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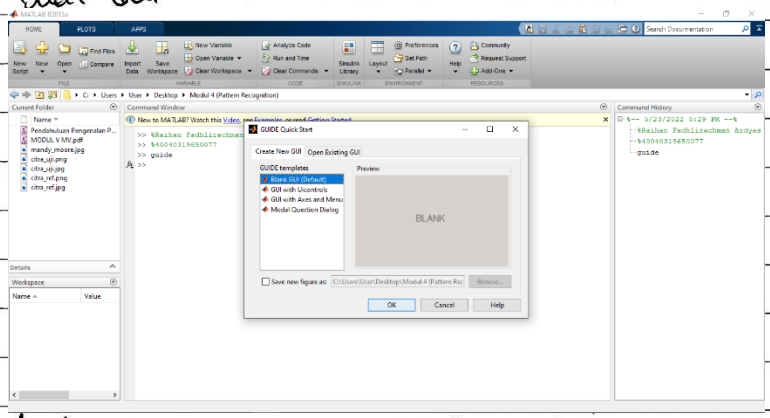
LAPORAN PRAKTIKUM
MACHINE VISION
MODUL - V

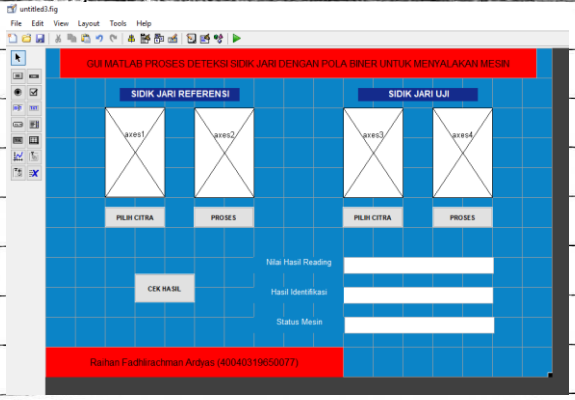
* Rancangan GUI Matlab untuk proses deteksi sidik jari menggunakan pola biner untuk menyalakan mesin.

a) Buat GUI



Analisis : Ketikan perintah "guide" untuk memunculkan tampilan seperti gambar diatas, lalu pilih blank GUI (defaut).

b) Desian Template



Analisis : Buat template untuk tampilan GUI seperti gambar diatas. Buat beberapa button untuk membuka file gambar, proses gambar menjadi citra BW menggunakan pola biner, dan button untuk menampilkan hasil citra yang akan menunjukan nilai hasil reading kecocokan citra referensi dan citra uji.

c.) Perintah yang digunakan untuk button pilih citra. yang kemudian ditampilkan pada kolom axes.

GUI_FingerPrint.m

```
73 -    varargout{1} = handles.output;
74
75
76      % --- Executes on button press in pushbutton1.
77      function pushbutton1_Callback(hObject, eventdata, handles)
78      % hObject    handle to pushbutton1 (see GCBO)
79      % eventdata  reserved - to be defined in a future version of MATLAB
80      % handles    structure with handles and user data (see GUIDATA)
81 -    [nama_file,nama_path] = uigetfile({'*.jpg';'*.bmp';'*.png';'*.tif';},...
82          'Buka Gambar');
83 -    if ~isequal (nama_file,0)
84 -        handles.I1 = imread(fullfile(nama_path,nama_file));
85 -        guidata(hObject,handles);
86 -        axes(handles.axes1);
87 -        imshow(handles.I1);
88 -    else
89 -        return
90 -    end
91
```

d.) Perintah yang digunakan untuk button proses yang akan mengubah citra gambar menjadi BW menggunakan pola biner.

GUI_FingerPrint.m

```
91
92
93      % --- Executes on button press in pushbutton2.
94      function pushbutton2_Callback(hObject, eventdata, handles)
95      % hObject    handle to pushbutton2 (see GCBO)
96      % eventdata  reserved - to be defined in a future version of MATLAB
97      % handles    structure with handles and user data (see GUIDATA)
98 -    I1 = handles.I1;
99 -    bw1 = im2bw(handles.I1,graythresh(handles.I1));
100 -   axes(handles.axes2);
101 -   imshow(bw1);
102 -   handles.data2 = bw1;
103
104
```

Analisis : perintah im2bw akan mengubah citra gambar yang dipilih menjadi hitam putih menggunakan pola biner yang menilai 0 sebagai hitam dan nilai 1 sebagai putih. kemudian citra yang telah diubah akan ditampilkan pada kolom axes

e.) Perintah yang digunakan untuk button cek hasil.

