LAMPIRAN A

LIST PROGRAM PADA MATLAB

1. Program Pembentukan Database Citra Referensi

```
clear;
close all;
clc;

KelasTotal=10;
GambarTotal=5;
Ekt='.jpg';
sample='-IMG-';
GdirAsal='D:\TA_NEW\Citra\Citra\Database\';
ListFitur=[];
for KelasKe=1:KelasTotal;
    for GambarKe=1:GambarTotal
        if KelasKe<10
            if GambarKe<10
                NamaFile=['0' num2str(KelasKe) sample '0'
num2str(GambarKe)]
            else
                NamaFile=['0' num2str(KelasKe) sample
num2str(GambarKe)]
            end
        else
            if GambarKe<10
                NamaFile=[num2str(KelasKe) sample '0'
num2str(GambarKe)]
            else
                NamaFile=[num2str(KelasKe) sample
num2str(GambarKe)]
            end
        end
        NamaFile=[GdirAsal NamaFile Ekt];
        CitraLatih=imread(NamaFile);
        CitraLatih=imresize(CitraLatih,[320 240])
        CitraLatih=rgb2gray(CitraLatih);
        CitraLatih=im2double(CitraLatih);

        h=fspecial('gaussian',[3 3],0.5); %Gaussian Filter
        G_Latih=imfilter(CitraLatih,h);

        Histeq_Latih=histeq(G_Latih); %Histogram Equalization
        tetha = 7*pi/8; %phi
        f0 = 2;  %tetha
        sigma = 0.65*f0;
        filterSize = 8;

        G = zeros(filterSize);


        for i=(0:filterSize-1)/filterSize
            for j=(0:filterSize-1)/filterSize
                xprime= j*cos(tetha);
                yprime= i*sin(tetha);
                K = exp(2*pi*f0*sqrt(-1)*(xprime + yprime));
                G(round((i+1)*filterSize),round((j+1)*filterSize))
= (1/(2*3.14*sigma^2))*(exp(-0.5*(i^2+j^2)/(sigma^2)))*K;
```

```
end
        end
        conv_latih = conv2(Histeq_Latih,G);
        for j=1:7
            conv_latih(:,1)=[];
            conv_latih(1,:)=[];
        end
        [N1 N2]=size(conv_latih);
        B=[];
        for i=1:N1
            C=conv_latih(i,:);
            B=horzcat(B,C);
        end
        VektorFitur=B';

        VektorFitur=abs(VektorFitur);
        ListFitur=[ListFitur VektorFitur];
    end
end
ListFiturFinal=ListFitur;
save 'D:\TA_NEW\Citra\Citra\ListFiturFinal' ListFiturFinal;
```

