Abertay University

Revision and GUI

CMP 301 Graphics Programming with Shaders

This week

- Revision
- GUI
- Coursework

Revision

- Only got one suggestion
  - Not appropriate for a revision lecture

GUI

- Need to provide some UI elements for user interaction
  - Avoid the large number of keyboard combinations required to control your scene
- Could build everything from scratch
  - But why re-invent the wheel
- Use a 3rd party library
  - ImGui

ImGui

- Promotes itself as Bloat-free Immediate Mode Graphical User interface for C++ with minimal dependencies
- Described as
  - ImGui is designed to enable fast iteration and empower programmers to create content creation tools and visualization/ debug tools (as opposed to UI for the average end-user). It favours simplicity and productivity
- What does this mean?
  - Provides a simple to use interface we can use to control variables within our application
  - Integrates nicely with several rendering pipelines (include the one we use)
  - Really quite straight forward

ImGui

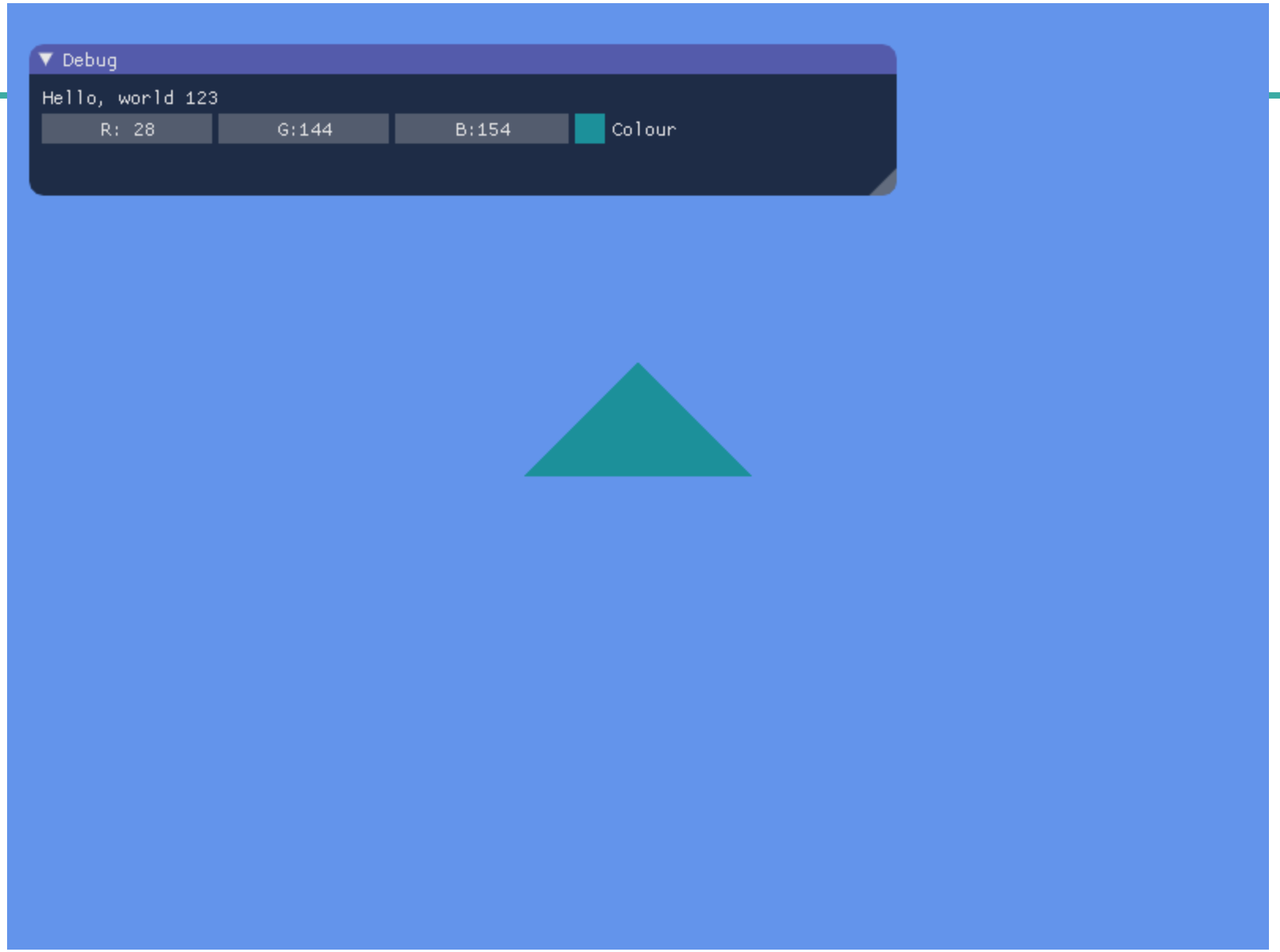

ImGui Demo
Menu Examples Help
90 deg
slider angle
R:255 G: 0 B: 51
color 1 (?)
R:102 G:178 B: 0 A:128
color 2
Orange
Pineapple
Strawberry
Watermelon
listbox (single select)
Range Widgets
Multi-component Widgets
Vertical Sliders
Graphs widgets
Animate
Frame Times
avg 0.0
Lines
Histogram
Sin
func
70
Sample count
Example: Property editor
Object_0
Object_1
Child_3700257420
Child_2063235384
Field_2
Field_3
Field_4
Field_5
Field_6
Field_7
