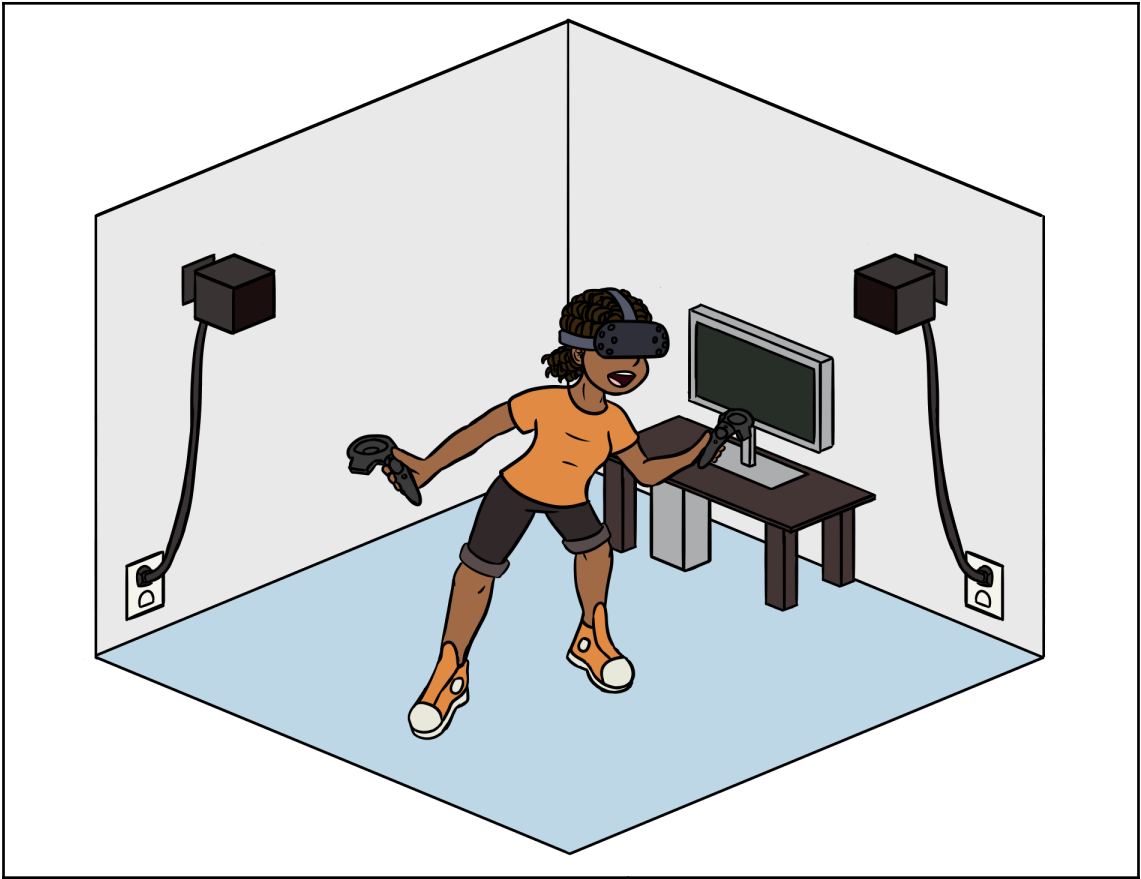


Chapter 1: Introducing VR Technology in Unreal Engine 4