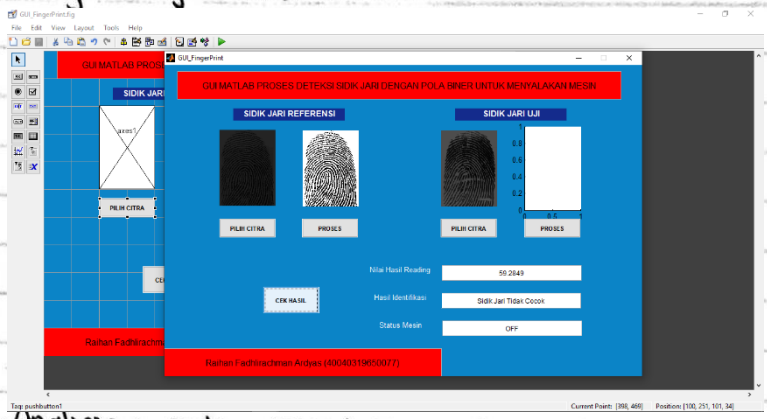
GUI_FingerPrint.m

```
133
134     % --- Executes on button press in pushbutton5.
135     function pushbutton5_Callback(hObject, eventdata, handles)
136     % hObject    handle to pushbutton5 (see GCBO)
137     % eventdata  reserved - to be defined in a future version of MATLAB
138     % handles    structure with handles and user data (see GUIDATA)
139 -   bw1 = im2bw(handles.I1,graythresh(handles.I1));
140 -   bw2 = im2bw(handles.I2,graythresh(handles.I2));
141 -   x=eq(bw1,bw2);
142 -   y=sum(x(:));
143 -   [m n] = size(handles.I1);
144 -   z = m*n;
145 -   persen = y/z*100;
146 -   set(handles.edit1,'String', persen);
147
148 -   if persen >= 75
149 -       set(handles.edit2, 'String', 'Sidik Jari Cocok');
150 -       set(handles.edit3, 'String', 'ON');
151 -   else
152 -       set(handles.edit2, 'String', 'Sidik Jari Tidak Cocok');
153 -       set(handles.edit3, 'String', 'OFF');
154 -   end
155
```

Analisis : Perintah yang digunakan akan memproses citra yang dipilih yang kemudian akan dihitung persentase kecocokan antara citra referensi dan citra uji. Jika hasil dari persentasi citra lebih besar atau sama dengan 75% maka akan menunjukan bahwa sidik jari cocok dan dapat digunakan untuk menyalakan mesin.

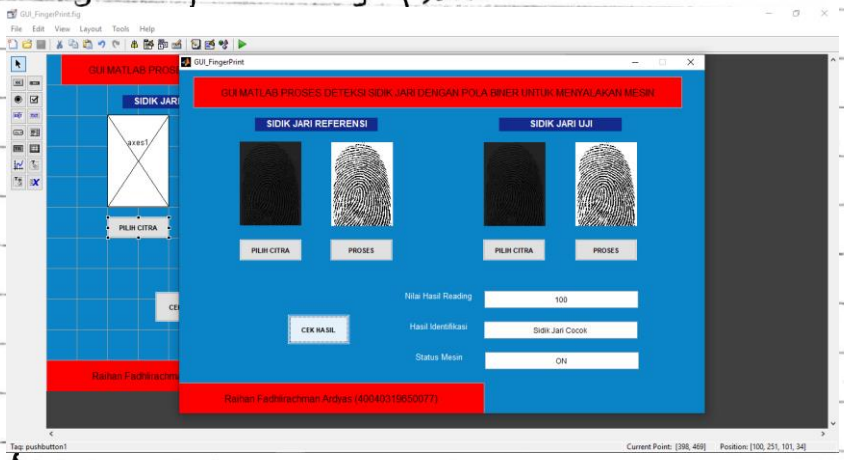
f.) Hasil percobaan penggunaan GUI Matlab proses sidik jari.