2. Program GUI untuk Pengujian

```
function varargout = gaborfilter_v2(varargin)
% GABORFILTER_V2 MATLAB code for gaborfilter_v2.fig
%      GABORFILTER_V2, by itself, creates a new GABORFILTER_V2 or
raises the existing
%      singleton*.
%
%      H = GABORFILTER_V2 returns the handle to a new
GABORFILTER_V2 or the handle to
%      the existing singleton*.
%
%      GABORFILTER_V2('CALLBACK',hObject,eventData,handles,...)
calls the local
%      function named CALLBACK in GABORFILTER_V2.M with the given
input arguments.
%
%      GABORFILTER_V2('Property','Value',...) creates a new
GABORFILTER_V2 or raises the
%      existing singleton*.  Starting from the left, property
value pairs are
%      applied to the GUI before gaborfilter_v2_OpeningFcn gets
called.  An
%      unrecognized property name or invalid value makes property
application
%      stop.  All inputs are passed to gaborfilter_v2_OpeningFcn
via varargin.
%
%      *See GUI Options on GUIDE's Tools menu.  Choose "GUI allows
only one
%      instance to run (singleton)".
%
```

```
% See also: GUIDE, GUIDATA, GUIHANDLES

% Edit the above text to modify the response to help
gaborfilter_v2

% Last Modified by GUIDE v2.5 21-Aug-2013 20:11:24

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
                   'gui_Singleton',  gui_Singleton, ...
                   'gui_OpeningFcn', @gaborfilter_v2_OpeningFcn,
...
                   'gui_OutputFcn',  @gaborfilter_v2_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
% End initialization code - DO NOT EDIT


% --- Executes just before gaborfilter_v2 is made visible.
function gaborfilter_v2_OpeningFcn(hObject, eventdata, handles,
varargin)
% This function has no output args, see OutputFcn.
% hObject    handle to figure
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)
% varargin   command line arguments to gaborfilter_v2 (see
VARARGIN)

% Choose default command line output for gaborfilter_v2
handles.output = hObject;

% Update handles structure
guidata(hObject, handles);

% UIWAIT makes gaborfilter_v2 wait for user response (see
UIRESUME)
% uiwait(handles.figure1);


% --- Outputs from this function are returned to the command line.
function varargout = gaborfilter_v2_OutputFcn(hObject, eventdata,
handles)
% varargout  cell array for returning output args (see VARARGOUT);
```

```
% hObject    handle to figure
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Get default command line output from handles structure
varargout{1} = handles.output;


% --- Executes on button press in pushbutton1.
function pushbutton1_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton1 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)
n=get(handles.edit1,'String');
OrangKe=str2num(n);
m=get(handles.edit2,'String');
KelasUji=str2num(m);
o=get(handles.edit3,'String');
MemberUji=str2num(o);

GdirUji='D:\TA_NEW\Citra\Citra\Citra Uji\';
Ext='.jpg';
sampleuji='-IMG-';

if OrangKe>10
    acc=set(handles.edit4,'String','Orang yang diinput tidak ada
dalam database')
end

if KelasUji<10

                NamaFileUji=['0' num2str(KelasUji) sampleuji '0'
num2str(MemberUji)]

        else
                NamaFileUji=[num2str(KelasUji) sampleuji '0'
num2str(MemberUji)]
end

NamaFileUji=[GdirUji NamaFileUji Ext];
imagex=imread(NamaFileUji);
imagex=rgb2gray(imagex);
imagex=imresize(imagex,[320 240]);
imagex=im2double(imagex);
guidata(hObject, handles);
axes(handles.axes1);
imshow(imagex);
handles.img=imagex;
handles.orang=OrangKe;
handles.kelas=KelasUji;
guidata(hObject, handles);

% --- Executes on button press in pushbutton2.
function pushbutton2_Callback(hObject, eventdata, handles)
```

```
% hObject    handle to pushbutton2 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)
load ListFiturFinal.mat
CitraUji=handles.img;

%% Gaussian

h_uji=fspecial('gaussian',[3 3],0.5);
G_uji=imfilter(CitraUji,h_uji);

%% Histogram Equalization

Histeq_uji=histeq(G_uji);

tetha_latih = 7*pi/8;
f0_latih = 2;
sigma_latih = 0.65*f0_latih;
filterSize_latih = 8;

G = zeros(filterSize_latih);


for i=(0:filterSize_latih-1)/filterSize_latih
    for j=(0:filterSize_latih-1)/filterSize_latih
        xprime= j*cos(tetha_latih);
        yprime= i*sin(tetha_latih);
        K = exp(2*pi*f0_latih*sqrt(-1)*(xprime + yprime));

G(round((i+1)*filterSize_latih),round((j+1)*filterSize_latih)) =
(1/(2*3.14*sigma_latih^2))*(exp(-
0.5*(i^2+j^2)/(sigma_latih^2)))*K;
    end
end

conv_uji = conv2(Histeq_uji,G);
for i=1:7
    conv_uji(:,1)=[];
    conv_uji(1,:)=[];
end

[Na Nb]=size(conv_uji);
B1=[];
for i=1:Na
C1=conv_uji(i,:);
B1=horzcat(B1,C1);
end
VektorFiturUji=B1';
VektorFiturUji=abs(VektorFiturUji);
DatabaseOrangKe=handles.orang;
AmbilFitur=((DatabaseOrangKe-1)*5)+1;
x=1;
for i=AmbilFitur:AmbilFitur+4
    d(x)=sqrt(sum((ListFiturFinal(:,i)-VektorFiturUji).^2));
    x=x+1;
```

```
end
dmin=min(d);
if handles.orang==1
    threshold=5.027;
end
if handles.orang==2
    threshold=7.65;
end
if handles.orang==3
    threshold=4.803;
end
if handles.orang==4
    threshold=5.024;
end
if handles.orang==5
    threshold=5.573;
end
if handles.orang==6
    threshold=7.536;
end
if handles.orang==7
    threshold=5.049;
end
if handles.orang==8
    threshold=8.844;
end
if handles.orang==9
    threshold=5.045;
end
if handles.orang==10
    threshold=8.319;
end

if dmin>threshold
    set(handles.edit4,'String','Tolak');
else
    set(handles.edit4,'String','Cocok');
end
set(handles.edit5,'String',dmin);
guidata(hObject, handles);

function edit1_Callback(hObject, eventdata, handles)
% hObject    handle to edit1 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit1 as text
%        str2double(get(hObject,'String')) returns contents of
edit1 as a double


% --- Executes during object creation, after setting all
properties.
function edit1_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit1 (see GCBO)
% eventdata  reserved - to be defined in a future version of
```

```
MATLAB
% handles    empty - handles not created until after all
CreateFcns called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end



function edit2_Callback(hObject, eventdata, handles)
% hObject    handle to edit2 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit2 as text
%        str2double(get(hObject,'String')) returns contents of
edit2 as a double


% --- Executes during object creation, after setting all
properties.
function edit2_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit2 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    empty - handles not created until after all
CreateFcns called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end



function edit3_Callback(hObject, eventdata, handles)
% hObject    handle to edit3 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit3 as text
%        str2double(get(hObject,'String')) returns contents of
edit3 as a double


% --- Executes during object creation, after setting all
properties.
```

