Программа расчета динамики медианной частоты

function varargout = calc(varargin)

gui\_Singleton = 1;

gui\_State = struct('gui\_Name', mfilename, ...

'gui\_Singleton', gui\_Singleton, ...

'gui\_OpeningFcn', @calc\_OpeningFcn, ...

'gui\_OutputFcn', @calc\_OutputFcn, ...

'gui\_LayoutFcn', [] , ...

'gui\_Callback', []);

if nargin && ischar(varargin{1})

gui\_State.gui\_Callback = str2func(varargin{1});

end

if nargout

[varargout{1:nargout}] = gui\_mainfcn(gui\_State, varargin{:});

else

gui\_mainfcn(gui\_State, varargin{:});

end

function calc\_OpeningFcn(hObject, eventdata, handles, varargin)

handles.output = hObject;

guidata(hObject, handles);

global FS y\_temp t\_temp step

step=FS;

set(handles.edit4,'string',num2str(step/FS));

l=1;

i=1;

while i+step<=length(y\_temp)

[Pp,zp]=pwelch(y\_temp(i:i+step),[],[],[],FS);

TotalPp=sum(Pp);

HTotalPp=TotalPp/2;

CSPp=cumsum(Pp);

for j=2:length(CSPp)

if CSPp(j)>HTotalPp

k=j-1;

dMedF(l)=zp(k);

break

end

end

l=l+1;

i=i+round(step/2);

end

a=polyfit(1:length(dMedF),dMedF,1);

frate=a(1);

set(handles.edit13, 'String', frate);

set(handles.edit11, 'String', dMedF(1));

set(handles.edit12, 'String', dMedF(end));

t\_dMedF=(t\_temp(1):t\_temp(end)/(length(dMedF)-1):t\_temp(end));

axes(handles.axes3);

plot(t\_dMedF,dMedF);

xlabel('Время, сек')

ylabel('Частота, Гц')

title('Зависимость медианной частоты от времени')

function varargout = calc\_OutputFcn(hObject, eventdata, handles)

varargout{1} = handles.output;

function pushbutton1\_Callback(hObject, eventdata, handles)

global FS y\_temp t\_temp step

step=step-1000;

set(handles.edit4,'string',num2str(step/FS));

l=1;

i=1;

while i+step<=length(y\_temp)

[Pp,zp]=pwelch(y\_temp(i:i+step),[],[],[],FS);

TotalPp=sum(Pp);

HTotalPp=TotalPp/2;

CSPp=cumsum(Pp);

for j=2:length(CSPp)

if CSPp(j)>HTotalPp

k=j-1;

dMedF(l)=zp(k);

break

end

end

l=l+1;

i=i+round(step/2);

end

a=polyfit(1:length(dMedF),dMedF,1);

frate=a(1);

set(handles.edit13, 'String', frate);

set(handles.edit11, 'String', dMedF(1));

set(handles.edit12, 'String', dMedF(end));

t\_dMedF=(t\_temp(1):t\_temp(end)/(length(dMedF)-1):t\_temp(end));

axes(handles.axes3);

cla

plot(t\_dMedF,dMedF);

xlabel('Время, сек')

ylabel('Частота, Гц')

title('Зависимость медианной частоты от времени')

function pushbutton2\_Callback(hObject, eventdata, handles)

global FS y\_temp t\_temp step

step=step+1000;

set(handles.edit4,'string',num2str(step/FS));

l=1;

i=1;

while i+step<=length(y\_temp)

[Pp,zp]=pwelch(y\_temp(i:i+step),[],[],[],FS);

TotalPp=sum(Pp);

HTotalPp=TotalPp/2;

CSPp=cumsum(Pp);

for j=2:length(CSPp)

if CSPp(j)>HTotalPp

k=j-1;

dMedF(l)=zp(k);

break

end

end

l=l+1;

i=i+round(step/2);

end

a=polyfit(1:length(dMedF),dMedF,1);

frate=a(1);

set(handles.edit13, 'String', frate);

set(handles.edit11, 'String', dMedF(1));

set(handles.edit12, 'String', dMedF(end));

t\_dMedF=(t\_temp(1):t\_temp(end)/(length(dMedF)-1):t\_temp(end));

axes(handles.axes3);

cla

plot(t\_dMedF,dMedF);

xlabel('Время, сек')

ylabel('Частота, Гц')

title('Зависимость медианной частоты от времени')

function edit4\_Callback(hObject, eventdata, handles)

global FS y\_temp t\_temp step

step=FS\*(str2num(get(handles.edit4,'string')));

l=1;

i=1;

while i+step<=length(y\_temp)

