EXPERIMENT 12

By,

Raja Aadhithan

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Write a MALTAB script for (frequency-domain parameters)
1. ECG/PPG peak detection
2. ECG/PPG feature extraction

CODE:

```
clc;
clear all;
clear;
fps=100;
vec=importdata('2.txt');
[X Y Z]=pca(vec);
sig = Y;
figure(1)
plot(sig)
title('Raw Data');
sig1 = sig - mean (sig ); % cancel DC conponents
sig1 = sig1/ max( abs(sig1 )); % normalize to one
% LPF (1-z^-6)^2/(1-z^-1)^2
b=[1 0 0 0 0 0 -2 0 0 0 0 0 1];
a=[1 -2 1];
h_LP=filter(b,a,[1 zeros(1,12)]); % transfer function of LPF
x2p = conv (sig1 ,h_LP);
%x2 = x2 (6+[1: N]); %cancel delay
x2p = x2p/ max( abs(x2p )); % normalize , for convenience .
figure(2);
plot(x2p);
title('Filtered Data');
nFrames=length(sig1); % Signal length
t = [0:nFrames-1]/fps;
[peaks, peak_pos,foots, foot_pos] = peakdetect(fps, nFrames, sig1);
peaks=peaks(2:end);
foots=foots(2:end);
peak_pos=peak_pos(2:end);
foot_pos=foot_pos(2:end);
npks=length(peak_pos);
figure(3)
plot(t,sig1, peak_pos/fps,peaks,'*r',foot_pos/fps,sig1(foot_pos),'*m')
title('Peak Detection');
time=length(sig1)/fps;
bpm=(npks/time)*60;
name= '2' ;
fps=100;
[psd,domFreq]=FreqDomainParameters( sig1, fps,name);
DATA1(1)=bpm;
DATA1(2)=psd;
DATA1(3)=domFreq(1);
dlmwrite('NEWD.txt',DATA1,'-append');
```

OUTPUT: