function varargout = ParameterCali\_GUI(varargin)

% PARAMETERCALI\_GUI MATLAB code for ParameterCali\_GUI.fig

% PARAMETERCALI\_GUI, by itself, creates a new PARAMETERCALI\_GUI or raises the existing

% singleton\*.

%

% H = PARAMETERCALI\_GUI returns the handle to a new PARAMETERCALI\_GUI or the handle to

% the existing singleton\*.

%

% PARAMETERCALI\_GUI('CALLBACK',hObject,eventData,handles,...) calls the local

% function named CALLBACK in PARAMETERCALI\_GUI.M with the given input arguments.

%

% PARAMETERCALI\_GUI('Property','Value',...) creates a new PARAMETERCALI\_GUI or raises the

% existing singleton\*. Starting from the left, property value pairs are

% applied to the GUI before ParameterCali\_GUI\_OpeningFcn gets called. An

% unrecognized property name or invalid value makes property application

% stop. All inputs are passed to ParameterCali\_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 ParameterCali\_GUI

% Last Modified by GUIDE v2.5 19-Apr-2018 10:52:41

% Begin initialization code - DO NOT EDIT

gui\_Singleton = 1;

gui\_State = struct('gui\_Name', mfilename, ...

 'gui\_Singleton', gui\_Singleton, ...

 'gui\_OpeningFcn', @ParameterCali\_GUI\_OpeningFcn, ...

 'gui\_OutputFcn', @ParameterCali\_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 ParameterCali\_GUI is made visible.

function ParameterCali\_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 ParameterCali\_GUI (see VARARGIN)

% Choose default command line output for ParameterCali\_GUI

handles.output = hObject;

% Update handles structure

guidata(hObject, handles);

% UIWAIT makes ParameterCali\_GUI wait for user response (see UIRESUME)

% uiwait(handles.figure1);

% --- Outputs from this function are returned to the command line.

function varargout = ParameterCali\_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 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)

[YH,muH,KS,KoH]=XHcalibration(handles);

[YA,muA,KN,KoA]=XAcalibration(handles);

[bresH,bresA,binaH,binaA]=DOcalibration(handles);

set(handles.YH\_tag,'string',num2str(YH))

set(handles.muH\_tag,'string',num2str(muH))

set(handles.KS\_tag,'string',num2str(KS))

set(handles.KoH\_tag,'string',num2str(KoH))

set(handles.YA\_tag,'string',num2str(YA))

set(handles.muA\_tag,'string',num2str(muA))

set(handles.KN\_tag,'string',num2str(KN))

set(handles.KoA\_tag,'string',num2str(KoA))

set(handles.bresH\_tag,'string',num2str(bresH))

set(handles.bresA\_tag,'string',num2str(bresA))

set(handles.binaH\_tag,'string',num2str(binaH));

set(handles.binaA\_tag,'string',num2str(binaA));

% --- 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)

[YH,muH,KS,KoH,t\_H,S\_H,RSS\_H]=XHcalibration(handles);

[YA,muA,KN,KoA,t\_A,S\_A,RSS\_A]=XAcalibration(handles);

[bresH,bresA,binaH,binaA,t\_O,S\_O,RSS\_O]=DOcalibration(handles);

data\_H=get(handles.XHdata,'data');

data\_A=get(handles.XAdata,'data');

data\_O=get(handles.RESdata,'data');

Xdata\_H=data\_H(:,1);

Ydata\_H=data\_H(:,2);

Xdata\_A=data\_A(:,1);

Ydata\_A=data\_A(:,2);

Xdata\_O=data\_O(:,1);

Ydata\_O=data\_O(:,2);

str=get(handles.TimeUnit,'string');

val=get(handles.TimeUnit,'value');

switch str{val}

 case 'second'

 ti\_H=t\_H\*60\*60\*24;

 ti\_A=t\_A\*60\*60\*24;

 ti\_O=t\_O\*60\*60\*24;

 TimeText='Time (scond)';

 case 'minute'

 ti\_H=t\_H\*60\*24;

 ti\_A=t\_A\*60\*24;

 ti\_O=t\_O\*60\*24;

 TimeText='Time (minute)';

 case 'hour'

 ti\_H=t\_H\*24;

 ti\_A=t\_A\*24;

 ti\_O=t\_O\*24;

 TimeText='Time (hour)';

 case 'day'

 ti\_H=t\_H;

 ti\_A=t\_A;

 ti\_O=t\_O;

