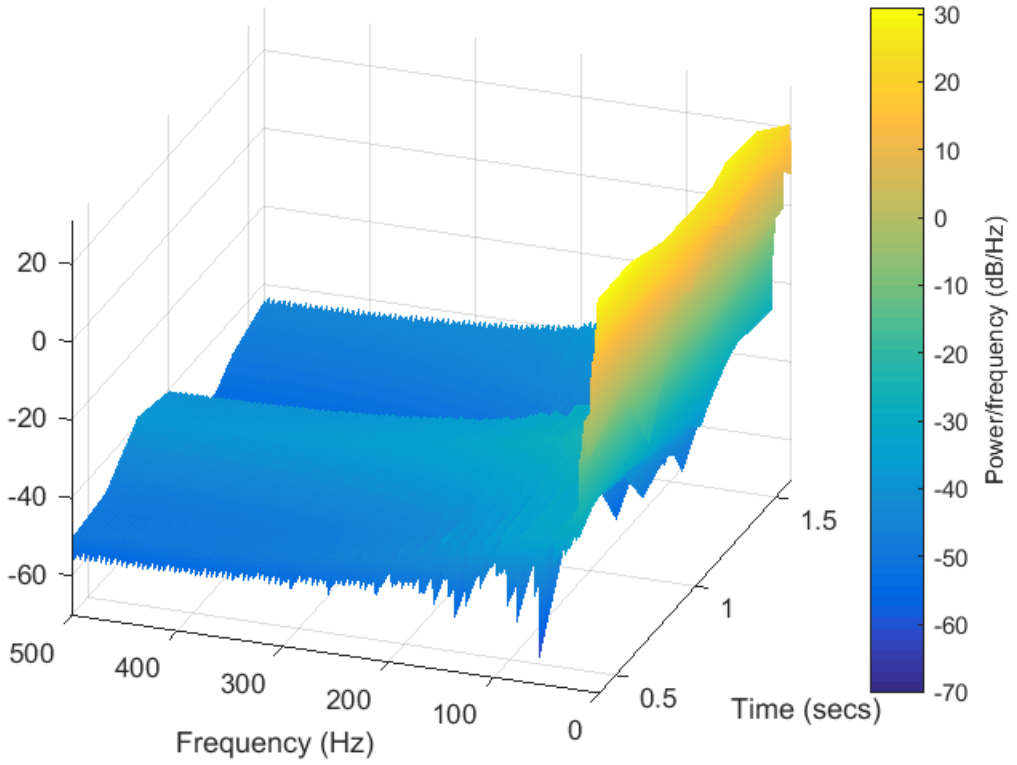


for time vs frequencey spectrogram

```
figure;
spectrogram(ppg,800,600,1000,Fs,'yaxis');
view(-70,30);
shading interp;

figure;
spectrogram(x,800,600,1000,Fs,'yaxis');
view(-70,30);
shading interp;
```


60
40
20
0
-20
-40
500
400
300
200
100
0
Frequency (Hz)
0.5
1
1.5
Time (secs)
60
50
40
30
20
10
0
-10
-20
-30
-40
Power/frequency (dB/Hz)


20
0
-20
-40
-60
500
400
300
200
100
0
Frequency (Hz)
0.5
1
1.5
Time (secs)
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
Power/frequency (dB/Hz)

lets do same for differnt ppg signal

loading data fs =1000

```
ppg=load('11_2.txt');
fs=1000;
t=0:1/fs:(length(ppg)/fs);
```

