DAFTRA PUSTAKA

Harefa, A., & Kristianto Hondro, R. (2024). Analisis Penggunaan Kohonen Method Pada Sistem Clasifikasi Segmentasi Citra. *KETIK : Jurnal Informatika*, *1*(03), 17–29.

Jamiilah, M., Utaminingrum, F., & Kurniawan, W. (2019). *Deteksi Gerakan Kepala Berdasarkan Analisis Bounding Box Pada Citra Digital Berbasis Raspberry Pi* (Vol. 3, Issue 2). http://j-ptiik.ub.ac.id

Jiwani, F. A., Satrio, B., Poetro, W., & Islam, U. (2025). SISTEM DETEKSI GAMBAR DEEPFAKE MENGGUNAKAN CNN DENSENET-121 DENGAN WATERMARKING LEAST SIGNIFICANT BIT (LSB). In *Jurnal Rekayasa Sistem Informasi dan Teknologi* (Vol. 2).

Kedokteran, J., & Kesehatan, D. (2015). *Identifikasi Individu dan Jenis Kelamin Berdasarkan Pola Sidik Bibir Indri Seta Septadina* (Vol. 2, Issue 2).

Mohamad Ali Murtadho, N. A. M. S. M. (2016). Implementasi Quick Response (Qr) Code Pada Aplikasi Validasi Dokumen Menggunakan Perancangan Unified Modelling Language (Uml). *Antivirus : Jurnal Ilmiah Teknik Informatika*, *10*(1), 42–50. https://doi.org/10.35457/antivirus.v10i1.87

Nugraha, K. A. (2024). Penerapan Optical Character Recognition untuk Pengenalan Variasi Teks pada Media Presentasi Pembelajaran 69. *Jurnal Buana Informatika*, 69–78.

Nur Nafi'iyah. (2015). *Algoritma Kohonen dalam Mengubah Citra Graylevel Menjadi Citra Biner*.

Nurhaliza, S. S., Subali, M., Etp, L., & Rozi, D. (2022). ANALISIS KINERJA OPTICAL CHARACTER RECOGNITION UNTUK MEMBACA DOKUMEN SECARA OTOMATIS. In *Seminar Nasional Teknologi Informasi dan Komunikasi STI&K (SeNTIK)* (Vol. 6, Issue 1).

Rifky Reyvansyah, M., Setiawan, E., Indarti, R., Munadhif Program Studi Teknik Otomasi, I., & Teknik Kelistrikan Kapal Politeknik Perkapalan Negeri Surabaya, J. (2022). Penerapan Metode Optical Character Recognition (OCR) Untuk Mengambil Data Arsip. In *Mochammad Rifky Reyvansyah* (Vol. 10, Issue 2). Edy Setiawan. https://journal.trunojoyo.ac.id/triac

Saptahadi, Y., & Setiawati, B. (2022). *EFEKTIVITAS PELAKSANAAN PELAYANAN PEMBUATAN SURAT IZIN MENGEMUDI (SIM) KELILING PADA SATUAN LALU LINTAS POLRES TABALONG*.

Setiawati, B., Suryani, L., Pembataan, J., Pudak, M., Tabalong, K., & Selatan, K. (2020). KUALITAS PELAYANAN PEMBUATAN SURAT IZIN MENGEMUDI (SIM) C DI POLRES HULU SUNGAI UTARA. In *JAPB* (Vol. 3).

Sonita, A., & Khairunnisyah. (2018). Aplikasi Pendeteksi Obat dan Makanan Menggunakan OCR (Optical Character Recognition). *Jurnal Informatika UPGRIS*, *4*(1), 111–116.

Sugeng, W., Utoro, R. K., & Prabowo, M. T. (2020). Identifikasi Plat Nomor Kendaraan Dengan Metode Optical Character Recognition Menggunakan Raspberry Pi. *Jurnal Informatika*, *7*(2), 116–125. https://doi.org/10.31294/ji.v7i2.7997

Syach, M. J. (2019). Sistem Pelayanan Publik Dalam Proses Pembuatan Surat Izin Mengemudi (SIM) Disusun Oleh : *Researchgate.Net*, *October*.

Yoga Budi Putranto, B., Hapsari, W., Wijana, K., & Kristen Duta Wacana Yogyakarta, U. (2010). *SEGMENTASI WARNA CITRA DENGAN DETEKSI WARNA HSV UNTUK MENDETEKSI OBJEK*.