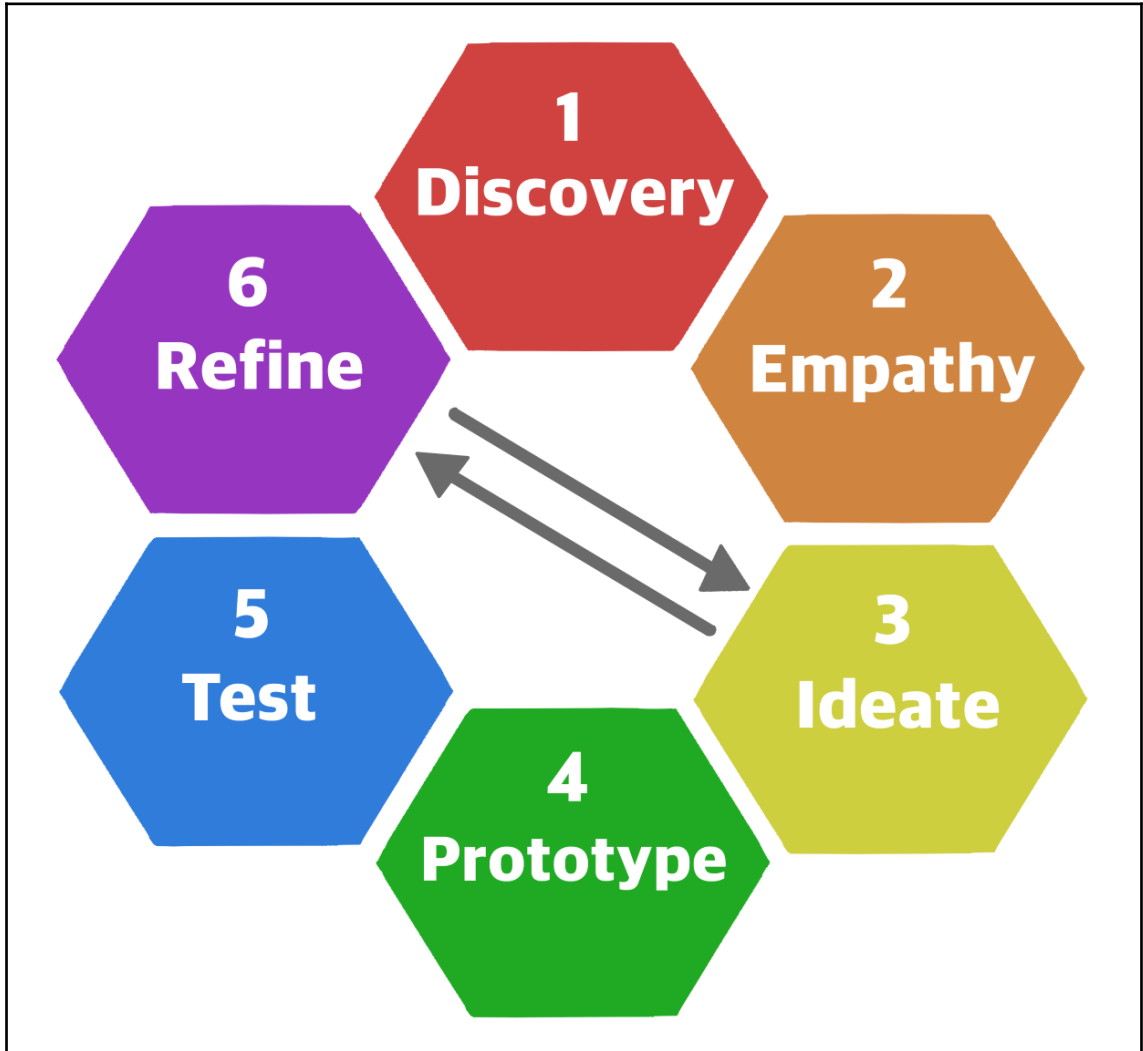




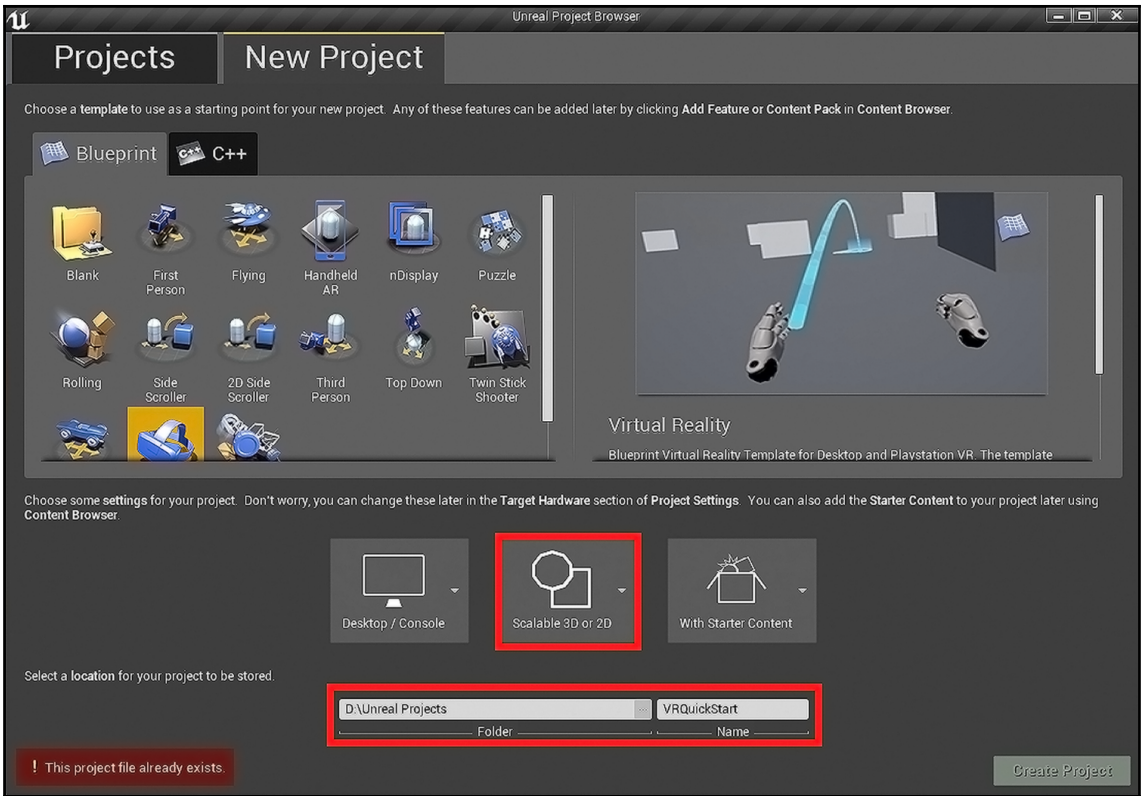