[Pp,zp]=pwelch(y\_temp(i:i+step),[],[],[],FS);

TotalPp=sum(Pp);

HTotalPp=TotalPp/2;

CSPp=cumsum(Pp);

for j=2:length(CSPp)

if CSPp(j)>HTotalPp

k=j-1;

dMedF(l)=zp(k);

break

end

end

l=l+1;

i=i+round(step/2);

end

a=polyfit(1:length(dMedF),dMedF,1);

frate=a(1);

set(handles.edit13, 'String', frate);

set(handles.edit11, 'String', dMedF(1));

set(handles.edit12, 'String', dMedF(end));

t\_dMedF=(t\_temp(1):t\_temp(end)/(length(dMedF)-1):t\_temp(end));

axes(handles.axes3);

cla

plot(t\_dMedF,dMedF);

xlabel('Время, сек')

ylabel('Частота, Гц')

title('Зависимость медианной частоты от времени')

Главное окно

function varargout = main\_ru(varargin)

gui\_Singleton = 1;

gui\_State = struct('gui\_Name', mfilename, ...

'gui\_Singleton', gui\_Singleton, ...

'gui\_OpeningFcn', @main\_ru\_OpeningFcn, ...

'gui\_OutputFcn', @main\_ru\_OutputFcn, ...

'gui\_LayoutFcn', [] , ...

'gui\_Callback', []);

if nargin && ischar(varargin{1})

gui\_State.gui\_Callback = str2func(varargin{1});

end

if nargout

[varargout{1:nargout}] = gui\_mainfcn(gui\_State, varargin{:});

else

gui\_mainfcn(gui\_State, varargin{:});

end

function main\_ru\_OpeningFcn(hObject, eventdata, handles, varargin)

handles.output = hObject;

guidata(hObject, handles);

function varargout = main\_ru\_OutputFcn(hObject, eventdata, handles)

varargout{1} = handles.output;

function uipushtool1\_ClickedCallback(hObject, eventdata, handles)

global Y t TotalP MeanP MedF MeanF PeakF settings lastdir FS y\_temp t\_temp my\_choice\_fin

set(handles.fullname, 'String', '--');

set(handles.edit1, 'String', '--');

set(handles.edit2, 'String', '--');

set(handles.edit3, 'String', '--');

set(handles.edit4, 'String', '--');

set(handles.edit5, 'String', '--');

axes(handles.axes1);

cla;

axes(handles.axes2);

cla;

clc;

fid = fopen('lastdir.ini','r');

lastdir=fscanf(fid,'%s');

fclose(fid);

path= uigetdir(lastdir, 'ќткрытие папки');

if ~ isequal(path, 0)

currentdir=path;

currentdir(end)=[];

fid = fopen('lastdir.ini','w');

fprintf(fid,'%s\r\n',currentdir);

fclose(fid);

end

list=dir(strcat(path,'\','\*.wav\*'));

for i=1:length(list)

set(handles.edit1, 'String', '--');

set(handles.edit2, 'String', '--');

set(handles.edit3, 'String', '--');

set(handles.edit4, 'String', '--');

set(handles.edit5, 'String', '--');

FullName=strcat(path,'\',list(i).name);

set(handles.fullname, 'String', FullName);

[Y t FS]=open\_file(FullName);

y\_temp=Y;

t\_temp=t;

[P z]=spm(y\_temp, FS);

[TotalP MeanP MedF MeanF PeakF]=parametrs(P,z);

axes(handles.axes1);

cla

plot(t\_temp,y\_temp);

ylabel('јмплитуда');

xlabel('¬рем¤, сек');

title('»сходный сигнал миограммы');

axes(handles.axes2);

cla

plot(z,P,'red');

axis([0.2 500 0 1]);

ylabel('јмплитуда');

xlabel('„астота, √ц');

title('—ѕћ');

set(handles.edit5, 'String', TotalP)

set(handles.edit4, 'String', MeanP)

set(handles.edit1, 'String', MedF)

set(handles.edit2, 'String', MeanF)

set(handles.edit3, 'String', PeakF)

if settings(1,1)==1

if exist(strcat(add\_to\_base, '.fig'))

openfig(add\_to\_base, 'reuse')

end

uiwait(add\_to\_base);

elseif settings(1,1)==2

if exist(strcat(add\_to\_base\_sitenko, '.fig'))

openfig(add\_to\_base\_sitenko, 'reuse')

end

uiwait(add\_to\_base\_sitenko);

end

end

function uipushtool7\_ClickedCallback(hObject, eventdata, handles)

if exist(strcat(calc, '.fig'))