•) Dengan objek citra berbeda



Analisis : pada percobaan pertama saya menggunakan 2 citra yang berbeda. dan setelah di proses pada kolom hasil reading menunjukan nilai 59,2849 yang menunjukan bahwa citra yang digunakan untuk referensi dan citra yang digunakan sebagai uji tidak sama dan pada kolom hasil identifikasi akan menunjukan catatan bahwa "sidik jari tidak cocok" dan status mesin akan tetap OFF.

•) Dengan objek citra yang sama



Analisis : pada percobaan ini saya menggunakan 2 citra yang sama. Pada hasil setelah diproses karena menggunakan citra yang sama maka hasil reading menunjukan nilai 100 yang berarti bahwa citra yang digunakan sebagai referensi dan citra yang di uji sama, sehingga pada kolom hasil identifikasi akan menunjukan catatan "sidik jari cocok" dan status mesin akan berubah menjadi ON.

Lampiran Coding Yang digunakan:

```
function varargout = GUI_FingerPrint(varargin)
% GUI_FINGERPRINT MATLAB code for GUI_FingerPrint.fig
%      GUI_FINGERPRINT, by itself, creates a new GUI_FINGERPRINT or raises
the existing
%      singleton*.
%
%      H = GUI_FINGERPRINT returns the handle to a new GUI_FINGERPRINT or
the handle to
%      the existing singleton*.
%
%      GUI_FINGERPRINT('CALLBACK',hObject,eventData,handles,...) calls the
local
%      function named CALLBACK in GUI_FINGERPRINT.M with the given input
arguments.
%
%      GUI_FINGERPRINT('Property','Value',...) creates a new GUI_FINGERPRINT
or raises the
%      existing singleton*.  Starting from the left, property value pairs
are
%      applied to the GUI before GUI_FingerPrint_OpeningFcn gets called.  An
%      unrecognized property name or invalid value makes property
application
%      stop.  All inputs are passed to GUI_FingerPrint_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 GUI_FingerPrint

% Last Modified by GUIDE v2.5 23-May-2022 17:37:23

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
                   'gui_Singleton',  gui_Singleton, ...
                   'gui_OpeningFcn', @GUI_FingerPrint_OpeningFcn, ...
                   'gui_OutputFcn',  @GUI_FingerPrint_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 GUI_FingerPrint is made visible.
function GUI_FingerPrint_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 GUI_FingerPrint (see VARARGIN)

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

% Update handles structure
guidata(hObject, handles);

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


% --- Outputs from this function are returned to the command line.
function varargout = GUI_FingerPrint_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)
[nama_file,nama_path] = uigetfile({'*.jpg';'*.bmp';'*.png';'*.tif';},...
    'Buka Gambar');
if ~isequal (nama_file,0)
    handles.I1 = imread(fullfile(nama_path,nama_file));
    guidata(hObject,handles);
    axes(handles.axes1);
    imshow(handles.I1);
else
    return
end


% --- 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)
I1 = handles.I1;
bw1 = im2bw(handles.I1,graythresh(handles.I1));
```

```
axes(handles.axes2);
imshow(bw1);
handles.data2 = bw1;


% --- Executes on button press in pushbutton3.
function pushbutton3_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton3 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
[nama_file,nama_path] = uigetfile({'*.jpg';'*.bmp';'*.png';'*.tif';},...
    'Buka Gambar');
if ~isequal (nama_file,0)
    handles.I2 = imread(fullfile(nama_path,nama_file));
    guidata(hObject,handles);
    axes(handles.axes3);
    imshow(handles.I2);
else
    return
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)
I2 = handles.I2;
bw2 = im2bw(handles.I2,graythresh(handles.I2));
axes(handles.axes4);
imshow(bw2);
handles.data2 = bw2;


% --- 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)
bw1 = im2bw(handles.I1,graythresh(handles.I1));
bw2 = im2bw(handles.I2,graythresh(handles.I2));
x=eq(bw1,bw2);
y=sum(x(:));
[m n] = size(handles.I1);
z = m*n;
persen = y/z*100;
set(handles.edit1,'String', persen);

if persen >= 75
    set(handles.edit2, 'String', 'Sidik Jari Cocok');
    set(handles.edit3, 'String', 'ON');
else
    set(handles.edit2, 'String', 'Sidik Jari Tidak Cocok');
    set(handles.edit3, 'String', 'OFF');
end
```

```
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
```