L A M P I R A N

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

% Last Modified by GUIDE v2.5 20-Feb-2025 01:17:46

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
                   'gui_Singleton',  gui_Singleton, ...
                   'gui_OpeningFcn', @Home_OpeningFcn, ...
                   'gui_OutputFcn',  @Home_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 Home is made visible.
function Home_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 Home (see VARARGIN)
% Pilih gambar yang akan ditampilkan (ganti dengan nama file
gambar Anda)
    img = imread('UMB.jpg'); % Pastikan file gambar ada di
folder kerja MATLAB

    % Tampilkan gambar di axes1
    axes(handles.axes1);
    imshow(img);

    % Pilihan default output
    handles.output = hObject;

    % Simpan perubahan
    guidata(hObject, handles);
% Choose default command line output for Home
handles.output = hObject;

% Update handles structure
guidata(hObject, handles);


% --- Outputs from this function are returned to the command
line.
function varargout = Home_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;
```

```
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


% --- Executes on button press in pushbutton1.
function pushbutton1_Callback(hObject, eventdata, handles)
    % Ambil teks dari edit1 (Username) dan edit2 (Password)
    username = get(handles.edit1, 'String');
    password = get(handles.edit2, 'String');

    % Cek apakah username dan password kosong
    if isempty(username) || isempty(password)
        h = msgbox('Username dan Password harus diisi!',
'Peringatan', 'warn');
        uiwait(h); % Tunggu sampai pengguna menekan "OK"
        return; % Menghentikan eksekusi jika salah satu
kosong
    end

    % Tentukan username dan password yang valid
    validUsername = 'admin';
    validPassword = '12345';

    % Periksa apakah input cocok dengan username dan
password yang valid
    if strcmp(username, validUsername) && strcmp(password,
validPassword)
        h = msgbox('Login Berhasil!', 'Sukses', 'help');
        uiwait(h); % Tunggu sampai pengguna menekan "OK"

        % Jika pengguna menekan OK, lanjut ke slide
berikutnya
        guideocr; % Pastikan fungsi guideocr ada dalam
direktori yang benar
        close(Home); % Tutup halaman Home setelah login
sukses
    else
        h = msgbox('Username atau Password salah!', 'Error',
'error');
        uiwait(h); % Tunggu sampai pengguna menekan "OK"
```

```
    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)
button = questdlg('Ready to quit?','Exit
Dialog','Yes','No','No');
% Menampilkan kotak dialog konfirmasi
button = questdlg('Ready to quit?', 'Exit Dialog', 'Yes',
'No', 'No');

switch button
    case 'Yes'
        disp('Exiting MATLAB');
        close(gcf); % Menutup GUI yang sedang aktif
    case 'No'
        return; % Batalkan proses keluar tanpa error
```

PROCESSING.fig

