function varargout = GUI(varargin)

%GUI MATLAB code file 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('Property','Value',...) creates a new GUI using the

% given property value pairs. Unrecognized properties are passed via

% varargin to GUI\_OpeningFcn. This calling syntax produces a

% warning when there is an existing singleton\*.

%

% GUI('CALLBACK') and GUI('CALLBACK',hObject,...) call the

% local function named CALLBACK in GUI.M with the given input

% arguments.

%

% \*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 13-Dec-2021 19:59:17

% 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, ~, 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 unrecognized PropertyName/PropertyValue pairs from the

% command line (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(~, ~, 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(~, ~, ~)

obj= videoinput('winvideo',2,'RGB24\_800x600'); %设备采集图像输入,适配器名称,图像格式

src = getselectedsource(obj);

src.ColorEnable = 'off';

src.Brightness = 30000;%

src.Gain = 100;%增益

src.Gamma = 50;%灰度

src.Saturation = 130;%饱和度

preview(obj);

% 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)

function pushbutton2\_Callback(~, ~, ~)

% --- Executes on button press in pushbutton2.

flag= imread('D:\123\1.jpg','jpg');

gray\_img = rgb2gray(flag);%灰度化处理

n=graythresh(gray\_img);%自动确定阈值

BW=im2bw(gray\_img,n);%二值化处理

imwrite(BW,'D:\123\2.jpg','jpg');

imshow(BW);

% 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)

% --- Executes on button press in pushbutton3.

function pushbutton3\_Callback(~, eventdata, handles)

flag = imread('D:\123\1.jpg','jpg');

flag\_hsv = rgb2hsv(flag); % 将图像的rgb色彩空间转化至hsv色彩空间

flag\_new = 255\*ones(size(flag));% 创建一个白色图像，将特定颜色提取到此处

flag\_new\_hsv = rgb2hsv(flag\_new);% 将该图像转至hsv色彩空间

color=['yellow','red','blue','green'];

for k = 1:length(color)

switch k

case 1

%提取红色部分

[row, col] = ind2sub(size(flag\_hsv),find((flag\_hsv(:,:,1)>0.00...

& flag\_hsv(:,:,1)< 0.08) |( flag\_hsv(:,:,1)>0.95 & flag\_hsv(:,:,1)<1)&flag\_hsv(:,:,2)>0.16 & flag\_hsv(:,:,3)>0.18));

% 将图像中的红色像素复制到刚才新建的白色图像中

for i = 1 : length(row)

flag\_new\_hsv(row(i),col(i),:) = flag\_hsv(row(i),col(i),:);

end

flag\_red = hsv2rgb(flag\_new\_hsv);% 将提取出来的红色，转化至rgb空间，进行展示

imshow(flag\_red);

end

end

% 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)

% --- Executes on button press in pushbutton4.

function pushbutton4\_Callback(hObject, eventdata, handles)

flag = imread('D:\123\1.jpg','jpg');

flag\_hsv = rgb2hsv(flag); % 将图像的rgb色彩空间转化至hsv色彩空间

flag\_new = 255\*ones(size(flag));% 创建一个白色图像，将特定颜色提取到此处

flag\_new\_hsv = rgb2hsv(flag\_new);% 将该图像转至hsv色彩空间

color=['yellow','red','blue','green'];

for k = 1:length(color)

switch k

case 2

%提取绿色部分

[row, col] = ind2sub(size(flag\_hsv),find(flag\_hsv(:,:,1)>0.18...

& flag\_hsv(:,:,1)< 0.48 & flag\_hsv(:,:,2)>0.16 & flag\_hsv(:,:,3)>0.18));

% 将图像中的绿色像素复制到刚才新建的白色图像中

for i = 1 : length(row)

flag\_new\_hsv(row(i),col(i),:) = flag\_hsv(row(i),col(i),:);

end

flag\_green = hsv2rgb(flag\_new\_hsv);% 将提取出来的绿色，转化至rgb空间，进行展示

imshow(flag\_green);

end

end

% 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)

% --- Executes on button press in pushbutton5.

function pushbutton5\_Callback(~, ~, ~)

flag = imread('D:\123\1.jpg','jpg');

flag\_hsv = rgb2hsv(flag); % 将图像的rgb色彩空间转化至hsv色彩空间

flag\_new = 255\*ones(size(flag));% 创建一个白色图像，将特定颜色提取到此处

flag\_new\_hsv = rgb2hsv(flag\_new);% 将该图像转至hsv色彩空间

color=['yellow','red','blue','green'];

for k = 1:length(color)

switch k

case 3

%提取黄色部分

[row, col] = ind2sub(size(flag\_hsv),find(flag\_hsv(:,:,1)>0.08...