Object_2
my sailor is rich
1.000
3.142
100.000
999.000000
0.000000
0.000000
Example: Log
Clear
Copy
Example: Custom rendering
Clear
Undo
Left-click and drag to add
Right-click to undo
Memory Editor
8 rows
Range E028E4..E03C93
Example: Layout
File
MyObject 0
MyObject 1
MyObject 2
MyObject 3
MyObject 4
MyObject 5
MyObject 6
MyObject 7
MyObject 8
MyObject 9
MyObject 10
MyObject 11
MyObject 12
MyObject 13
MyObject: 0
Lorem ipsum dolor sit amet,
consectetur adipiscing elit,
sed do eiusmod tempor
incididunt ut labore et dolore
magna aliqua.
Revert
Save
Example: Console
Enter 'HELP' for help, press TAB to use text completion.
Add Dummy Text
Add Dummy Error
Clear
Filter ("incl,-excl") ("error")
0 some text
some more text
display very important message here!
[error] something went wrong
Possible matches:
- HELP
- HISTORY
HELP
Commands:
- HELP
- HISTORY
- CLEAR
- CLASSIFY
hello, imgui world!
Unknown command: 'hello, imgui world!'
hello, imgui world!
Input
ImGui Test
Menu Examples
ImGui says hello.
Help
Window options
Widgets
Tree
Bullets
Colored Text
Word Wrapping
UTF-8 Text
Images
Selectables
Filtered Text Input
Multi-line Text Input
Button
checkbox
radio a
radio b
radio c
Hover over me - or me
Value
label
bbbb
combo
combo scroll
Hello, world!
input text (?)
123
input int (?)
0.001000
input float
0.100000
0.200000
0.300000
input float3
drag int (?)
drag int 0..100
drag float
0.006700 ns
drag small float
slider int (?)
ratio = 0.123
slider float
slider log float
0 deg
slider angle
R:255
G: 0
B: 51
color 1 (?)

