

Unity GUI

Clicking the non-existing button

Emil "AngryAnt" Johansen
Unity Technologies

Overview

- Retained mode
- Immediate mode
- Anatomy of a component
- GUI state
- GUI & GUILayout
- Events

Retained mode GUI

- Here is my button
- It will be blue
- It should read "Click me"
- When clicked, it will run this callback
- I shall call it Bob

Retained mode GUI

- Upside

- Component state encapsulated and easily accessible

- Downside

- Bob and friends crowd the place up
- Handling GUI state can get cumbersome

Immediate mode GUI

- During GUI
 - Place a label here
 - If this button here is pressed
 - Add one to this variable
 - If this boolean is set
 - Store the value of this text field in this variable

Immediate mode GUI

- Upside

- Extremely readable – component placement and handling in the same place
- No references or callbacks needed

- Downside

- Need to store state yourself – gets cluttered if you don't watch out

Unity uses immediate
mode GUI

Anatomy of a component

- A component is a function
- All state is passed via parameters
- State changes are returned or set on reference parameters

Anatomy of a component

- GUI styles handle the rendering and holds most rendering settings
- Styles are collected in skins
- A component accesses its style by name
 - So changing the active skin on the fly just works (assuming variants of the same style are available in the skins)

Anatomy of a component

- Optimal case for immediate mode
 - List / grid / whatever view with as complex item handling as needed

GUI state

- Some state is maintained by the system - FX
 - Focused control (id)
 - Input active control (id)
- As a component call is made, it is given an ID from the ID pool

GUI & GUILayout

- Components are handled on screen using rects
- `GUI(component)` lets you specify that rect
- `GUILayout(component)` calculates the rect needed to place the content in the layout
 - `GUIStyle.CalcSize`
 - `GUILayoutUtility.GetRect`

GUI & GUILayout

- `BeginHorizontal / EndHorizontal` and friends

GUI & GUILayout

- GUILayout can get expensive
 - Not recommended on mobile devices
 - Can be disabled via
`MonoBehaviour.useGUILayout`

Events

- The GUI methods are invoked multiple times per frame
 - Once per event
 - Layout (if used)
 - Input and others
 - Repaint is the last

Events

- Only do what you need per event
 - No need to draw stuff when not handling the Repaint event
- Remember the IDs!

One more thing

Editor scripting

Editor scripting

- In GUI for editor scripting, you are most commonly modifying data
 - That data is your state
 - Little or none excess state handling
 - Optimal case for immediate mode GUI

Resources

- Unite 07 GUI introduction w. Nicholas
- GUI/-Layout scripting reference
- EditorGUI/-layout scripting reference
- More examples on <http://AngryAnt.com>