& flag\_hsv(:,:,1)< 0.23 & flag\_hsv(:,:,2)>0.16 & flag\_hsv(:,:,3)>0.18));

% 将图像中的黄色像素复制到刚才新建的白色图像中

for i = 1 : length(row)

flag\_new\_hsv(row(i),col(i),:) = flag\_hsv(row(i),col(i),:);

end

flag\_yellow = hsv2rgb(flag\_new\_hsv);% 将提取出来的黄色，转化至rgb空间，进行展示

imshow(flag\_yellow);

end

end

% 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)

% --- Executes on button press in pushbutton6.

function pushbutton6\_Callback(~, eventdata, handles)

flag = imread('D:\123\1.jpg','jpg');

flag\_hsv = rgb2hsv(flag); % 将图像的rgb色彩空间转化至hsv色彩空间

flag\_new = 255\*ones(size(flag));% 创建一个白色图像，将特定颜色提取到此处

flag\_new\_hsv = rgb2hsv(flag\_new);% 将该图像转至hsv色彩空间

color=['yellow','red','blue','green'];

for k = 1:length(color)

switch k

case 4

%提取蓝色部分

[row, col] = ind2sub(size(flag\_hsv),find(flag\_hsv(:,:,1)>0.5...

& flag\_hsv(:,:,1)< 0.7 & flag\_hsv(:,:,2)>0.16 & flag\_hsv(:,:,3)>0.18));

% 将图像中的蓝色像素复制到刚才新建的白色图像中

for i = 1 : length(row)

flag\_new\_hsv(row(i),col(i),:) = flag\_hsv(row(i),col(i),:);

end

flag\_blue = hsv2rgb(flag\_new\_hsv);% 将提取出来的蓝色，转化至rgb空间，进行展示

imshow(flag\_blue);

end

end

% hObject handle to pushbutton6 (see GCBO)

% eventdata reserved - to be defined in a future version of MATLAB

% handles structure with handles and user data (see GUIDATA)

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

function axes1\_CreateFcn(hObject, eventdata, handles)

% hObject handle to axes1 (see GCBO)

% eventdata reserved - to be defined in a future version of MATLAB

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

% Hint: place code in OpeningFcn to populate axes1

% --- Executes on button press in togglebutton1.

function togglebutton1\_Callback(hObject, eventdata, handles)

axes(handles.axes1);

[filename,pathname]=uigetfile({'\*.bmp;\*.jpg;\*.png;\*.jpeg;\*.tif'});

str=[pathname filename];

flag = imread(str);

imshow(flag);

imwrite(flag,'D:\123\1.jpg','jpg');

% hObject handle to togglebutton1 (see GCBO)

% eventdata reserved - to be defined in a future version of MATLAB

% handles structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of togglebutton1

% --- Executes on button press in pushbutton8.

function pushbutton8\_Callback(hObject, eventdata, handles)

I=imread('D:\123\1.jpg','jpg');

S=strel('diamond',8);%建立一个8\*8的菱形结构元素

A1=imdilate(I,S);

A2=imdilate(A1,S);

A3=imdilate(A2,S);%膨胀三次

imshow(A3);

% hObject handle to pushbutton8 (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 pushbutton9.

function pushbutton9\_Callback(hObject, eventdata, handles)

% hObject handle to pushbutton9 (see GCBO)

% eventdata reserved - to be defined in a future version of MATLAB

% handles structure with handles and user data (see GUIDATA)

% --- Executes on selection change in popupmenu1.

function popupmenu1\_Callback(hObject, eventdata, handles)

% hObject handle to popupmenu1 (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 popupmenu1 contents as cell array

% contents{get(hObject,'Value')} returns selected item from popupmenu1

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

function popupmenu1\_CreateFcn(hObject, eventdata, handles)

% hObject handle to popupmenu1 (see GCBO)

% eventdata reserved - to be defined in a future version of MATLAB

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

% Hint: popupmenu 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 togglebutton3.

function togglebutton3\_Callback(hObject, eventdata, handles)

flag = imread('D:\123\1.jpg','jpg');

imshow(flag);

% hObject handle to togglebutton3 (see GCBO)

% eventdata reserved - to be defined in a future version of MATLAB

% handles structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of togglebutton3

% --- Executes on button press in togglebutton4.