PPG filtering 1 20 hz

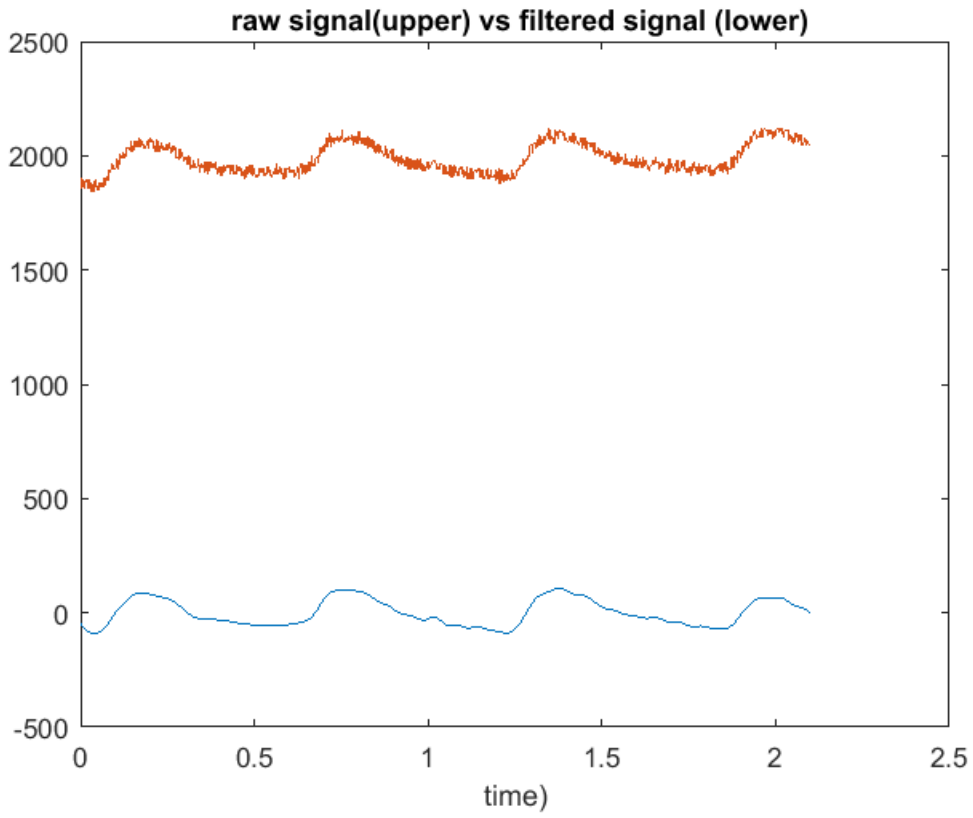
```
[A,B,C,D] = cheby2(5,20,[1 20]/500);

[filter_SOS,g] = ss2sos(A,B,C,D);

x = filtfilt(filter_SOS,g,ppg);
```

for time anaylsis

```
plot(t(1:length(ppg)),x);
hold on;
plot(t(1:length(ppg)),ppg);
title(' raw signal(upper) vs filtered signal (lower)')
xlabel('time)');
figure;
```