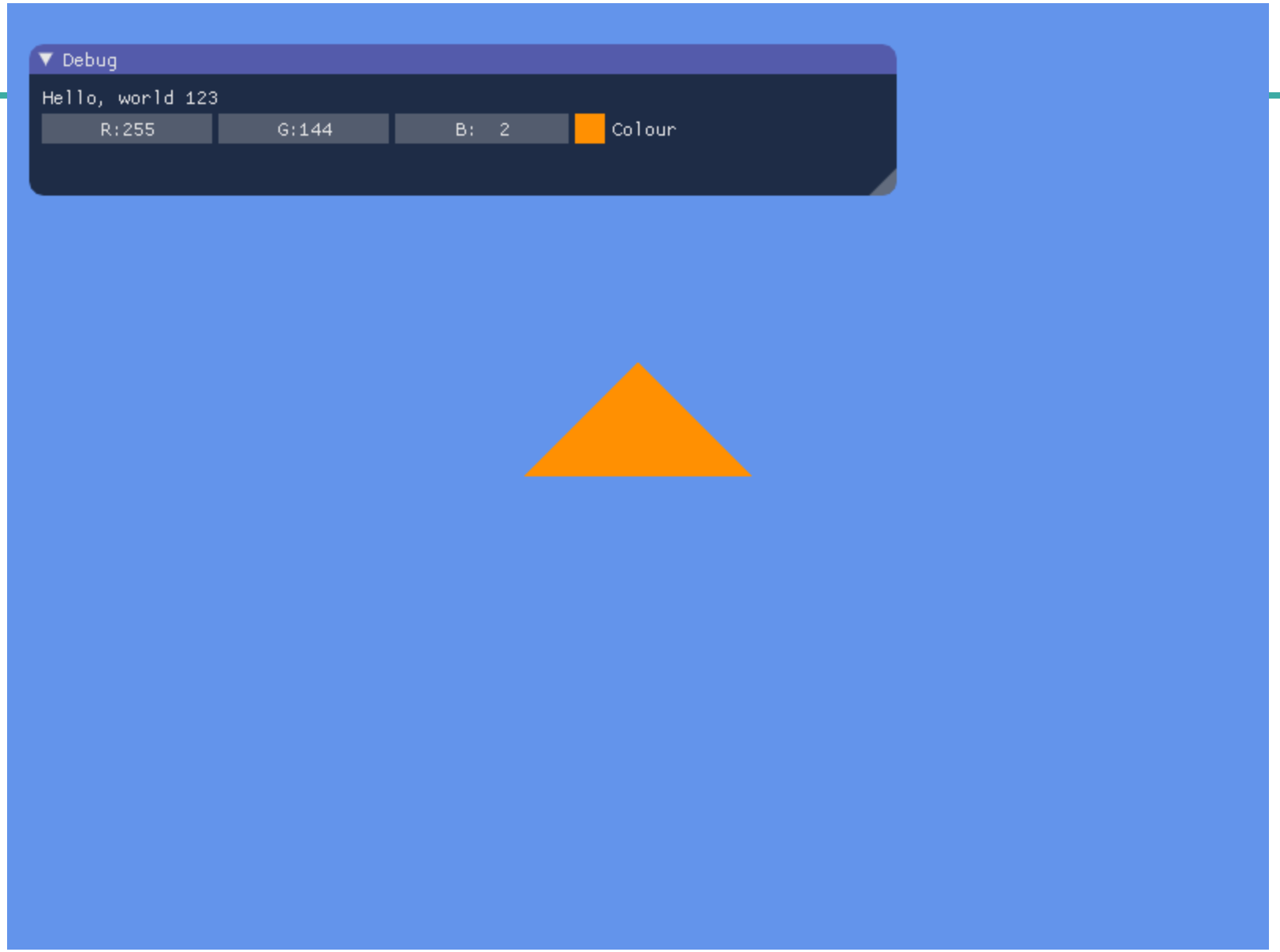
Example

- Controlling the colour of geometry using a GUI connected variable
  - Simple example
- ImGui is already integrated into the framework
  - I know some of you have been using it already
- Plenty documentation online
- I created a function to handle GUI rendering
  - Called before EndScene();

```
void App1::gui()
{
    // Build UI
    ImGui::Text("Hello, world %d", 123);
    ImGui::ColorEdit3("Colour", (float*)&clear_col);

    // Render UI
    ImGui::Render();
}
```