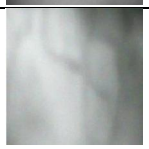
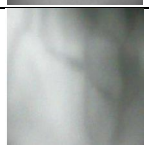
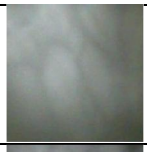
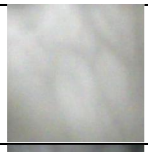
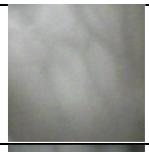
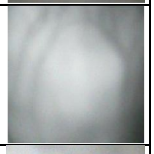
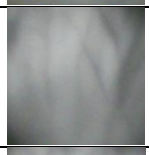
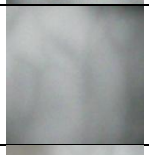
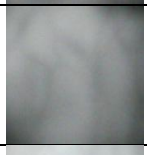
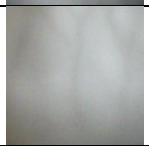
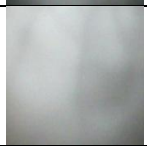
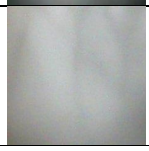
```
function edit3_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit3 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    empty - handles not created until after all
CreateFcns called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end



function edit4_Callback(hObject, eventdata, handles)
% hObject    handle to edit4 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit4 as text
%        str2double(get(hObject,'String')) returns contents of
edit4 as a double


% --- Executes during object creation, after setting all
properties.
function edit4_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit4 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    empty - handles not created until after all
CreateFcns called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end


% --- Executes on button press in pushbutton4.
function pushbutton4_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton4 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)
set(handles.edit1,'String','');
set(handles.edit2,'String','');
set(handles.edit3,'String','');
set(handles.edit4,'String','');
set(handles.edit5,'String','');
cla('reset');
```

```
guidata(hObject, handles);



function edit5_Callback(hObject, eventdata, handles)
% hObject    handle to edit5 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit5 as text
%        str2double(get(hObject,'String')) returns contents of
edit5 as a double


% --- Executes during object creation, after setting all
properties.
function edit5_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit5 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    empty - handles not created until after all
CreateFcns called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end


% --- Executes on button press in pushbutton5.
function pushbutton5_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton5 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)
fig=handles.figure1;
close(fig);
```