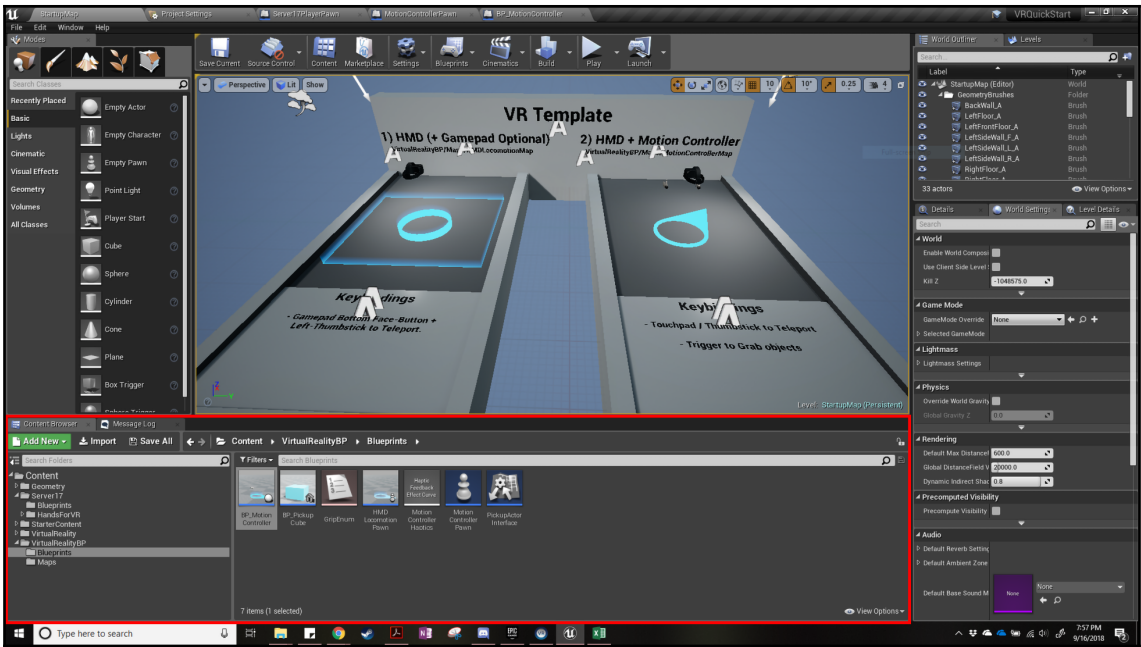
| HMD Device | Target Frame Rate |
|-------------|------------------------|