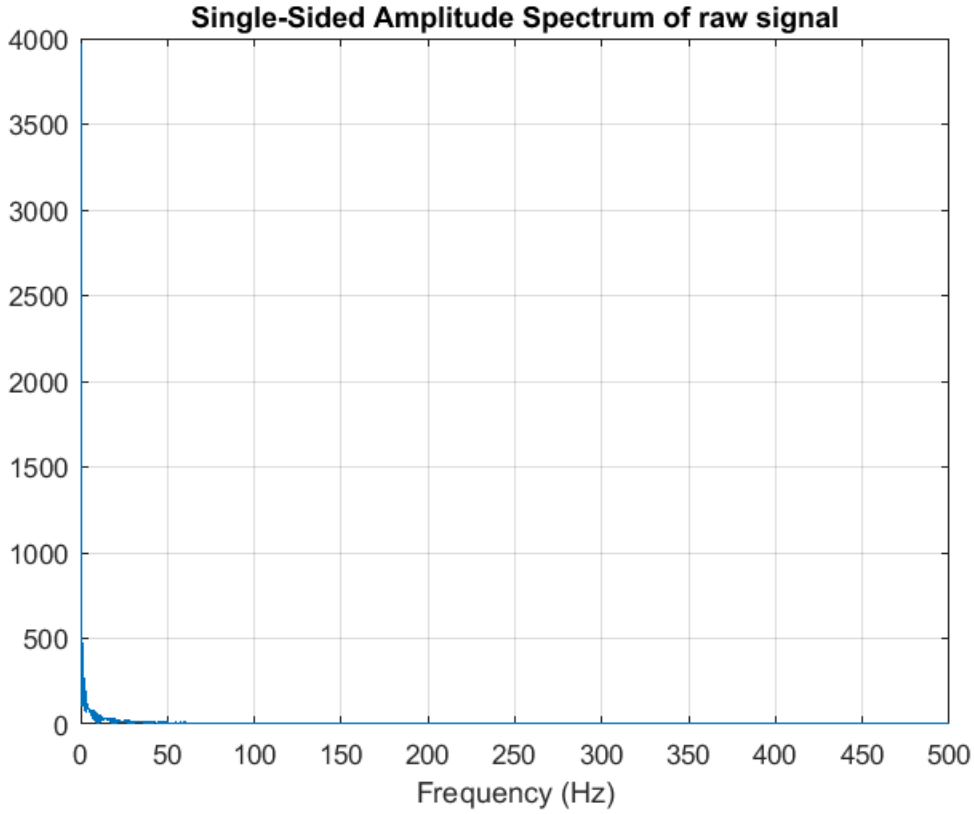


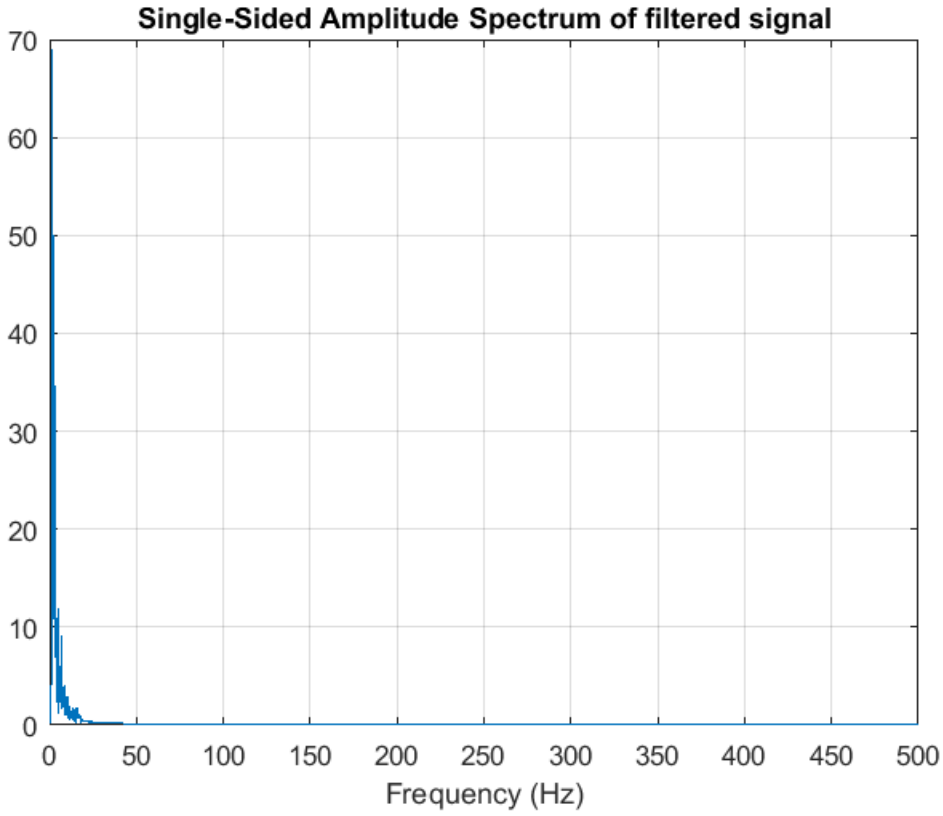
for frequencey anaylsis FFT of PPG signal

```
Fs=fs;
L=length(ppg);
NFFT = 2^nextpow2(L);% Next power of 2 from length of y
Y = fft(ppg,NFFT)/L;
f = Fs/2*linspace(0,1,NFFT/2+1);
% Plot single-sided amplitude spectrum.
plot(f,2*abs(Y(1:NFFT/2+1))),grid on
title('Single-Sided Amplitude Spectrum of raw signal')
xlabel('Frequency (Hz)')
figure;


Fs=fs;
L=length(x);
NFFT = 2^nextpow2(L);% Next power of 2 from length of y
Y = fft(x,NFFT)/L;
f = Fs/2*linspace(0,1,NFFT/2+1);
% Plot single-sided amplitude spectrum.

plot(f,2*abs(Y(1:NFFT/2+1))),grid on
title('Single-Sided Amplitude Spectrum of filtered signal')
xlabel('Frequency (Hz)')
```