```
function varargout = guideocr(varargin)
```

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

% Last Modified by GUIDE v2.5 20-Feb-2025 18:34:25

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

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

% Update handles structure
guidata(hObject, handles);

% UIWAIT makes guideocr wait for user response (see
UIRESUME)
% uiwait(handles.figure1);
% --- Output Function - Mengembalikan output GUI
function varargout = guideocr_OutputFcn(hObject, eventdata,
handles)
% hObject    handle to figure
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see
GUIDATA)
varargout{1} = handles.output;  % Mengembalikan nilai output
ke command line


% --- 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, pathname] = uigetfile({'*.jpg;*.png;*.bmp'},
'Pilih Gambar');
if isequal(filename,0)
```

```
    return;
end

handles.imgPath = fullfile(pathname, filename);
img = imread(handles.imgPath);

% Tampilkan gambar di axes1
axes(handles.axes1);
cla reset; % Reset axes untuk menghindari zoom
imshow(img);
axis normal; % Atur ulang axis ke normal (non-zoom)

% Tampilkan nama file di edit1
set(handles.edit1, 'String', filename);

% Dapatkan ukuran citra
[height, width, ~] = size(img);
imageSizeText = sprintf('%d x %d piksel', width, height);

% Tampilkan ukuran citra di edit6
set(handles.edit6, 'String', imageSizeText);

handles.img = img;
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)
% Reset tampilan GUI ke kondisi awal

% 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)

% Reset tampilan GUI ke kondisi awal

% Hapus gambar dari axes1, axes2, dan axes3
axes(handles.axes1);
cla reset; % Hapus semua konten di axes1 termasuk properti
zoom
axis off;

axes(handles.axes2);
cla reset;
axis off;

axes(handles.axes3);
cla reset;
axis off;

% Kosongkan edit1 (nama file)
set(handles.edit1, 'String', '');
% Kosongkan edit1 (nama file)
set(handles.edit6, 'String', '');
% Kosongkan listbox1 (hasil OCR)
set(handles.listbox1, 'String', {});

% Hapus data gambar dan hasil OCR dari handles
handles = rmfield(handles, {'img', 'imgPath', 'ocrText'});
```

```
% Matikan proses yang sedang berjalan (jika ada)
handles.pauseFlag = true;  % Hentikan semua proses yang
sedang berjalan

% Reset status radiobutton4
set(handles.radiobutton4, 'Value', 0);

% Update handles structure
guidata(hObject, handles);

msgbox('Tampilan telah direset!', 'Info', 'help');

% --- Executes on selection change in listbox1.
function listbox1_Callback(hObject, eventdata, handles)
% hObject    handle to listbox1 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see
GUIDATA)

% Hints: contents = cellstr(get(hObject,'String')) returns
listbox1 contents as cell array
%        contents{get(hObject,'Value')} returns selected
item from listbox1


% --- Executes during object creation, after setting all
properties.
function listbox1_CreateFcn(hObject, eventdata, handles)
% hObject    handle to listbox1 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    empty - handles not created until after all
CreateFcns called

% Hint: listbox 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 pushbutton10.
function pushbutton10_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton10 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see
GUIDATA)
```

```
button = questdlg('Ready to quit?','Exit
Dialog','Yes','No','No');
switch button
    case 'Yes',
        disp('Exiting MATLAB')
       %delete(handle.figure1);
      delete(gcf)
    case 'No',
        quit cancel;
        end


% --- Executes on button press in pushbutton11.
function pushbutton11_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton11 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see
GUIDATA)
 % --- Executes on button press in HOME.
    % Menutup halaman Home
    close(guideocr);
    % Membuka halaman Processing
    Home;



% --- Executes on button press in radiobutton4.
function radiobutton4_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton4 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see
GUIDATA)

if ~isfield(handles, 'img')
    msgbox('Silakan pilih gambar terlebih dahulu.', 'Error',
'error');
    return;
end

% Pastikan kita memulai proses OCR hanya jika tombol Refresh
belum ditekan
handles.pauseFlag = false;  % Set status flag menjadi false
(proses aktif)
guidata(hObject, handles);

img = handles.img;
grayImg = rgb2gray(img);
bwImg = imbinarize(grayImg);
bwImg = imcomplement(bwImg);
```

```
% Reset tampilan sebelum menggambar
axes(handles.axes1);
cla reset;
imshow(img);
axis normal;

axes(handles.axes2);
cla reset;
imshow(bwImg);
axis normal;
hold on;

validChars =
'ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456
789:/.';
ocrResults = ocr(bwImg, 'CharacterSet', validChars);
recognizedText = ocrResults.Text;

handles.ocrText = recognizedText;
guidata(hObject, handles);

bboxes = ocrResults.CharacterBoundingBoxes;
characters = ocrResults.Text;

axes(handles.axes3);
cla reset;
axis off;

pauseDuration = 0.05;

for i = 1:size(bboxes,1)
    handles = guidata(hObject);
    % Periksa apakah tombol Refresh sudah ditekan dan
pauseFlag bernilai true
    if handles.pauseFlag
        break;  % Hentikan proses jika Refresh ditekan
    end

    if contains(validChars, characters(i))
        axes(handles.axes2);
        hold on;

        bbox = bboxes(i,:) + [-5, -5, 10, 10];