| DK1 | 60 FPS |
| DK2 | 75 FPS |
| Rift Retail | 90 FPS |
| Vive | 90 FPS |
| Gear VR | 60 FPS |
| PSVR | Variable up to 120 FPS |

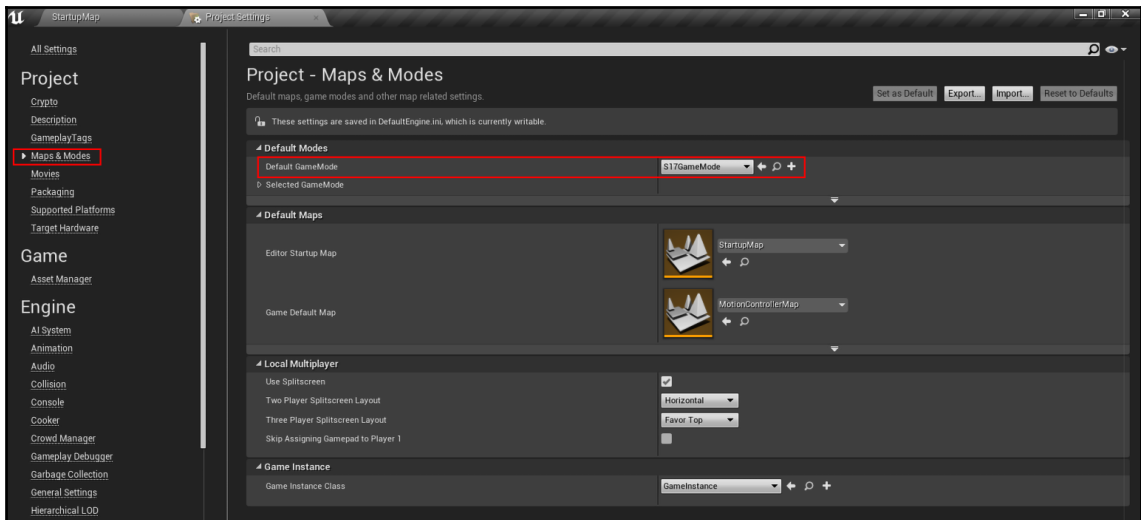
