

Design Documentation

Good Team Name (GTN)

C++ | DirectX 11

Molecularity (WIP)

Game Name Ideas

- Aspect Shifter
- Garry's Mod
- Terry's Mod
- Terry's Chocolate Orange Mod
- Dairy Milk Destroyer's
- Modularity

Possible Themes

- Puzzles.
- Platforming.
- Portal-style room design.
- Temple/tomb design.
 - Lara Croft, Indiana Jones.
- First-person exploration/survival.

Design Aspects

- Maze: At the bottom of the temple.
 - Procedurally generated?
- Stealth: Increases as the players nears the bottom.
- End Boss: Guarding the treasure at the lowest level of the temple.

Game Elements

- Equip system.
- Menu/Inventory System
- Lighting intensity decreases further into the temple.

Game References

Slasher's Keep (Hack & Slash)



Going Under (Rouge-like)



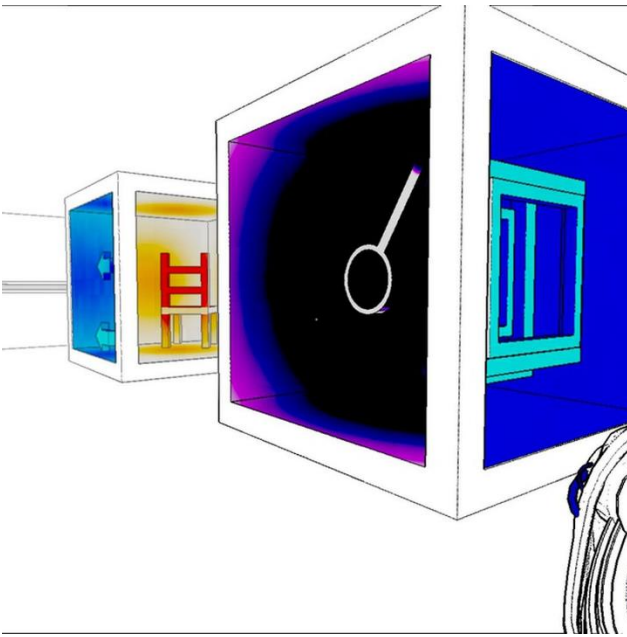
Immortals: Fenyx Rising (Puzzle Ideas?)



Superliminal



Antichamber



Crash Bandicoot 2 (Hub Room – Fixed camera follows player around the room)



Non-Euclidean Games - [How do non-euclidean games work?](#) | Bitwise



Subnautica



Multi-Tool Design Ideas



Image Reference - No Man's Sky

Material Transformation Device (MTD?)

- Adjust Acting Forces On Objects
 - Gravity/Weight
 - Gravity Strength
 - Conductivity/Magnetism
 - Drag/Push Objects
- Adjust Object Properties
 - Density/Mass
 - Bounciness
 - Flammable?
- Reset Object State
 - Set to Default State
- Adjust Object Size
 - Increase and Decrease Object Mass
- Multi-Tool Utility
 - Ammo System to Limit Uses
 - Grappling Hook?

Win32 Reference

Message Processing

- WindowProc callback function - [https://docs.microsoft.com/en-us/previous-versions/windows/desktop/legacy/ms633573\(v=vs.85\)](https://docs.microsoft.com/en-us/previous-versions/windows/desktop/legacy/ms633573(v=vs.85))
- Keyboard Input (Keyboard and Mouse Input) - <https://docs.microsoft.com/en-us/windows/win32/inputdev/keyboard-input>
- Raw Input - <https://docs.microsoft.com/en-us/windows/win32/inputdev/raw-input>

ComPtr

- ComPtr Class - <https://docs.microsoft.com/en-us/cpp/cppcx/wrl/comptr-class?view=msvc-160>
- ComPtr::Get | ComPtr::GetAddressOf - <https://docs.microsoft.com/en-us/cpp/cppcx/wrl/comptr-class?view=msvc-160#get>

DirectX 11 Reference

Shaders

- Work with shaders and shader resources - <https://docs.microsoft.com/en-us/windows/win32/direct3dgetstarted/work-with-shaders-and-shader-resources>
- Read from the vertex buffer - <https://docs.microsoft.com/en-us/windows/win32/direct3dgetstarted/work-with-shaders-and-shader-resources#read-from-the-vertex-buffers>
- Review the vertex shader - <https://docs.microsoft.com/en-us/windows/win32/direct3dgetstarted/work-with-shaders-and-shader-resources#review-the-vertex-shader>
- Review the pixel shader - <https://docs.microsoft.com/en-us/windows/win32/direct3dgetstarted/work-with-shaders-and-shader-resources#review-the-pixel-shader>

Constant Buffers

- How to: Create a Constant Buffer - <https://docs.microsoft.com/en-us/windows/win32/direct3d11/overviews-direct3d-11-resources-buffers-constant-how-to>
- D3D11_BUFFER_DESC - https://docs.microsoft.com/en-us/windows/win32/api/d3d11/ns-d3d11-d3d11_buffer_desc