        rectangle('Position', bbox, 'EdgeColor', 'G',
'LineWidth', 1);

        axes(handles.axes3);
        cla;
        text(0.5, 0.5, characters(i), 'Color', 'r',
'FontSize', 75, 'FontWeight', 'bold', ...
```

```
            'HorizontalAlignment', 'center',
'VerticalAlignment', 'middle');

        pause(pauseDuration);
    end
end

hold off;

% --- Executes on button press in radiobutton5.
function radiobutton5_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton5 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see
GUIDATA)

if isfield(handles, 'ocrText') && ~isempty(handles.ocrText)
    % Pisahkan hasil OCR per baris dan hilangkan whitespace
yang tidak perlu
    hasilOCR = strtrim(strsplit(handles.ocrText, '\n'));

    % Hanya masukkan teks yang tidak kosong ke dalam listbox
    hasilOCR = hasilOCR(~cellfun('isempty', hasilOCR));

    % Tampilkan hasil OCR di listbox1
    set(handles.listbox1, 'String', hasilOCR);
else
    msgbox('Hasil OCR belum diproses atau tidak tersedia!',
'Error', 'error');
end


% --- Executes on selection change in popupmenu3.
function popupmenu3_Callback(hObject, eventdata, handles)

% 1. Cropping Manual
% 2. Segmentasi Gambar
% 3. OCR dan Bounding Box

if ~isfield(handles, 'img')
    msgbox('Silakan pilih gambar terlebih dahulu.', 'Error',
'error');
    return;
end

% Dapatkan pilihan dari popup menu
popupSelection = get(hObject, 'Value');

% Pastikan kita memulai proses OCR hanya jika tombol Refresh
belum ditekan
```

```
handles.pauseFlag = false;  % Set status flag menjadi false
(proses aktif)
guidata(hObject, handles);

img = handles.img;

switch popupSelection
    case 1  % Cropping Manual
        axes(handles.axes1);
        cla reset;
        imshow(img);
        axis normal;

        % Tampilkan msgbox dengan uiwait untuk menunggu
pengguna klik "OK"
        h = msgbox('Silakan pilih area yang ingin di-crop
pada gambar.', 'Info', 'help');
        uiwait(h); % Tunggu pengguna menekan OK sebelum
lanjut

        % Setelah OK ditekan, lanjutkan cropping
        rect = getrect(handles.axes1); % Memilih area
cropping
        croppedImg = imcrop(img, rect); % Melakukan cropping

        axes(handles.axes2);
        cla reset;
        imshow(croppedImg); % Menampilkan hasil cropping
        axis normal;

        % Simpan hasil cropping ke handles agar bisa
digunakan di Case 2 & 3
        handles.croppedImg = croppedImg;
        guidata(hObject, handles);

    case 2  % Segmentasi Gambar
        % Gunakan hasil cropping jika ada, jika tidak
gunakan gambar asli
        if isfield(handles, 'croppedImg')
            imgToProcess = handles.croppedImg;
        else
            imgToProcess = img;
        end

        grayImg = rgb2gray(imgToProcess);
        bwImg = imbinarize(grayImg);
        bwImg = imcomplement(bwImg);

        axes(handles.axes2);
        cla reset;
        imshow(bwImg);
```

```
        axis normal;

        % Simpan hasil segmentasi ke handles agar bisa
digunakan di Case 3
        handles.segmentedImg = bwImg;
        guidata(hObject, handles);

    case 3  % OCR dan Bounding Box
        if isfield(handles, 'segmentedImg')
            bwImg = handles.segmentedImg;
        else
            if isfield(handles, 'croppedImg')
                imgToProcess = handles.croppedImg;
            else
                imgToProcess = img;
            end

            grayImg = rgb2gray(imgToProcess);
            bwImg = imbinarize(grayImg);
            bwImg = imcomplement(bwImg);

            % **Noise Removal**
            bwImg = bwareaopen(bwImg, 50);
            se = strel('rectangle', [2 2]);
            bwImg = imclose(bwImg, se);
        end

        axes(handles.axes2);
        cla reset;
        imshow(bwImg);
        axis normal;
        hold on;

        % **OCR dengan Konfigurasi lebih baik**
        validChars =
'ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456
789-:/.';
        ocrResults = ocr(bwImg, 'CharacterSet', validChars,
'TextLayout', 'Block');

        recognizedText = strtrim(ocrResults.Text);
        handles.ocrText = recognizedText;
        guidata(hObject, handles);

        % **Bounding Box Perbaikan**
        bboxes = ocrResults.CharacterBoundingBoxes;
        characters = ocrResults.Text;

        axes(handles.axes3);
        cla reset;
        axis off;
```

```
        pauseDuration = 0.05;

        for i = 1:size(bboxes,1)
            handles = guidata(hObject);

            if handles.pauseFlag
                break;
            end

            if contains(validChars, characters(i))
                axes(handles.axes2);
                hold on;

                bbox = bboxes(i,:) + [-5, -5, 10, 10];
                rectangle('Position', bbox, 'EdgeColor',
'G', 'LineWidth', 1 );

                axes(handles.axes3);
                cla;
                text(0.5, 0.5, characters(i), 'Color', 'r',
'FontSize', 75, 'FontWeight', 'bold', ...
                     'HorizontalAlignment', 'center',
'VerticalAlignment', 'middle');

                pause(pauseDuration);
            end
        end

        hold off;
end


% --- Executes during object creation, after setting all
properties.
function popupmenu3_CreateFcn(hObject, eventdata, handles)
% hObject    handle to popupmenu3 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    empty - handles not created until after all
CreateFcns called
```