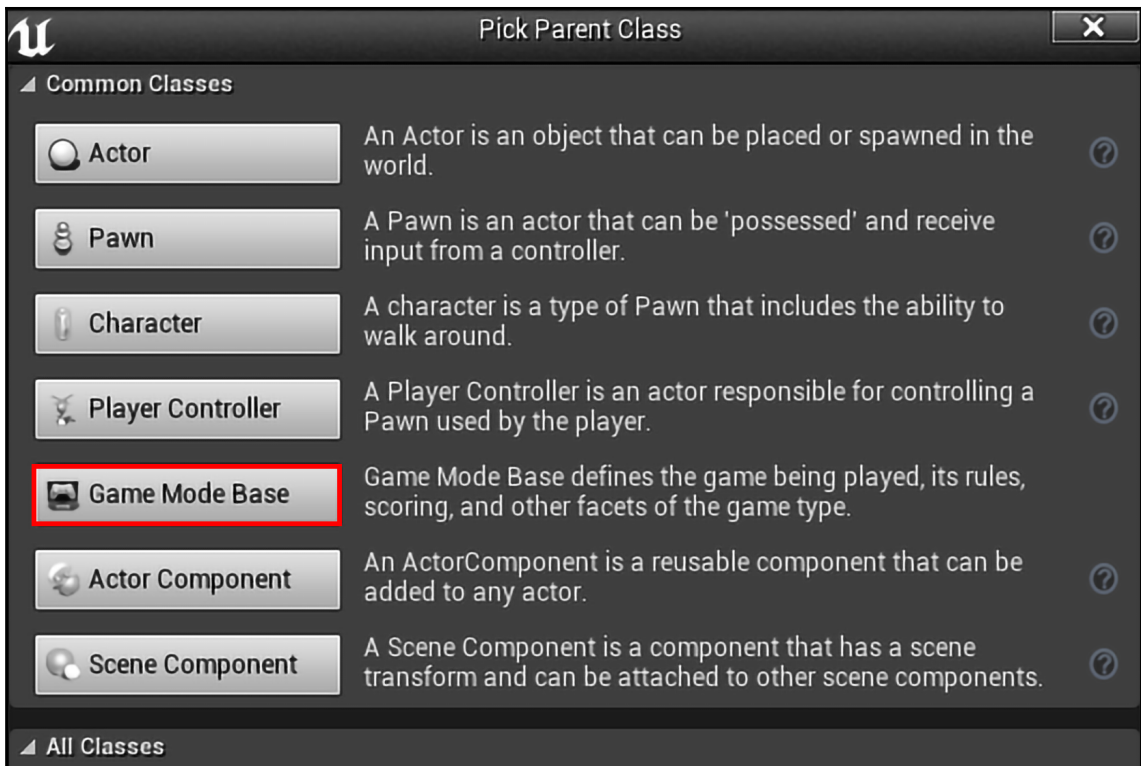
Chapter 2: Locomotion, Design, and Starting Our Project

