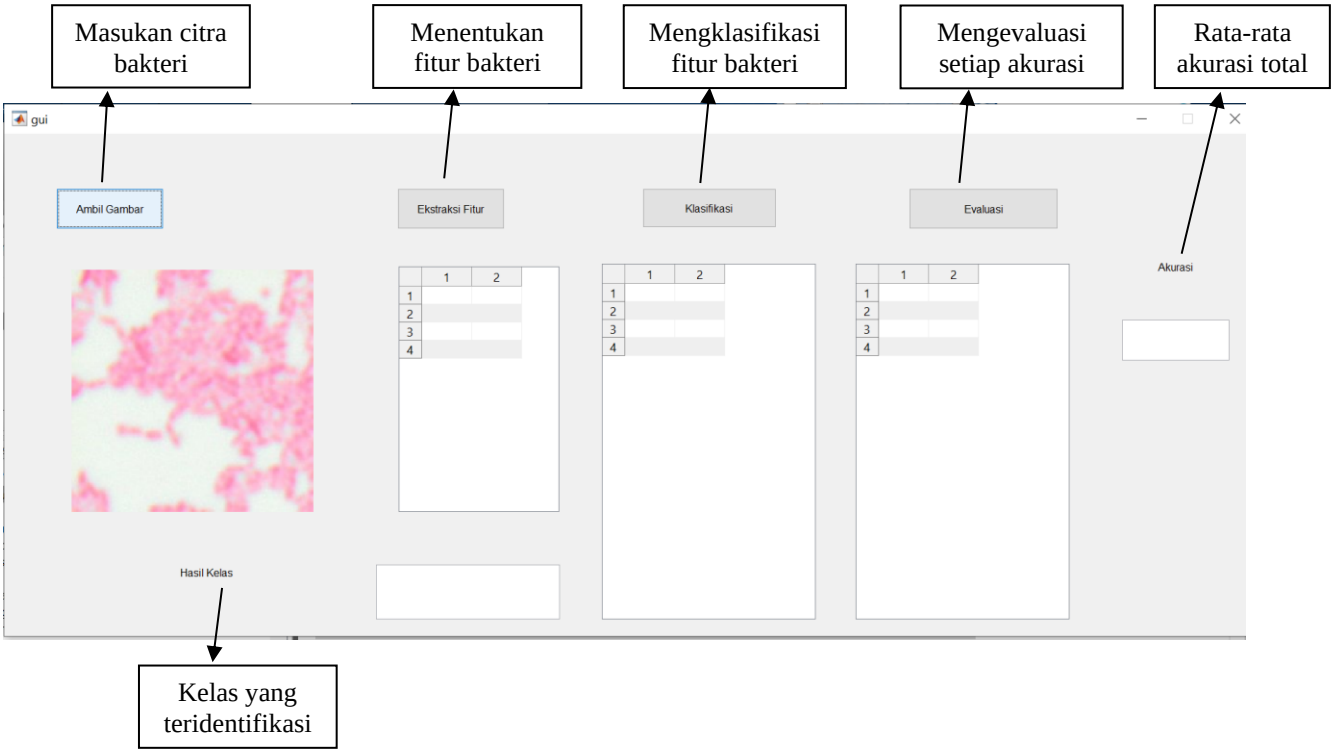
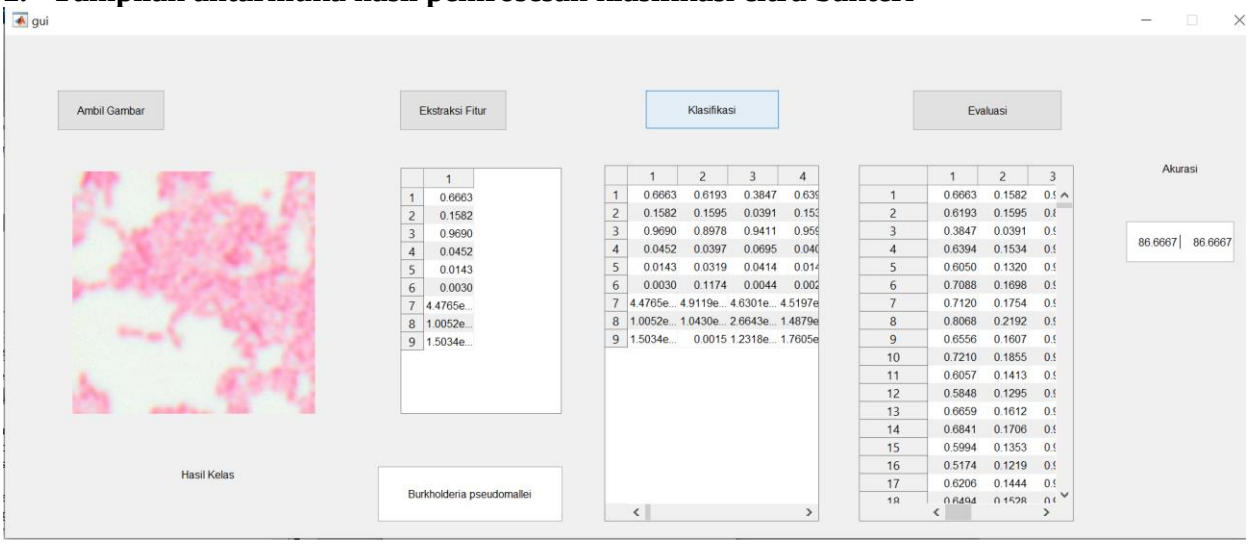
Aplikasi Klasifikasi Citra Bakteri Mikroskop Berbasis Perangkat Lunak GUI (*Graphical User Interface*)

