

MATLAB 圖形使用者介面 基本架構與元件控制

盧家鋒 助理教授
alvin4016@ym.edu.tw



請先下載本週上課資料

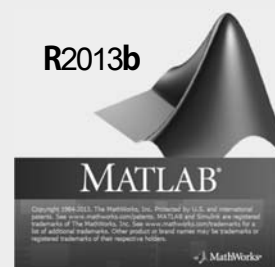
- <http://www.ym.edu.tw/~cflu>
- 點選左欄 [課程資料] → [MATLAB圖形使用者介面]
- 下載第8週 [上課資料] [materials_L8.zip](#) · 檔案大小約2KB

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本週內容

- 基本觀念與架構
- UI物件控制

Function
Global variables
Object Handle
Uicontrol property
Signal plot

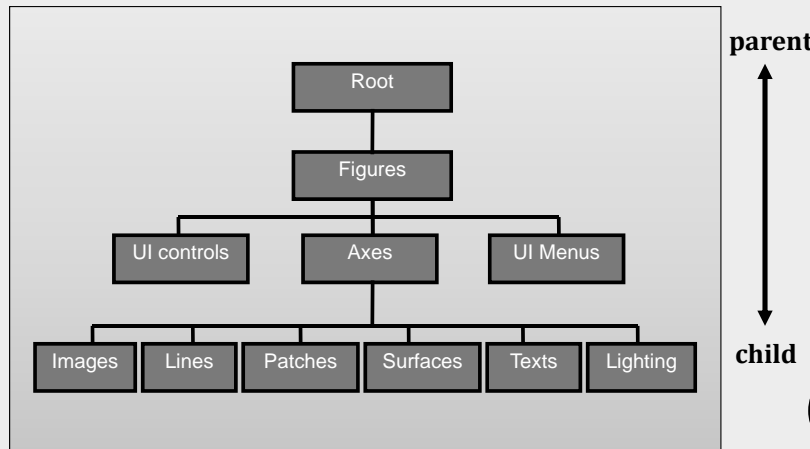


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基本觀念與架構

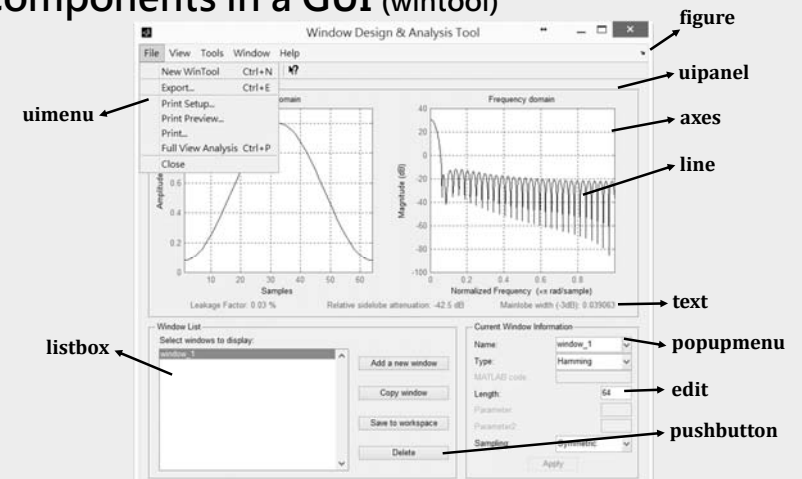
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Hierarchical Relations



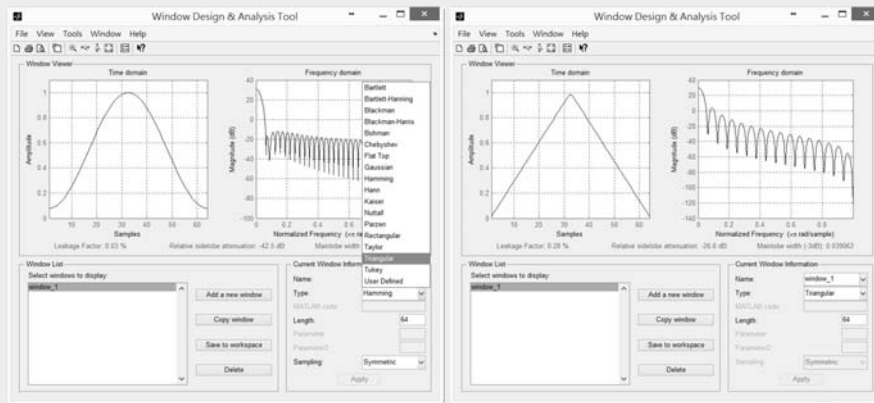
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Components in a GUI (wintool)



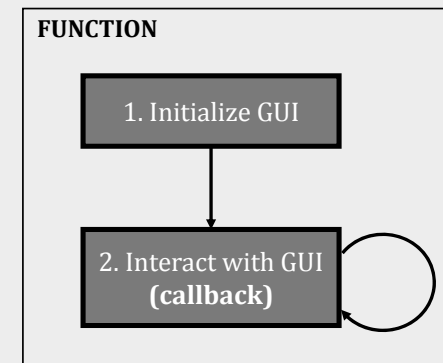
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Interact with GUI