function togglebutton4\_Callback(hObject, eventdata, handles)

obj= videoinput('winvideo',2,'RGB24\_800x600'); %设备采集图像输入,适配器名称,图像格式

src = getselectedsource(obj);

src.ColorEnable = 'off';

src.Brightness = 30000;%

src.Gain = 100;%增益

src.Gamma = 50;%灰度

src.Saturation = 130;%饱和度

pause(3);%延时函数，单位：秒

flag = getsnapshot(obj);

imshow(flag);%显示图片frame

imwrite(flag,'D:\123\1.jpg','jpg');

% hObject handle to togglebutton4 (see GCBO)

% eventdata reserved - to be defined in a future version of MATLAB

% handles structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of togglebutton4

% --- Executes on button press in pushbutton15.

function pushbutton15\_Callback(hObject, eventdata, handles)

flag= imread('D:\123\1.jpg','jpg');

gray\_img = rgb2gray(flag);%灰度化处理

n=graythresh(gray\_img);%自动确定阈值

BW=im2bw(gray\_img,n);%二值化处理

L=bwlabel(BW);

STATS=regionprops(L,'all');%选取所有连通区域

imshow(BW);

for i = 1:size(STATS, 1) %获取行数

boundary=STATS(i).BoundingBox;

rectangle('position',boundary, 'EdgeColor', 'r');%绘制连通区域矩形框

end

% hObject handle to pushbutton15 (see GCBO)

% eventdata reserved - to be defined in a future version of MATLAB

% handles structure with handles and user data (see GUIDATA)

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 pushbutton16.

function pushbutton16\_Callback(hObject, eventdata, handles)

BW = imread('D:\123\2.jpg','jpg');

bw1=imfill(BW,'holes');%填充

imshow(bw1);

% hObject handle to pushbutton16 (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 pushbutton17.

function pushbutton17\_Callback(hObject, eventdata, handles)

BW = imread('D:\123\2.jpg','jpg');

BW=1-BW;

bw2=imfill(BW,'holes');%填充

imshow(bw2);

% hObject handle to pushbutton17 (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 pushbutton18.

function pushbutton18\_Callback(hObject, eventdata, handles)

I=imread('D:\123\1.jpg','jpg');

S=strel('diamond',8);%建立一个8\*8的菱形结构元素

A1=imdilate(I,S);

A2=imdilate(A1,S);

A3=imdilate(A2,S);%膨胀三次

sel=strel('disk',8);%建立一个半径为8的圆盘结构

B1=imerode(A3,sel);

B2=imerode(B1,sel);

B3=imerode(B2,sel);%腐蚀三次

C1=imfill(B3,'holes');%填充

imshow(C1);

% hObject handle to pushbutton18 (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 pushbutton19.

function pushbutton19\_Callback(hObject, eventdata, handles)

I2=imread('D:\123\1.jpg','jpg');

sel=strel('disk',8);%建立一个半径为8的圆盘结构

B1=imerode(I2,sel);

B2=imerode(B1,sel);

B3=imerode(B2,sel);%腐蚀三次

imshow(B3);

% hObject handle to pushbutton19 (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 pushbutton20.

function pushbutton20\_Callback(hObject, eventdata, handles)

flag= imread('D:\123\1.jpg','jpg');

gray\_img = rgb2gray(flag);%灰度化处理

n=graythresh(gray\_img);%自动确定阈值

BW=im2bw(gray\_img,n);%二值化处理

BW=1-BW;%颜色反转

L=bwlabel(BW);

STATS=regionprops(L,'all');%选取所有连通区域

imshow(BW);

for i = 1:size(STATS, 1) %获取行数

boundary=STATS(i).BoundingBox;

rectangle('position',boundary, 'EdgeColor', 'r');%绘制连通区域矩形框

end

% hObject handle to pushbutton20 (see GCBO)

% eventdata reserved - to be defined in a future version of MATLAB

% handles structure with handles and user data (see GUIDATA)

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

function pushbutton19\_CreateFcn(hObject, eventdata, handles)

% hObject handle to pushbutton19 (see GCBO)

% eventdata reserved - to be defined in a future version of MATLAB

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

% --- Executes on button press in pushbutton21.

function pushbutton21\_Callback(hObject, eventdata, handles)

flag= imread('D:\123\1.jpg','jpg');

gray\_img = rgb2gray(flag);%灰度化处理

imshow(gray\_img);

% hObject handle to pushbutton21 (see GCBO)

% eventdata reserved - to be defined in a future version of MATLAB

% handles structure with handles and user data (see GUIDATA)