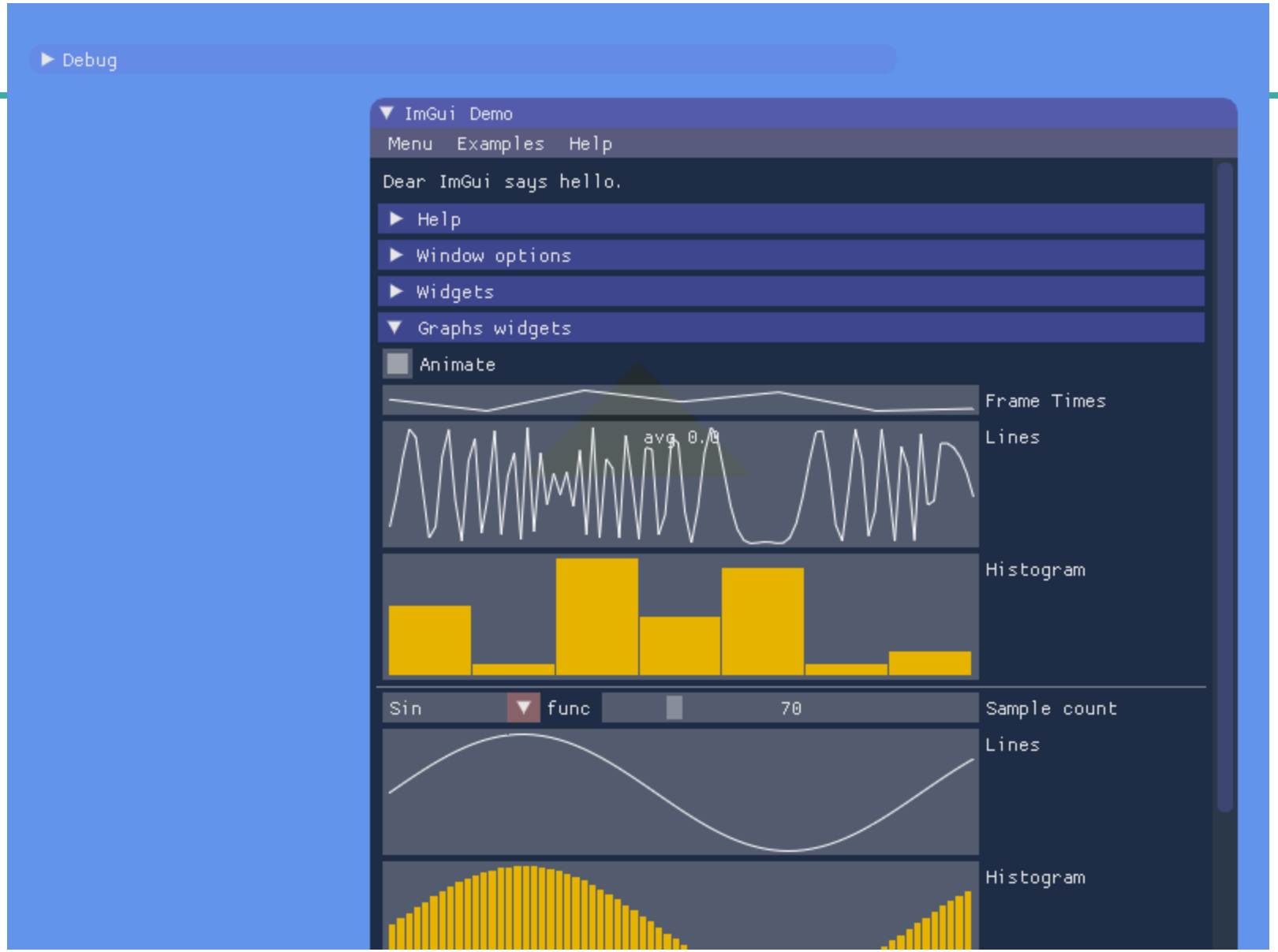

Debug
Hello, world 123
R: 28
G:144
B:154
Colour


Debug
Hello, world 123
R:255
G:144
B: 2
Colour

Test Window

- Shows off most of the UI elements

- ImGui::ShowTestWindow();


Debug
ImGui Demo
Menu Examples Help
Dear ImGui says hello.
Help
Window options
Widgets
Graphs widgets
Animate
Frame Times
Lines
Histogram
Sin
func
70
Sample count
Lines
Histogram

imGui

- I highly recommend using imGui for your coursework
  - If you have any controllable elements
    - Lights
    - Tessellation
    - Activating wireframe mode etc
- Using imGui is better than a long list of keyboard controls
- I will provide an example project

Coursework

- Does anyone have questions relating to coursework?

End of line

- This was the last lecture
- Remaining labs will run
  - Catch up and coursework