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Core Concept of GUI



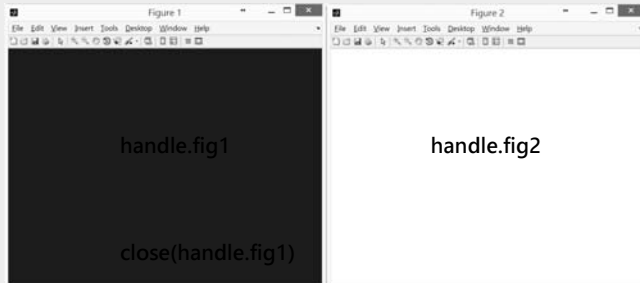
Learn how to deal with

- handle
- Data

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handle – Name of Object

- It is convenient to put all handles of objects under a structure variable "handle"
 - `handle.fig1=figure('color',[0.5 0 0]);`
 - `handle.fig2=figure('color',[1 1 1]);`



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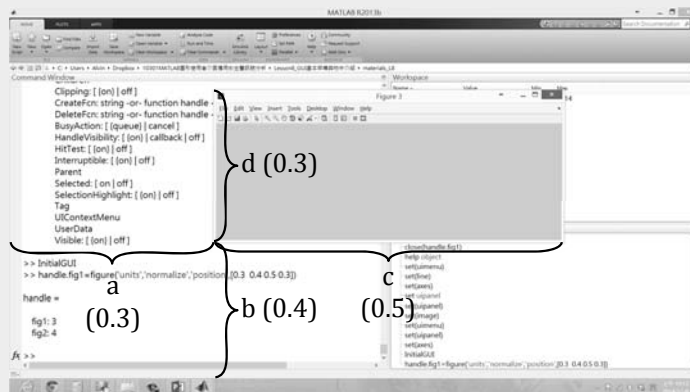
Object Properties

- `set(Object)`
 - Object can be a
 - figure, axes, line, image, uipanel, uicontrol, uimenu,...
 - handle
- Common properties
 - Parent
 - Units, Position (except for line and image)
 - Color/ BackgroundColor/ ForegroundColor
 - Name/ Title/ String

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Position property

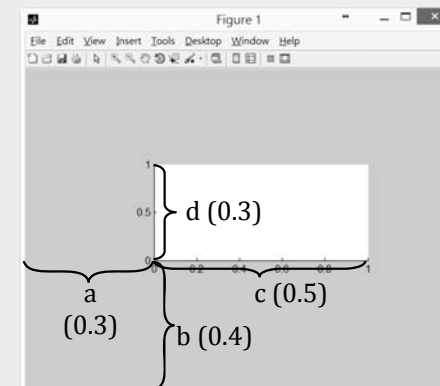
- `figure('units','normalize','position',[a b c d])`



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Position property

- `axes('units','normalize','position',[a b c d])`



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Initialize GUI - figure

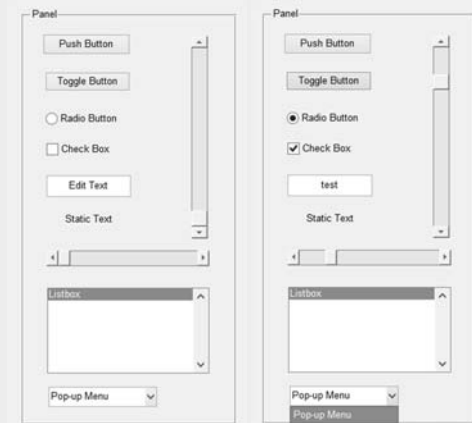
Try it!

- `handle.fig1=figure('units','normalize','position',[0.1 0.1 0.5 0.75],...
'color',[0.5 0 0],'Name','Main Figure');`
- `handle.fig2=figure('units','normalize','position',[0.6 0.1 0.3 0.75],...
'color',[1 1 1],'Name','Bulletin Figure');`

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uicontrol Style

- Pushbutton
- Togglebutton
- Radiobutton
- Checkbox
- Edit
- Text
- Slider
- Frame
- Listbox
- Popupmenu



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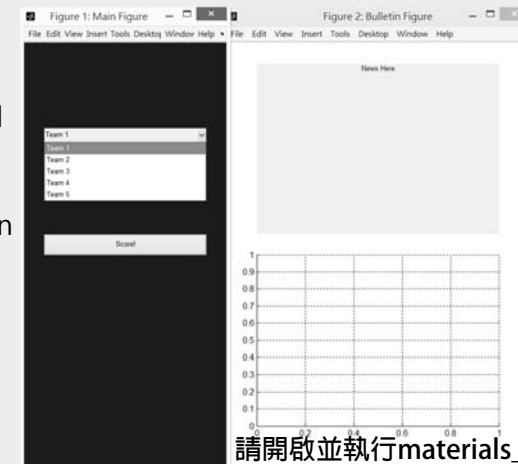
Initialize GUI - uicontrol

