Appendix A

function varargout = power control(varargin)
% power control MATLAB code for power control.fig
% power control , by itself, creates a new LASTY or raises the
% existing singleton*.
% H = power control returns the handle to a new power control or the
% handle to the existing singleton*.

% power control('CALLBACK',hObject,eventData,handles,...) calls the
local function named CALLBACK in LASTY.M with the given input
arguments.
% power control('Property','Value',...) creates a new power control or
raises the existing singleton*. Starting from the left, property
value pairs are
% applied to the GUI before power control_OpeningFcn gets called. An
unrecognized property name or invalid value makes property application
stop. All inputs are passed to LASTY_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 power control

% Last Modified by GUIDE v2.5 31-Jan-2013 14:43:29
% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name', mfilename, ...
    'gui_Singleton', gui_Singleton, ...
    'gui_OpeningFcnc', @powercontrolOpeningFcnc, ...
    'gui_OutputFcnc', @powercontrol_OutputFcnc, ...
    'gui_LayoutFcnc', [], ...
    '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 LASTY is made visible.
function powercontrol_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 power control (see VARARGIN)

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

% Update handles structure
guida(hObject, handles);

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

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

% hObject    handle to edit9 (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 edit9 as text
% str2double(get(hObject,'String')) returns contents of edit9 as a double

% --- Executes during object creation, after setting all properties.
function recivedpower_CreateFcn(hObject, eventdata, handles)

% hObject    handle to edit9 (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 pathlossestimation_Callback(hObject, eventdata, handles)
% hObject    handle to edit10 (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 edit10 as text
%        str2double(get(hObject,'String')) returns contents of edit10 as a double

% --- Executes during object creation, after setting all properties.
function pathlossestimation_CreateFcn(hObject, eventdata, handles)
% hObject handle to pathlossestimation (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 calculatetransmitpower_Callback(hObject, eventdata, handles)
% hObject handle to pathlossestimation_button (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 edit11 as text
%        str2double(get(hObject,'String')) returns contents of edit11 as a double

% --- Executes during object creation, after setting all properties.
function calculatetransmitpower_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit11 (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 transmitpowertoenB_Callback(hObject, eventdata, handles)
% hObject        handle to edit12 (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 edit12 as text
%        str2double(get(hObject,'String')) returns contents of edit12
%        as a double

% --- Executes during object creation, after setting all properties.
function transmitpowertoenB_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit12 (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 recivedpoweratenB_Callback(hObject, eventdata, handles)
    % hObject    handle to edit13 (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 edit13 as text
    %        str2double(get(hObject,'String')) returns contents of edit13 as a double

    if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
        set(hObject,'BackgroundColor','white');
    end

function calculatethecellthroughput_Callback(hObject, eventdata, handles)
    % hObject    handle to edit14 (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 edit14 as text
% str2double(get(hObject,'String')) returns contents of edit14 as a double
% --- Executes during object creation, after setting all properties.
function calculatethecellthroughput_CreateFcn(hObject, eventdata, handles)
  % hObject    handle to edit14 (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
end

function enBtransmitsignal_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 enBtransmitsignal_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
end
function recivedpower_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 recivedpower_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 estimationpathloss_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 estimationpathloss_CreateFcn(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)
% 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 decidetransmitpower_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 decidetransmitpower_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

function calculatetransmitpower_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 calculatetransmitpower_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

function transmitpowerincaseofclosedloop_Callback(hObject, eventdata, handles)
% hObject    handle to edit6 (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 edit6 as text
%        str2double(get(hObject,'String')) returns contents of edit6 as a
%                double

% --- Executes during object creation, after setting all properties.
function transmitpowerincaseofclosedloop_CreateFcn(hObject, eventdata, handles)
function transmitpowertoenB_Callback(hObject, eventdata, handles)
    % hObject    handle to edit7 (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 edit7 as text
    str2double(get(hObject,'String')) returns contents of edit7 as a double

    % --- Executes during object creation, after setting all properties.
    function transmitpowertoenB_CreateFcn(hObject, eventdata, handles)
        % hObject    handle to edit7 (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
    end

    function edit8_Callback(hObject, eventdata, handles)
% hObject    handle to edit8 (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 edit8 as text
% str2double(get(hObject,'String')) returns contents of edit8 as a double

% --- Executes during object creation, after setting all properties.
function measuringreceivedSINR_CreateFcn(hObject, eventdata, handles)
    % hObject    handle to edit8 (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 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)
    Po=-38;
a=0.4;
PL=20;
Pr=Po+(a-1)*PL;
set(handles.text2,'string',Pr);