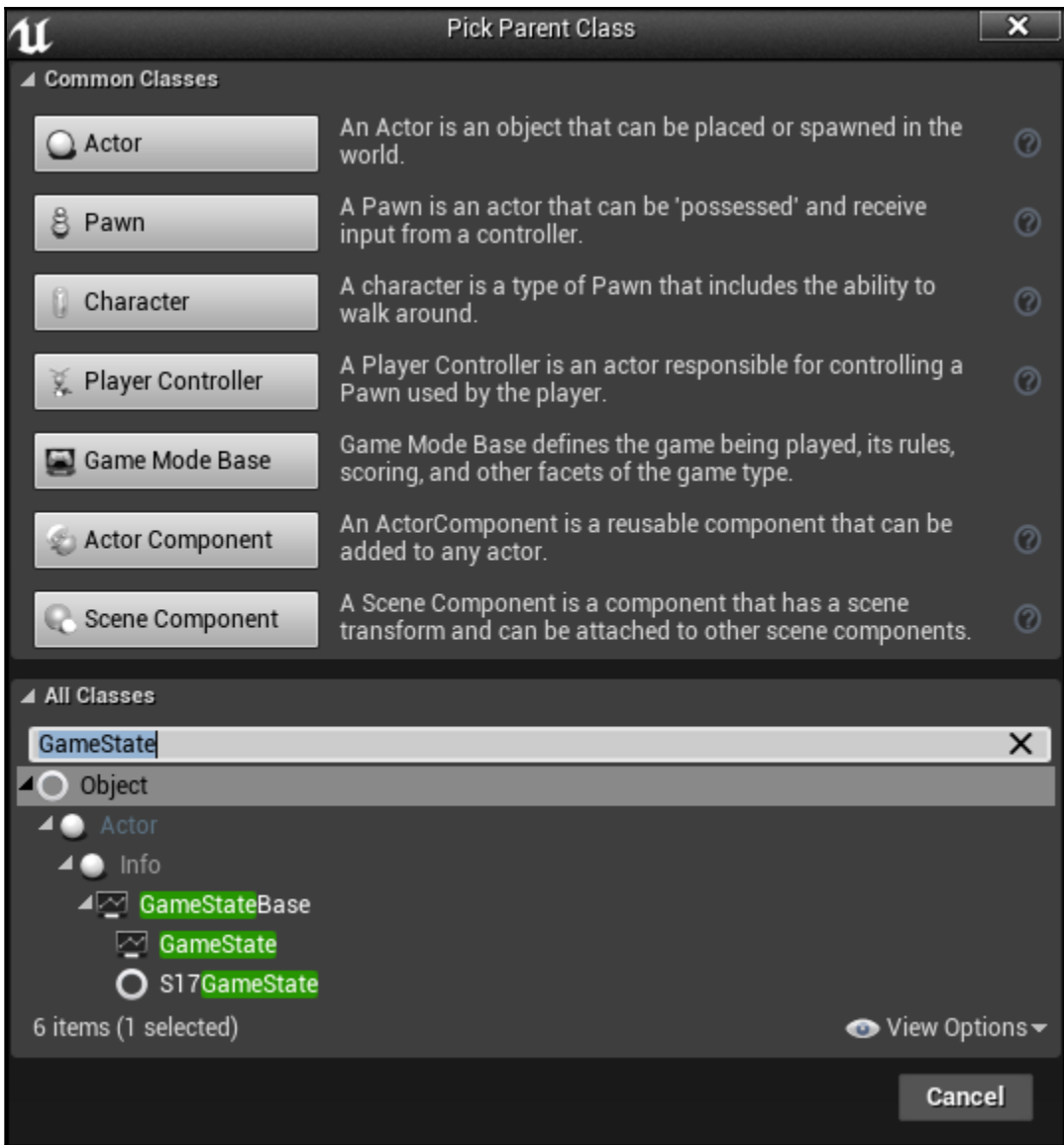


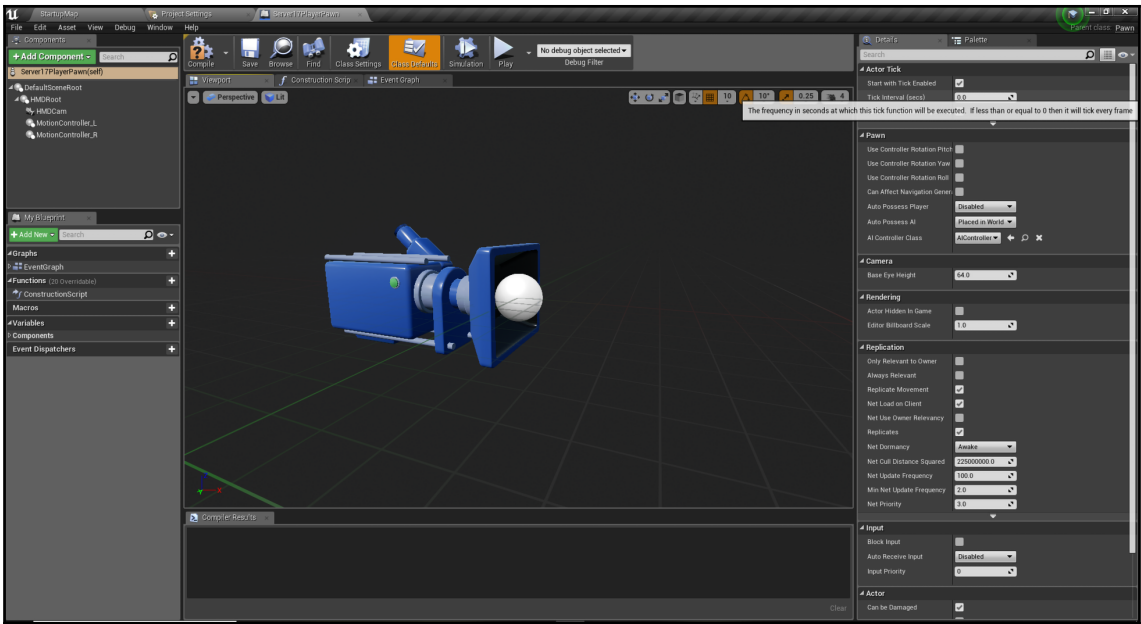


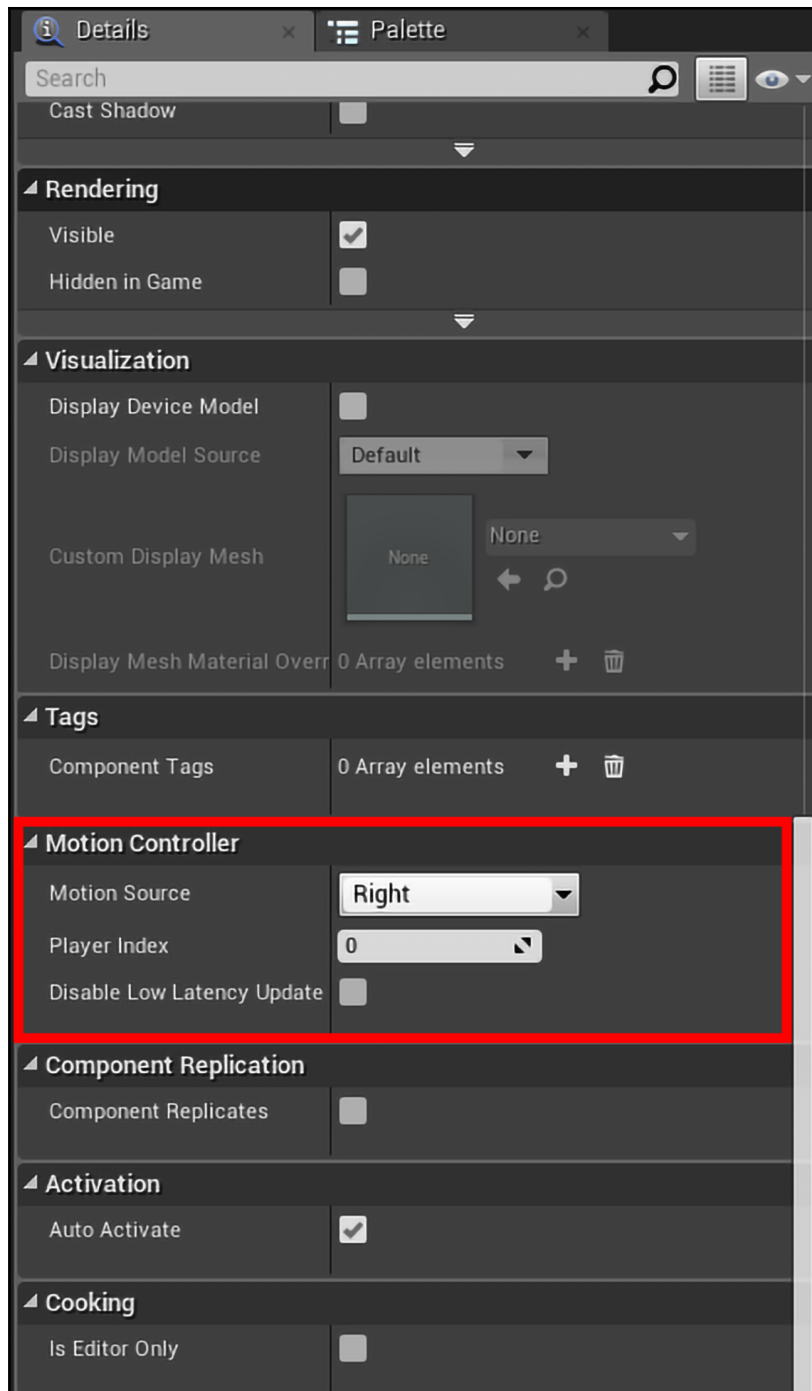