- `handle.fig1=figure;`
- `handle.button = uicontrol('Parent',handle.fig1,...
'Units','normalized','Position',[0.1 0.5 0.4 0.15],...
'Style','pushbutton',...
'String','test');`
- `handle.popup = uicontrol('Parent',handle.fig1,...
'Units','normalized','Position',[0.1 0.7 0.4 0.1],...
'Style','popupmenu',...
'String','Option 1|Option 2|Option 3');`

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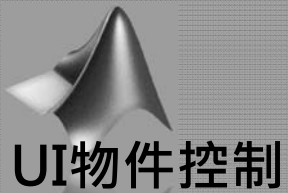
Excercise

- Create 2 figures.
- Add a popupmenu and a pushbutton on fig. 1.
- Add a text and an axes on fig. 2.



請開啟並執行materials_L8\InitialGUI

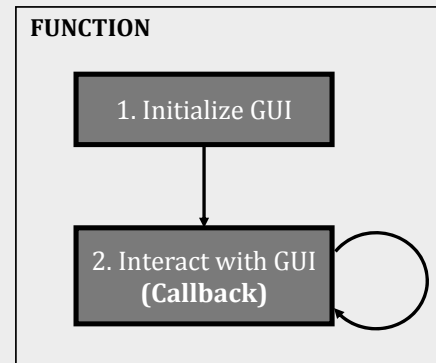
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UI物件控制

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Core Concept of GUI



- Learn how to deal with
- handle
 - Data

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How to Interact with GUI?

- Function + if-elseif 請開啟materials_L8\testGUI

```
1 function testGUI(action)
2
3 if strcmp(action,'start'),
4     % initialize GUI
5     figure,
6 elseif strcmp(action,'change color')
7     % callback of button
8     set(gcf,'color',[1 1 1])
9 end
```

strcmp
gcf

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Keypoints of GUI

- function
- if-else-end

- Callback property of object
- global variables
- set & get

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Callback Property

- `handle.button_score = uicontrol('Parent',handle.fig1,...`
 `'Units','normalized','Position',[0.1 0.5 0.8 0.05],...`
 `'Style','pushbutton',...`
 `'String','Score!',...`
 `'Callback','1+1');` ← 請開啟materials_L8\InitialGUI
 並新增第21行

When pressing pushbutton, what happens in the command window?

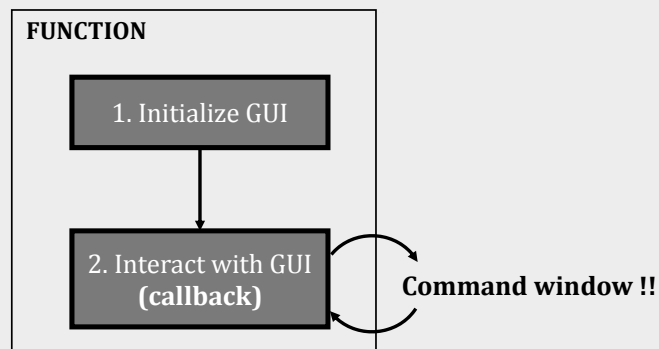
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Rewrite InitialGUI.m

- Add function, if-esleif-end
 - One block for initializing GUI (**make it default**)
 - One block for callback of `button_score`
- Add callback to `handle.button_score`
 - Try `'Callback';InitialGUI('button_score')`

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Global Variables



Make variables that you keep using **GLOBAL!**
global handle

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set & get

- Can we **get** the value (selection) of the popupmenu?
- Can we **set** the messages to the text uicontrol?

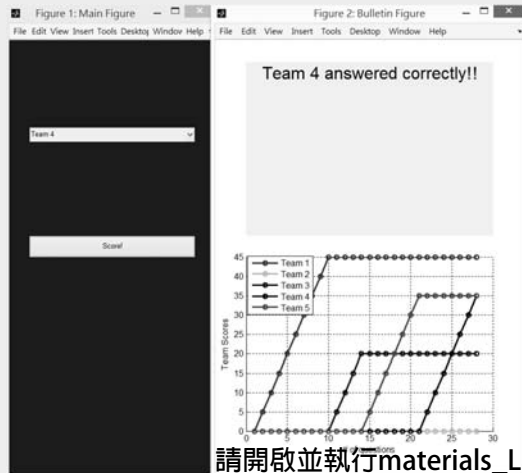
- Or can we do both?

```
team=get(handle.popup_team,'value');
set(handle.text_mesg,'string',...
    ['Team ' num2str(team) ' answered correctly!!'],...
    'fontsize',20)
```

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Challenge

- Use GUI to display the accumulated team scores!



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THE END

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alvin4016@ym.edu.tw