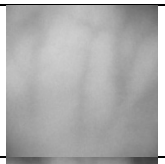
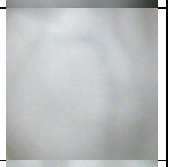
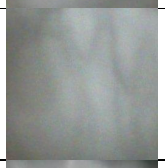
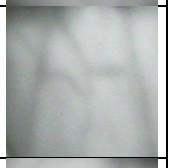
LAMPIRAN B

KUMPULAN CITRA

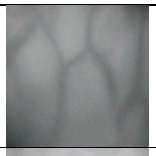
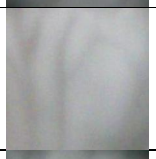
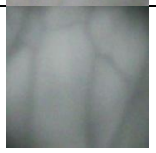
1. Citra Referensi

Citra Ke / Orang Ke	01	02	03	04	05
01					
02					
03					
04					
05					
06					
07					
08					
09					
10					

2. Citra uji dari individu yang ada dalam database

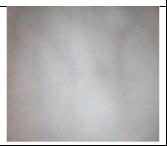
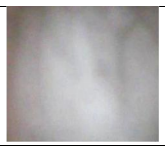
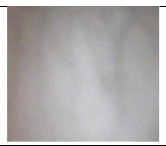
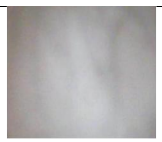
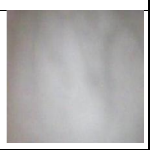
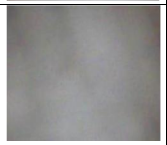
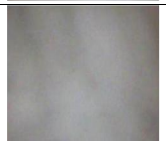
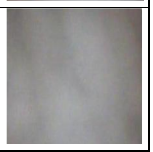
Citra Ke / Orang Ke	06	07	08
01			
02			
03			
04			
05			
06			
07			
08			
09			
10			

3. **Citra dari individu yang tidak ada dalam database**

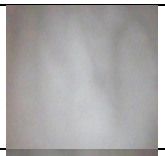
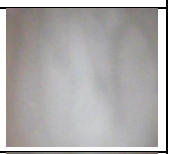
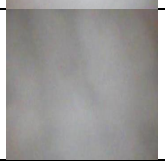
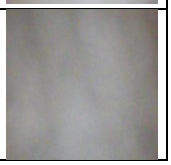
Citra Ke / Orang Ke	01
11	
12	
13	
14	
15	

4. **Citra orang kembar**

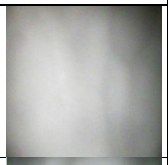
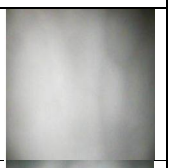
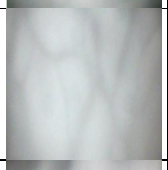
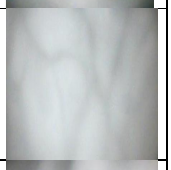
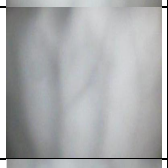
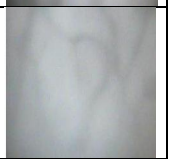
Citra database

Citra Ke / Orang Ke	01	02	03	04	05
16					
17					

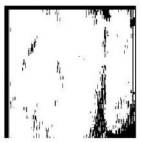
Citra uji

Orang Ke \ Citra Ke	06	07	08
16			
17			

5. Citra 2 kali diambil dengan keadaan diam

Orang Ke \ Citra Ke	01	02
18		
19		
20		
21		
22		

6. Kumpulan hasil citra filter gabor dengan θ yang berbeda-beda



$\theta = 0$

$\theta = \pi/8$

$\theta = 2\pi/8$

$\theta = 3\pi/8$

$\theta = 4\pi/8$

$\theta = 5\pi/8$

$\theta = 6\pi/8$

$\theta = 7\pi/8$

$\theta = \pi$