% --- Executes on button press in pushbutton18.
function pushbutton18_Callback(hObject, eventdata, handles)
    % hObject    handle to pushbutton18 (see GCBO)
Pmax=24;
M=180;
a=1;
Po=-10;
PL=20;
Pol={Pmax,10*log10(M)+Po+a*PL}
handles.Pol=get(hObject,'value')
guidata(hObject, handles);

% --- Executes on button press in pushbutton19.
function pushbutton19_Callback(hObject, eventdata, handles)
% 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)
Pmax=24;
M=180;
a=0.4;
Po=-38;
PL=20;
Pol=32;
deltai=-1;
Pcl={Pmax,Pol+deltai}
guidata(hObject, handles);

% --- Executes on button press in pushbutton20.
function pushbutton20_Callback(hObject, eventdata, handles)
% 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)
%------------power spectral density calculation(GIPC algorithm)-----
Io=str2num(get(handles.edit10,'string'));
B=str2num(get(handles.edit11,'string'));
PGs=20;
PGi=-70;
Y=0.5;
PSDi=Io-PGs*B-PGi*Y;
set(handles.text11,'string',PSDi);

% --- Executes on button press in pushbutton21.
function pushbutton21_Callback(hObject, eventdata, handles)
% 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)
%-------------combined open and closed loop algorithm-------------------
for a=0:0.1:1
for Po =-38:10:-80
PRXDL=23;
deltaUE=10;
deltaTF=-4;
Pmax=24;
Prb={Po-a*PRXDL+deltaUE+deltaTF,Pmax}
guidata(hObject, handles);
figure
grid on
hold on
plot(Po,Prb,'--ro')
end
end

function calculateuserthroughput_Callback(hObject, eventdata, handles)
% hObject    handle to edit15 (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 edit15 as text
% str2double(get(hObject,'String')) returns contents of edit15 as a double
function calculateuserthroughput_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit15 (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 calculatepowerspectraldensity_Callback(hObject, eventdata, handles)
% hObject    handle to edit16 (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 edit16 as text
% str2double(get(hObject,'String')) returns contents of edit16 as a double

function calculatepowerspectraldensity_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit16 (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 calculateSINR_Callback(hObject, eventdata, handles)
% hObject    handle to edit17 (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 edit17 as text
% str2double(get(hObject,'String')) returns contents of edit17 as a double

% --- Executes during object creation, after setting all properties.
function calculateSINR_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit17 (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 setTPCcommand_Callback(hObject, eventdata, handles)
% hObject    handle to edit18 (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 edit18 as text
%str2double(get(hObject,'String')) returns contents of edit18 as a double
% --- Executes during object creation, after setting all properties.
function setTPCcommand_CreateFcn(hObject, eventdata, handles)
  hObject    handle to edit18 (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 pushbutton14.
function pushbutton14_Callback(hObject, eventdata, handles)
  hObject    handle to pushbutton14 (see GCBO)
  eventdata  reserved - to be defined in a future version of MATLAB
  handles    structure with handles and user data (see GUIDATA)
  % THE Generalized Interference Power Control (GIPC) Algorithm
  %------------------------calculate the cell throughput------------------------
  % c : the bandwidth
  % PB: the physical resource block
  % T : the cell throughput
  C= str2num(get(handles.edit6,'string'));
  PB= str2num(get(handles.edit7,'string'));
  T= C*PB;
  set(handles.text5,'string',T);
  axes(handles.axes1);
  cla;
  plot(T,C)
grid
% --- Executes on button press in pushbutton15.
function pushbutton15_Callback(hObject, eventdata, handles)
% 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)
%---------------------the user throughput---------------------
W=str2num(get(handles.edit8,'string')); %the bandwidth of one physical resource blok
SINReff=str2num(get(handles.edit9,'string'));%signal to interference noise efficiency
V=0.68;%correction factor
M=50;%the number of physical resource allocated
Weff=0.72;% the bandwidth efficiency
SINR=.2;
Tr=W*Weff*V*M*log2(1+(SINR/SINReff));
set(handles.text6,'string',Tr);

% --- Executes on button press in pushbutton16.
function pushbutton16_Callback(hObject, eventdata, handles)
% 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)
%-----------------------GIPC algorithm---------------------
Io=str2num(get(handles.edit10,'string'));
B=str2num(get(handles.edit11,'string'));
PGs=20;
PGi=-70 ;
Y=0.5;
PSDi=Io-PGs*B-PGi*Y;
set(handles.text11,'string',PSDi);