openfig(calc, 'reuse')

end

function uipushtool10\_ClickedCallback(hObject, eventdata, handles)

close(main\_ru)

if exist(strcat(launc, '.fig'))

openfig(launc, 'reuse')

end

function uipushtool2\_ClickedCallback(hObject, eventdata, handles)

global settings TotalP MeanP MedF MeanF PeakF

if settings(1,1)==1

if exist(strcat(add\_to\_base, '.fig'))

openfig(add\_to\_base, 'reuse')

end

uiwait(add\_to\_base);

elseif settings(1,1)==2

if exist(strcat(add\_to\_base\_sitenko, '.fig'))

openfig(add\_to\_base\_sitenko, 'reuse')

end

uiwait(add\_to\_base\_sitenko);

end

function uipushtool8\_ClickedCallback(hObject, eventdata, handles)

global t\_temp y\_temp FS y\_resize t\_resize TotalP MeanP MedF MeanF PeakF

if exist(strcat(resize, '.fig'))

openfig(resize, 'reuse')

end

uiwait(resize);

[P z]=spm(y\_resize, FS);

[TotalP MeanP MedF MeanF PeakF]=parametrs(P,z);

axes(handles.axes1);

cla

plot(t\_resize,y\_resize);

ylabel('јмплитуда');

xlabel('¬рем¤, сек');

title('»сходный сигнал миограммы');

axes(handles.axes2);

cla

plot(z,P,'red');

axis([0.2 500 0 1]);

ylabel('јмплитуда');

xlabel('„астота, √ц');

title('—ѕћ');

set(handles.edit5, 'String', TotalP)

set(handles.edit4, 'String', MeanP)

set(handles.edit1, 'String', MedF)

set(handles.edit2, 'String', MeanF)

set(handles.edit3, 'String', PeakF)

function uipushtool9\_ClickedCallback(hObject, eventdata, handles)

global t\_temp P my\_choice\_fin FS y\_temp Y t TotalP MeanP MedF MeanF PeakF

set(handles.fullname, 'String', '--');

set(handles.edit1, 'String', '--');

set(handles.edit2, 'String', '--');

set(handles.edit3, 'String', '--');

set(handles.edit4, 'String', '--');

set(handles.edit5, 'String', '--');

axes(handles.axes1);

cla;

axes(handles.axes2);

cla;

clc;

Filter={'\*.wav', '‘айл ≈ћ√ (\*.wav)'};

fid = fopen('lastdir.ini','r');

lastdir=fscanf(fid,'%s');

fclose(fid);

[FName, PName] = uigetfile(Filter, 'ќткрытие файла ≈ћ√',lastdir);

if ~ isequal(FName, 0)

FullName = strcat(PName, FName);

currentdir=PName;

currentdir(end)=[];

fid = fopen('lastdir.ini','w');

fprintf(fid,'%s\r\n',currentdir);

fclose(fid);

end

set(handles.fullname, 'String', FullName);

[Y t FS]=open\_file(FullName);

y\_temp=Y;

t\_temp=t;

[P z]=spm(y\_temp, FS);

[TotalP MeanP MedF MeanF PeakF]=parametrs(P,z);

axes(handles.axes1);

plot(t\_temp,y\_temp);

ylabel('јмплитуда');

xlabel('¬рем¤, сек');

title('»сходный сигнал миограммы');

axes(handles.axes2);

plot(z,P,'red');

axis([0.2 500 0 1]);

ylabel('јмплитуда');

xlabel('„астота, √ц');

title('—ѕћ');

set(handles.edit5, 'String', TotalP)

set(handles.edit4, 'String', MeanP)

set(handles.edit1, 'String', MedF)

set(handles.edit2, 'String', MeanF)

set(handles.edit3, 'String', PeakF)

Функция расчета СПМ

function [P z]=spm(y\_temp, FS)

P=[];

z=[];

[P,z]=pwelch(y\_temp,[],[],[],FS);

P=P./max(P);

Функция расчета спектральных показателей

function [TotalP MeanP MedF MeanF PeakF]=parametrs(P,z)

TotalP=[];

MeanP=[];

MedF=[];

MeanF=[];

PeakF=[];

TotalP=sum(P);

MeanP=mean(P);

CumSum=cumsum(P);

halfPower=TotalP/2;

for i=1:length(P)-1

if CumSum(i)>=halfPower

MedF=z(i-1);

break

end

end

MeanF=sum(z.\*P)/sum(P);

PeakF\_P=max(P);

for i=1:length(P)

if PeakF\_P==P(i)

PeakF=z(i);

end

end