 TimeText='Time (day)';

end

figure(1)

subplot(3,1,1)

plot(ti\_H,S\_H,'k-',Xdata\_H,Ydata\_H,'ko')

xlabel(TimeText)

ylabel('DO cocentration')

legend('Model data','Experimental data')

title(['Heterotrophic respiration, Residual sum of squres = '...

 num2str(RSS\_H)])

subplot(3,1,2)

plot(ti\_A,S\_A,'k-',Xdata\_A,Ydata\_A,'ko')

xlabel(TimeText)

ylabel('DO cocentration')

legend('Model data','Experimental data')

title(['Autotrophic respiration, Residual sum of squres = '...

 num2str(RSS\_A)])

subplot(3,1,3)

plot(ti\_O,S\_O,'k-',Xdata\_O,Ydata\_O,'ko')

xlabel(TimeText)

ylabel('DO cocentration')

legend('Model data','Experimental data')

title(['Endogenous respiration, Residual sum of squres = '...

 num2str(RSS\_O)])

% --- 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)

muH=str2double(get(handles.muH\_tag,'string'));

muA=str2double(get(handles.muA\_tag,'string'));

KS=str2double(get(handles.KS\_tag,'string'));

KN=str2double(get(handles.KN\_tag,'string'));

KoH=str2double(get(handles.KoH\_tag,'string'));

KoA=str2double(get(handles.KoA\_tag,'string'));

YH=str2double(get(handles.YH\_tag,'string'));

YA=str2double(get(handles.YA\_tag,'string'));

binaH=str2double(get(handles.binaH\_tag,'string'));

binaA=str2double(get(handles.binaA\_tag,'string'));

bresH=str2double(get(handles.bresH\_tag,'string'));

bresA=str2double(get(handles.bresA\_tag,'string'));

ParaVal=[muH KS KoH YH binaH bresH; muA KN KoA YA binaA bresA]';

setappdata(0,'CaliPara',ParaVal);

% --- 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)

YH=0.67; muH=6; KS=20; KoH=0.2;

YA=0.24; muA=0.8; KN=1; KoA=0.4;

bresH=0.32; bresA=0.12; binaH=0.08; binaA=0.03;

set(handles.YH\_tag,'string',num2str(YH))

set(handles.muH\_tag,'string',num2str(muH))

set(handles.KS\_tag,'string',num2str(KS))

set(handles.KoH\_tag,'string',num2str(KoH))

set(handles.YA\_tag,'string',num2str(YA))

set(handles.muA\_tag,'string',num2str(muA))

set(handles.KN\_tag,'string',num2str(KN))

set(handles.KoA\_tag,'string',num2str(KoA))

set(handles.bresH\_tag,'string',num2str(bresH))

set(handles.bresA\_tag,'string',num2str(bresA))

set(handles.binaH\_tag,'string',num2str(binaH));

set(handles.binaA\_tag,'string',num2str(binaA));

function binaA\_tag\_Callback(hObject, eventdata, handles)

% hObject handle to binaA\_tag (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 binaA\_tag as text

% str2double(get(hObject,'String')) returns contents of binaA\_tag as a double

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

function binaA\_tag\_CreateFcn(hObject, eventdata, handles)

% hObject handle to binaA\_tag (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 binaH\_tag\_Callback(hObject, eventdata, handles)

% hObject handle to binaH\_tag (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 binaH\_tag as text

% str2double(get(hObject,'String')) returns contents of binaH\_tag as a double

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

function binaH\_tag\_CreateFcn(hObject, eventdata, handles)

% hObject handle to binaH\_tag (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 bresA\_tag\_Callback(hObject, eventdata, handles)

% hObject handle to bresA\_tag (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 bresA\_tag as text

% str2double(get(hObject,'String')) returns contents of bresA\_tag as a double

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

function bresA\_tag\_CreateFcn(hObject, eventdata, handles)

% hObject handle to bresA\_tag (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 bresH\_tag\_Callback(hObject, eventdata, handles)

% hObject handle to bresH\_tag (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 bresH\_tag as text

% str2double(get(hObject,'String')) returns contents of bresH\_tag as a double

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

function bresH\_tag\_CreateFcn(hObject, eventdata, handles)

% hObject handle to bresH\_tag (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 YA\_tag\_Callback(hObject, eventdata, handles)

% hObject handle to YA\_tag (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 YA\_tag as text

% str2double(get(hObject,'String')) returns contents of YA\_tag as a double

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

function YA\_tag\_CreateFcn(hObject, eventdata, handles)

% hObject handle to YA\_tag (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 muA\_tag\_Callback(hObject, eventdata, handles)

% hObject handle to muA\_tag (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 muA\_tag as text