1. Tampilan Antarmuka aplikasi



Pada tampilan antarmuka aplikasi terdiri dari bagian masukan data citra (ambil gambar), ekstrasi fitur, klasifikasi, evaluasi, hasil kelas dan akurasi. Masing-masing bagan akan menampilkan informasi data citra, data ekstrasi fitur, data klasifikasi, data evaluasi, hasil kelas data, dan luaran akurasi.

2. Tampilan antarmuka hasil pemrosesan klasifikasi citra bakteri



Tampilan antarmuka aplikasi ketika pemrosesan data telah dilakukan akan menunjukkan data-data setiap bagan sesuai dengan sintaks kode program.

Kode Program

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

% Last Modified by GUIDE v2.5 14-Apr-2022 14:06:58

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

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

% Update handles structure
guidata(hObject, handles);

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

```
% --- Outputs from this function are returned to the command line.
function varargout = gui_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)
[filename path] = uigetfile({'*.jpg';}, 'Buka Gambar');
if isequal(filename,0)
    return;
end
%im_input = imread(filename);
str=strcat(path,filename);

% menampilkan citra asli
eval('im_input=imread(str);')
axes(handles.axes1);
imshow(im_input);

handles.Img=im_input;

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)
image=handles.image;

   image=rgb2hsv(Img);
    RH= mean (mean(image(:,:,1)));
    RS= mean (mean(image(:,:,2)));
    RV= mean (mean(image(:,:,3)));
    SH= std(std(double(image(:,:,1))));
    SS= std(std(double(image(:,:,2))));
    SV= std(std(double(image(:,:,3))));
    VH= var(var(double(image(:,:,1))));
    VS= var(var(double(image(:,:,2))));
    VV= var(var(double(image(:,:,3))));

    fitur=[RH;RS;RV;SH;SS;SV;VH;VS;VV];

    set(handles.uitable1,'Data',fitur);
    handles.fitur=fitur;
    guidata(hObject, handles);

% --- 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)
xtrain=xlsread('fitur_latih123.xls','A1:D44984');
xtrain=xtrain';
kelas=xlsread('fitur_latih123.xls','H1:M44984');
kelas=kelas';
set(handles.uitable2,'Data',xtrain);
xtes=handles.fitur;
```

```
net=feedforwardnet(8,'trainscg');
net.trainParam.epochs=5000;
net.trainParam.goal=1e-5;
net.trainParam.lr=0.2;
net.trainParam.lr_inc=1.04;
net.trainParam.lr_dec=0.6;net.trainParam.mc=0.9;
net.trainParam.show=500;
net=train(net,xtrain,kelas);
hasil=sim(net,xtes);
if((hasil(1)>=0.5) && (hasil(2)<0.5) && (hasil(3)<0.5) && (hasil(4)<0.5) &&
(hasil(5)<0.5) && (hasil(6)<0.5))
    output="Burkholderia pseudomallei";
else
    if((hasil(1)<0.5) && (hasil(2)>=0.5) && (hasil(3)<0.5) &&
(hasil(4)<0.5) && (hasil(5)<0.5) && (hasil(6)<0.5))