Font Rendering

- SpriteBatch Class - [https://docs.microsoft.com/en-us/previous-versions/windows/xna/bb199034\(v=xnagamestudio.42\)](https://docs.microsoft.com/en-us/previous-versions/windows/xna/bb199034(v=xnagamestudio.42))
- SpriteFont Class - [https://docs.microsoft.com/en-us/previous-versions/windows/xna/bb464165\(v=xnagamestudio.30\)](https://docs.microsoft.com/en-us/previous-versions/windows/xna/bb464165(v=xnagamestudio.30))

Framework Reference

Shader Creation

- Header Declaration: `PixelShader pixelShader_Tex;`
- Source Definition: `hr = pixelShader_Tex.Initialize(device, L"Resources\\Shaders\\Primitive_Tex.fx");`

Constant Buffer Creation

- Header Declaration: `ConstantBuffer<CB_VS_matrix> cb_vs_matrix;`
- Source Definition: `hr = cb_vs_matrix.Initialize(device.Get(), context.Get());`

Reading Input

- Keyboard Input: `if (keyboard.KeyIsPressed('1') || keyboard.KeyIsPressed(VK_NUMPAD1))`
- Mouse Input: `if(me.GetType() == Mouse::MouseEvent::EventType::LPress`

Error Logging

- Logging HRESULT Exceptions:

```
COM_ERROR_IF_FAILED( hr, "Failed to create box texture from file!" );
```

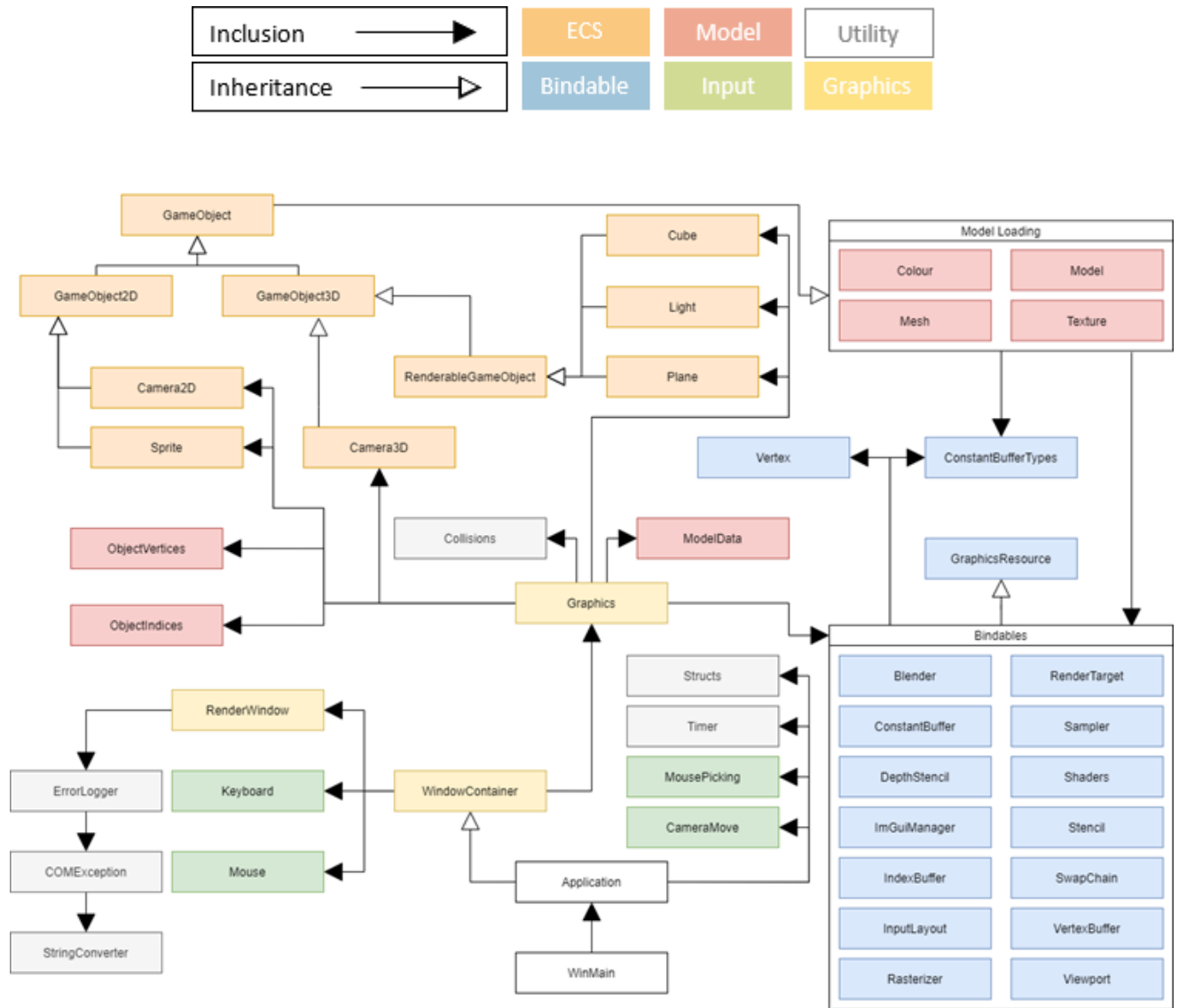
- Catching Exceptions:

```
catch ( COMException& exception )  
{  
    ...  
    ErrorLogger::Log( exception );  
    return false;  
}
```