% str2double(get(hObject,'String')) returns contents of muA\_tag as a double

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

function muA\_tag\_CreateFcn(hObject, eventdata, handles)

% hObject handle to muA\_tag (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 KN\_tag\_Callback(hObject, eventdata, handles)

% hObject handle to KN\_tag (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 KN\_tag as text

% str2double(get(hObject,'String')) returns contents of KN\_tag as a double

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

function KN\_tag\_CreateFcn(hObject, eventdata, handles)

% hObject handle to KN\_tag (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 KoA\_tag\_Callback(hObject, eventdata, handles)

% hObject handle to KoA\_tag (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 KoA\_tag as text

% str2double(get(hObject,'String')) returns contents of KoA\_tag as a double

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

function KoA\_tag\_CreateFcn(hObject, eventdata, handles)

% hObject handle to KoA\_tag (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 KoH\_tag\_Callback(hObject, eventdata, handles)

% hObject handle to KoH\_tag (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 KoH\_tag as text

% str2double(get(hObject,'String')) returns contents of KoH\_tag as a double

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

function KoH\_tag\_CreateFcn(hObject, eventdata, handles)

% hObject handle to KoH\_tag (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 KS\_tag\_Callback(hObject, eventdata, handles)

% hObject handle to KS\_tag (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 KS\_tag as text

% str2double(get(hObject,'String')) returns contents of KS\_tag as a double

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

function KS\_tag\_CreateFcn(hObject, eventdata, handles)

% hObject handle to KS\_tag (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 muH\_tag\_Callback(hObject, eventdata, handles)

% hObject handle to muH\_tag (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 muH\_tag as text

% str2double(get(hObject,'String')) returns contents of muH\_tag as a double

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

function muH\_tag\_CreateFcn(hObject, eventdata, handles)

% hObject handle to muH\_tag (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 YH\_tag\_Callback(hObject, eventdata, handles)

% hObject handle to YH\_tag (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 YH\_tag as text

% str2double(get(hObject,'String')) returns contents of YH\_tag as a double

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

function YH\_tag\_CreateFcn(hObject, eventdata, handles)

% hObject handle to YH\_tag (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 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)

data=get(handles.RESdata,'data');

data(end+1,:)=0;

set(handles.RESdata,'data',data)

% --- 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)

set(handles.RESdata,'data',[0 0])

% --- 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)

set(handles.XAdata,'data',[0 0])

% --- 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)

data=get(handles.XAdata,'data');

data(end+1,:)=0;

set(handles.XAdata,'data',data)

% --- Executes on button press in pushbutton6.

function pushbutton6\_Callback(hObject, eventdata, handles)

% 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)

data=get(handles.XHdata,'data');

data(end+1,:)=0;

set(handles.XHdata,'data',data)

% --- 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)

set(handles.XHdata,'data',[0 0])

function XH\_tag\_Callback(hObject, eventdata, handles)

% hObject handle to XH\_tag (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 XH\_tag as text

% str2double(get(hObject,'String')) returns contents of XH\_tag as a double

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

function XH\_tag\_CreateFcn(hObject, eventdata, handles)

% hObject handle to XH\_tag (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 XA\_tag\_Callback(hObject, eventdata, handles)

% hObject handle to XA\_tag (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 XA\_tag as text

% str2double(get(hObject,'String')) returns contents of XA\_tag as a double

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

function XA\_tag\_CreateFcn(hObject, eventdata, handles)

% hObject handle to XA\_tag (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 Sn\_tag\_Callback(hObject, eventdata, handles)

% hObject handle to Sn\_tag (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 Sn\_tag as text

% str2double(get(hObject,'String')) returns contents of Sn\_tag as a double

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

function Sn\_tag\_CreateFcn(hObject, eventdata, handles)

% hObject handle to Sn\_tag (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 Ss\_tag\_Callback(hObject, eventdata, handles)

% hObject handle to Ss\_tag (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 Ss\_tag as text

% str2double(get(hObject,'String')) returns contents of Ss\_tag as a double

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

function Ss\_tag\_CreateFcn(hObject, eventdata, handles)

% hObject handle to Ss\_tag (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 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)

[name,path]=uigetfile({'\*.xlsx';'\*.xls'},'File selector');

filename=[path name];

XHread=xlsread(filename,'A:B');

XAread=xlsread(filename,'C:D');

RESread=xlsread(filename,'E:F');

set(handles.XHdata,'data',XHread)

set(handles.XAdata,'data',XAread)

set(handles.RESdata,'data',RESread)

% --- Executes on selection change in TimeUnit.

