**EXPERIMENT 11**

By,

**Raja Aadhithan**

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**Write a MALTAB script for (time-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');

[pp,ff,fp,pf,ppbyff,ppbyfp,fpbyff,fpbypf,plht,crti,sarea,darea,totalarea,ratioarea,deti,AI,RI,npks]=timeDomainParameters(sig1,fps);

% else

% [pp,ff,fp,pf,ppbyff,ppbyfp,fpbyff,fpbypf,plht,crti,sarea,darea,totalarea,ratioarea,deti,AI,RI]=timeDomainParameters(SR(c(i):c(i)+124),fps);

%

% end

time=length(sig1)/fps;

bpm=(npks/time)\*60

name='2';

DATA1(1)=pp;

DATA1(2)=ff;

DATA1(3)=fp;

DATA1(4)=pf;

DATA1(5)=ppbyff;

DATA1(6)=ppbyfp;

DATA1(7)=fpbyff;

DATA1(8)=fpbypf;

DATA1(9)=plht;

DATA1(10)=crti;

DATA1(11)=bpm;

DATA1(12)=sarea;

DATA1(13)=darea;

DATA1(14)=totalarea;

DATA1(15)=ratioarea;

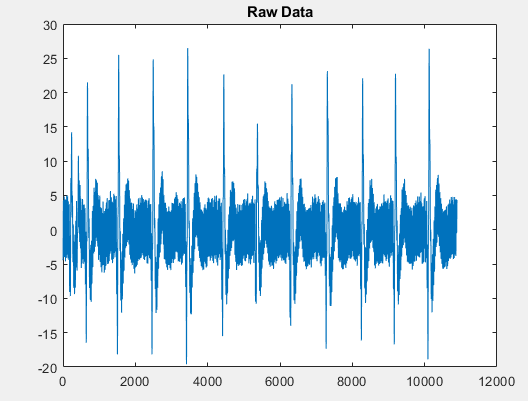
DATA1(16)=deti;

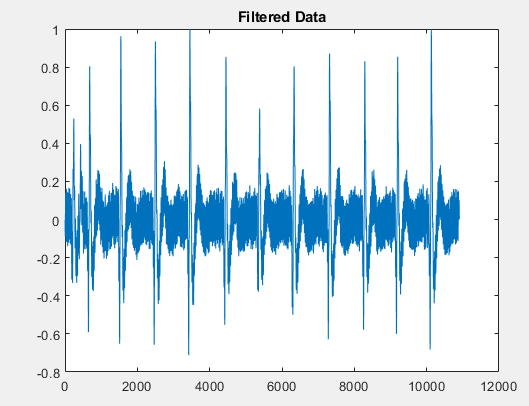
DATA1(17)=AI;

DATA1(18)=RI;

dlmwrite('NEWD.txt',DATA1,'-append')

**OUTPUT:**

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