ImGui

- GitHub Repository - <https://github.com/ocornut/imgui>
- An introduction to the Dear ImGui library - <https://blog.conan.io/2019/06/26/An-introduction-to-the-Dear-ImGui-library.html>

Class Diagram



Some classes are still not accounted for; however, the general layout for the system architecture still applies. May add these later.

Minutes of Meetings

Week	Date	Attendees	Absent	Discussion
1	21/01/2021	<ul style="list-style-type: none"> • Kyle • Ben • Thomas • Jacob 	<ul style="list-style-type: none"> • Daniel • Lorcan 	<ul style="list-style-type: none"> • Team Name • Game Theme • Design Aspects • Game Elements
2	28/01/2021	<ul style="list-style-type: none"> • Kyle • Ben • Thomas • Jacob • Daniel • Lorcan 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Game Mechanics (Multi-Tool affecting properties of objects) • Game Theme (Alien Technology/ Subnautica style Alien design) • Tasks for next week <ul style="list-style-type: none"> ○ Create JSON loader ○ Get models loading ○ Make mood boards ○ Find asset packs ○ Find good sounds/ decide sound design
3	04/02/2021	<ul style="list-style-type: none"> • Kyle • Ben • Thomas • Jacob • Daniel 	<ul style="list-style-type: none"> • Lorcan 	<ul style="list-style-type: none"> • Presentation • Ideas / level design • Puzzle Design • Multi-Tool Abilities • Tasks for next week <ul style="list-style-type: none"> ○ Prototype of Multi-Tool ○ Start to build up the scene ○ Abstract framework components for easier use
4	11/02/2021	<ul style="list-style-type: none"> • Kyle • Ben • Thomas • Jacob • Daniel 	<ul style="list-style-type: none"> • Lorcan 	<ul style="list-style-type: none"> • Prototypes / playground • Physics • General Puzzle layouts • Multi-tool abstraction • Presentations
5	18/02/2021	<ul style="list-style-type: none"> • Kyle • Ben • Thomas • Jacob • Daniel 	<ul style="list-style-type: none"> • Lorcan 	<ul style="list-style-type: none"> • Input abstraction • Modelling some prototypes of tutorial • Physics cont. • Refactoring graphics class
6	25/02/2021	<ul style="list-style-type: none"> • Kyle • Ben • Thomas • Jacob • Daniel 	<ul style="list-style-type: none"> • Lorcan 	<ul style="list-style-type: none"> • Camera reworking • Cube collisions w/ pressure plate • 3D sound implementation • UI design

7	04/03/2021	<ul style="list-style-type: none"> • Kyle • Ben • Thomas • Jacob • Daniel • Lorcan 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Ability to change cube material/properties - physics should reflect this (bounciness, weight etc.)
8		<ul style="list-style-type: none"> • Kyle • Ben • Thomas • Jacob • Daniel • Lorcan 	<ul style="list-style-type: none"> • None 	
9		<ul style="list-style-type: none"> • Kyle • Ben • Thomas • Jacob • Daniel • Lorcan 	<ul style="list-style-type: none"> • None 	

Development Log

Week	Date (Week Starting)	Systems Developed/Implemented (In Given Week)
1	21/01/2021	<ul style="list-style-type: none">• Window Creation• Keyboard/Mouse Input• Primitive Object Loading• Basic Texturing• ImGui Implementation• Font Rendering
2	28/01/2021	<ul style="list-style-type: none">• Model Loading/Texturing• Dynamic Point Lighting• Camera Movement• Entity-Component System
3	04/02/2021	<ul style="list-style-type: none">• Multi-tool prototype• Framework components abstracted
4	11/02/2021	<ul style="list-style-type: none">• Hub room created• Simple physics system implemented
5	18/02/2021	<ul style="list-style-type: none">• Physics System cont.• Input Class• Sound Manager Started
6	25/02/2021	<ul style="list-style-type: none">• Refactoring graphics class cont.• UI designs• Sound cont.
7	04/03/2021	<ul style="list-style-type: none">• Cube vs. Pressure plate AABB collisions• Object creation abstraction• 3D sound
8	11/03/2021	