function TimeUnit\_Callback(hObject, eventdata, handles)

% hObject handle to TimeUnit (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 TimeUnit contents as cell array

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

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

function TimeUnit\_CreateFcn(hObject, eventdata, handles)

% hObject handle to TimeUnit (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

function [YH,muH,KS,KoH,t,S,resnorm]=XHcalibration(handles)

XH=str2double(get(handles.XH\_tag,'string'));

Ss=str2double(get(handles.Ss\_tag,'string'));

exdata=get(handles.XHdata,'data');

So=exdata(1,2);

Y\_in=str2double(get(handles.YH\_tag,'string'));

mu\_in=str2double(get(handles.muH\_tag,'string'));

Ks\_in=str2double(get(handles.KS\_tag,'string'));

Ko\_in=str2double(get(handles.KoH\_tag,'string'));

str=get(handles.TimeUnit,'string');

val=get(handles.TimeUnit,'value');

switch str{val}

 case 'second'

 time=exdata(:,1)/60/60/24;

 case 'minute'

 time=exdata(:,1)/60/24;

 case 'hour'

 time=exdata(:,1)/24;

 case 'day'

 time=exdata(:,1);

end

DO=exdata(:,2);

xo=[Y\_in mu\_in Ks\_in Ko\_in];

if get(handles.HBR10,'value')

 BR=0.1;

elseif get(handles.HBR20,'value')

 BR=0.2;

elseif get(handles.HBR50,'value')

 BR=0.5;

elseif get(handles.HBR100,'value')

 BR=1;

end

lb=xo-BR\*xo;

ub=xo+BR\*xo;

[x,resnorm]=lsqcurvefit(@Monod,xo,time,DO,lb,ub,[],XH,Ss,So);

YH=x(1); muH=x(2); KS=x(3); KoH=x(4);

t=linspace(0,time(end),200);

S=Monod(x,t,XH,Ss,So);

function S=Monod(x,time,XH,Ss,So)

Y=x(1);

mu=x(2);

Ks=x(3);

Ko=x(4);

[t,S]=ode45(@respmodel,time,So,[],XH,Ss,mu,Ks,Ko,Y);

function dSdt=respmodel(t,So,XH,Ss,mu,Ks,Ko,Y)

dSdt=-((1-Y)/Y)\*mu\*XH\*(Ss/(Ks+Ss))\*(So/(Ko+So));

function [YA,muA,KN,KoA,t,S,resnorm]=XAcalibration(handles)

XA=str2double(get(handles.XA\_tag,'string'));

Sn=str2double(get(handles.Sn\_tag,'string'));

exdata=get(handles.XAdata,'data');

So=exdata(1,2);

Y\_in=str2double(get(handles.YA\_tag,'string'));

mu\_in=str2double(get(handles.muA\_tag,'string'));

Ks\_in=str2double(get(handles.KN\_tag,'string'));

Ko\_in=str2double(get(handles.KoA\_tag,'string'));

str=get(handles.TimeUnit,'string');

val=get(handles.TimeUnit,'value');

switch str{val}

 case 'second'

 time=exdata(:,1)/60/60/24;

 case 'minute'

 time=exdata(:,1)/60/24;

 case 'hour'

 time=exdata(:,1)/24;

 case 'day'

 time=exdata(:,1);

end

DO=exdata(:,2);

xo=[Y\_in mu\_in Ks\_in Ko\_in];

if get(handles.ABR10,'value')

 BR=0.1;

elseif get(handles.ABR20,'value')

 BR=0.2;

elseif get(handles.ABR50,'value')

 BR=0.5;

elseif get(handles.ABR100,'value')

 BR=1;

end

lb=xo-BR\*xo;

ub=xo+BR\*xo;

[x,resnorm]=lsqcurvefit(@Monod,xo,time,DO,lb,ub,[],XA,Sn,So);

YA=x(1); muA=x(2); KN=x(3); KoA=x(4);

t=linspace(0,time(end),200);

S=Monod(x,t,XA,Sn,So);

function S=Monod(x,time,XA,Sn,So)

Y=x(1);

mu=x(2);

Ks=x(3);

Ko=x(4);

[t,S]=ode45(@respmodel,time,So,[],XA,Sn,mu,Ks,Ko,Y);

function dSdt=respmodel(t,So,XA,Sn,mu,Ks,Ko,Y)

dSdt=-((4.57-Y)/Y)\*mu\*XA\*(Sn/(Ks+Sn))\*(So/(Ko+So));



Model calibration platform to estimate parameter values (left frame) with experimental data (right frame).