        output="Hemophilus influenzae";
    else
        if((hasil(1)<0.5) && (hasil(2)<0.5) && (hasil(3)>=0.5) &&
(hasil(4)<0.5) && (hasil(5)<0.5) && (hasil(6)<0.5))
            output="Klebsiella Pneumoniae";
        else
            if((hasil(1)<0.5) && (hasil(2)<0.5) && (hasil(3)<0.5) &&
(hasil(4)>=0.5) && (hasil(5)<0.5) && (hasil(6)<0.5))
                output="Pseudomonas aeruginosa";
            else
                if((hasil(1)<0.5) && (hasil(2)<0.5) && (hasil(3)<0.5) &&
(hasil(4)<0.5) && (hasil(5)>=0.5) && (hasil(6)<0.5))
                    output="Staphylococcus aureus";
                else
                    if((hasil(1)<0.5) && (hasil(2)<0.5) && (hasil(3)<0.5)
&& (hasil(4)<0.5) && (hasil(5)<0.5) && (hasil(6)>=0.5))
                        output="Streptococcus pneumoniae";
                    else
                        output="No";
                    end
                end
            end
        end
    end
end
        set(handles.edit1,'String',output);
        handles.net=net;
        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
```

```
% --- 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)
xtes=xlsread('fitur_uji123.xls','A1:D13500');
set(handles.uitable3,'Data',xtes);
net=handles.net;
hasil=sim(net,xtes');
hasil=hasil';
[m n]=size(hasil);
for i=1:m
    if((hasil(i,1)>=0.5) && (hasil(i,2)<0.5) && (hasil(i,3)<0.5) &&
(hasil(i,4)<0.5) && (hasil(i,5)<0.5) && (hasil(i,6)<0.5))
    output(i)=1;
else
    if((hasil(i,1)<0.5) && (hasil(i,2)>=0.5) && (hasil(i,3)<0.5) &&
(hasil(i,4)<0.5) && (hasil(i,5)<0.5) && (hasil(i,6)<0.5))
        output(i)=2;
    else
        if((hasil(i,1)<0.5) && (hasil(i,2)<0.5) && (hasil(i,3)>=0.5) &&
(hasil(i,4)<0.5) && (hasil(i,5)<0.5) && (hasil(i,6)<0.5))
            output(i)=3;
        else
            if((hasil(i,1)<0.5) && (hasil(i,2)<0.5) && (hasil(i,3)<0.5) &&
(hasil(i,4)>=0.5) && (hasil(i,5)<0.5) && (hasil(i,6)<0.5))
                output(i)=4;
            else
                if((hasil(i,1)<0.5) && (hasil(i,2)<0.5) && (hasil(i,3)<0.5)
&& (hasil(i,4)<0.5) && (hasil(i,5)>=0.5) && (hasil(i,6)<0.5))
                    output(i)=5;
                else
                    if((hasil(i,1)<0.5) && (hasil(i,2)<0.5) &&
(hasil(i,3)<0.5) && (hasil(i,4)<0.5) && (hasil(i,5)<0.5) &&
(hasil(i,6)>=0.5))
                        output(i)=6;
                    else
                        output(i)=0;
                    end
                end
            end
        end
    end
end
end
yaktual=xlsread('fitur_uji123.xls','F1:F13500');
akurasi=sum(yaktual==output)/numel(yaktual);
set(handles.edit2,'String',num2str(akurasi));

guidata(hObject, handles);

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
```