% --- Executes on button press in pushbutton17.
function pushbutton17_Callback(hObject, eventdata, handles)
% 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)
%-----------------------signal to interference noise ratio calculation-
B=str2num(get(handles.edit12,'string'));
Y=str2num(get(handles.edit13,'string'));
Io=-157;
PGs=134;
PGi=20;
I=-40;
N=-174;
Si=Io*(PGs^1-B)/(PGi^Y*(I+N));
set(handles.text12,'string',Si);

% --- 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)
%----------------------open loop algorithm using path loss----------------------
Po=-81;
a=0.8;
PL=20;
PSDtx=Po+a*PL
guida(hObject, handles);
plot(a,PL(2,:),'color','b','Linestyle','--','Marker','.');
plot(a,PL(1,:),'color','r','Linestyle','--','Marker','.');
xlabel('PL [dB]')
ylabel('alpha')
grid on

% --- 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)
%-------------calculate the power recived from eNB using pathloss----------
Po=-38;
a=0.4;
PL=20;
PSDrx=Po+(a-1)*PL
guidata(hObject, handles);

% --- 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)

%-------------------estimation path loss----------------------
a=0.6;
Ph=23;
M=180;
Po=-58;
i=3;
PL=1/(a*(Ph-10*log10(M)-Po-a*i))
guida(hObject, handles);

% --- Executes on button press in pushbutton12.
function pushbutton12_Callback(hObject, eventdata, handles)

% hObject    handle to pushbutton12 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

%-------------------decide transmission power---------------------
for a=0:0.1:1
SNRo=-5:0.1:5;
Pn=-116;
Pmax=23;
pl=20;
Pttx=a*(SNRo+Pn)+(1-a)*(Pmax)+a*pl;
guida(hObject, handles);
set(a,'XTick',0:0.1:1)
set(a,'XTickLabel',{'0.1','0.2','0.3','0.4','0.5'})
xlabel('a')
ylabel('SINRo')
title('Plot of Ptx')
hold on
end

% --- Executes on button press in pushbutton13.
function pushbutton13_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton13 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
%-------------------------------------------------- FPC algorithm------------------
for a=0:0.1:1
    Po=[-20,-38,-59,-81,-102,-110];
    PG=-100;
    Ptr=Po-a*PG;
    guidata(hObject, handles);
    figure
    plot(Po,Pol,'-.m*')
    grid on
    hold on
end

% --- 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)
a=0.6;
Ph=23;
M=180;
Po=-58;
i=3;
PL=1/(a*(Ph-10*log10(M)-Po-a*i));
set(handles.text3,'string',PL);
% --- Executes on button press in pushbutton4.
function pushbutton4_Callback(hObject, eventdata, handles)
    a=0.8;
    SNRo=5;
    Pn=-116;
    Pmax=23;
    pl=20;
    Ptx=a*(SNRo+Pn)+(1-a)*(Pmax)+a*pl;
    set(handles.text4,'string',Ptx);

% --- Executes on button press in pushbutton5.
function pushbutton5_Callback(hObject, eventdata, handles)
    for a=0:0.1:1
        for Po=-38:10:-80
            SNRo=5;
            Pn=-116;
            Pmax=23;
            pl=20;
            Ptx=a*(SNRo+Pn)+(1-a)*(Pmax)+a*pl;
            set(handles.text5,'string',Ptx);
        end
    end

% --- Executes on button press in pushbutton6.
function pushbutton6_Callback(hObject, eventdata, handles)
    for a=0:0.1:1
        for Po=-38:10:-80
        end
    end
end
a=0.8;
SNRo=5;
Pn=-116;
Pmax=23;
pl=20;
Ptx=a*(SNRo+Pn)+(1-a)*(Pmax)+a*pl;
set(handles.text5,'string',Ptx);
end
end

% --- Executes on button press in pushbutton7.
function pushbutton7_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton7 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
%-------------calculate the interference using GIPC algorithm---------
Io=-157;
PGI=3;
PGs=28;
B=0.5;
S=Io-(1-B)*(PGs-PGI);
set(handles.text7,'string',S);

% --- Executes on button press in pushbutton8.
function pushbutton8_Callback(hObject, eventdata, handles)
% 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)
%-------------------set TPC command-----------------------------
%transmit power command set depending on the difference between SINR and
%SINR target
TPC= SINR(i)- SINRtarget
SINR(i)=Pr(i)/(I+n)
Pr=PSD(i)*PG
SINRtarget=(a-1)*(PL-PLmax)+SINR(i)
if (-1 < difference[dB]) {
gui_State.gui_Callback = str2func(diffrence{0})
0 is sent
end
}
if (1 < difference[dB]){
gui_State.gui_Callback = str2func(diffrence{1})
1 is sent;
end
}
else if (difference[dB] > 5){
gui_State.gui_Callback = str2func(diffrence{3})
3 is sent;
end
}