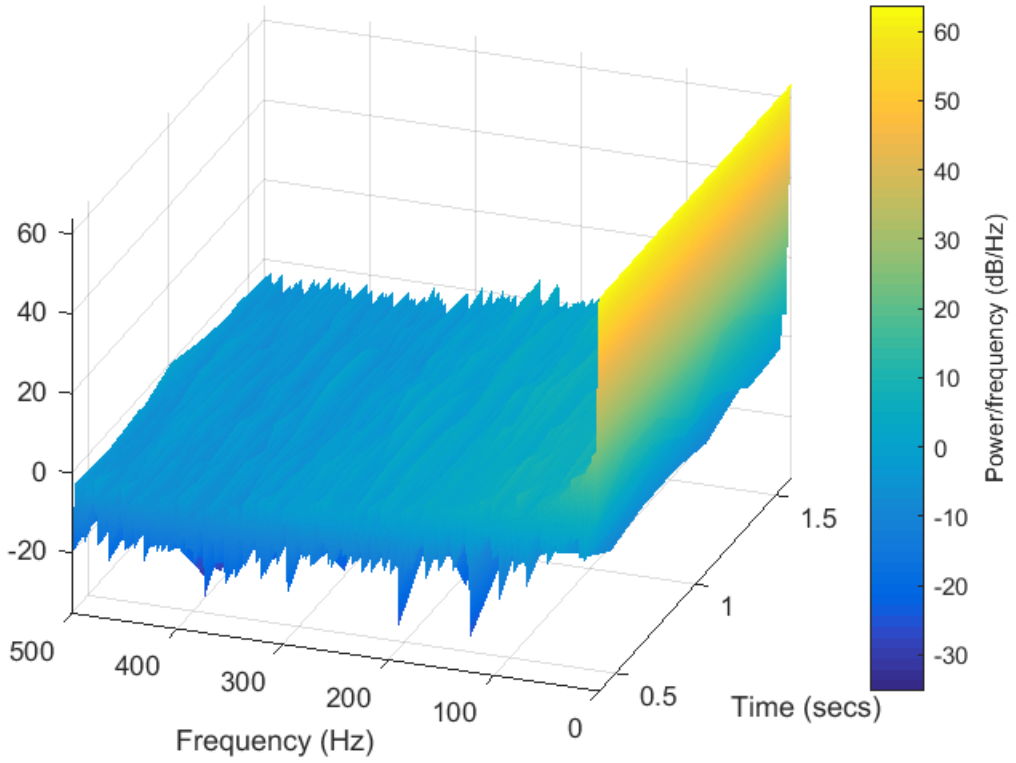

Single-Sided Amplitude Spectrum of raw signal
4000
3500
3000
2500
2000
1500
1000
500
0
0
50
100
150
200
250
300
350
400
450
500
Frequency (Hz)

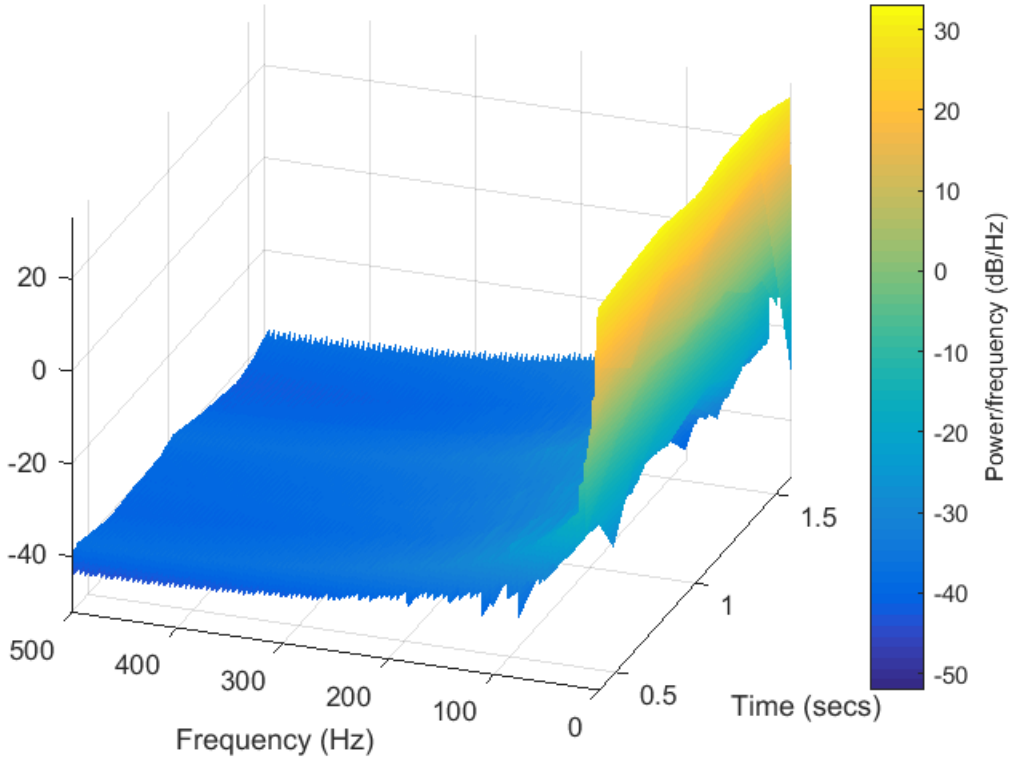

Single-Sided Amplitude Spectrum of filtered signal
70
60
50
40
30
20
10
0
0
50
100
150
200
250
300
350
400
450
500
Frequency (Hz)

for time vs frequencey spectrogram

```
figure;
spectrogram(ppg,800,600,1000,Fs,'yaxis');
view(-70,30);
shading interp;

figure;
spectrogram(x,800,600,1000,Fs,'yaxis');
view(-70,30);
shading interp;
```





Published with MATLAB® R2016a