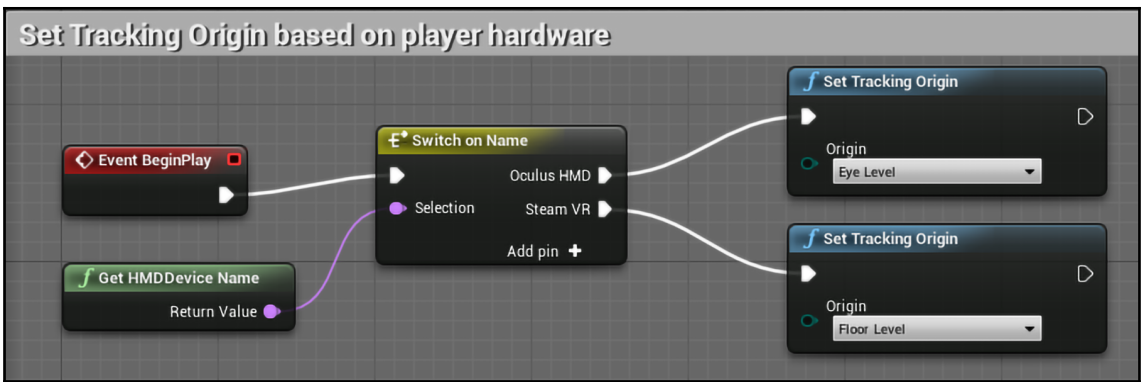




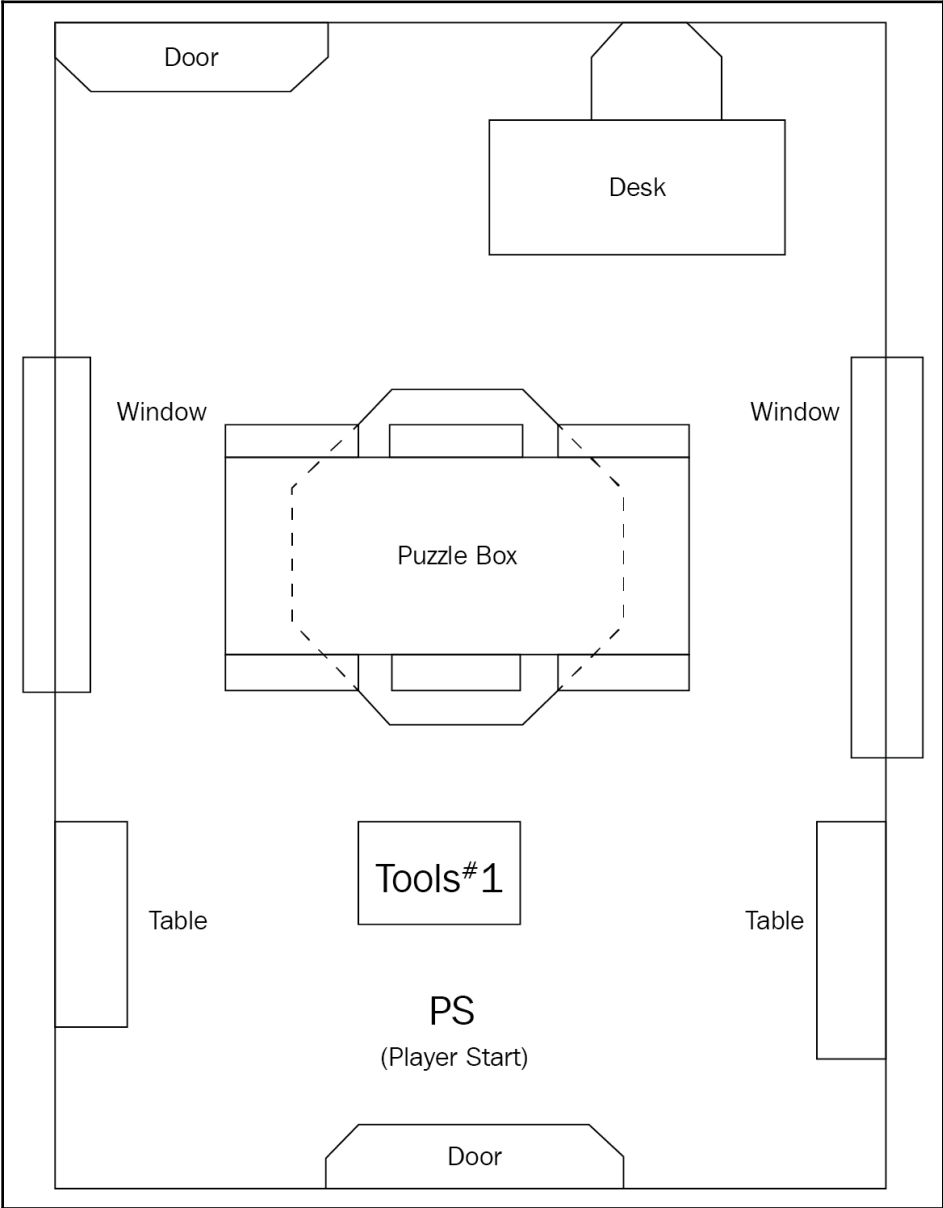


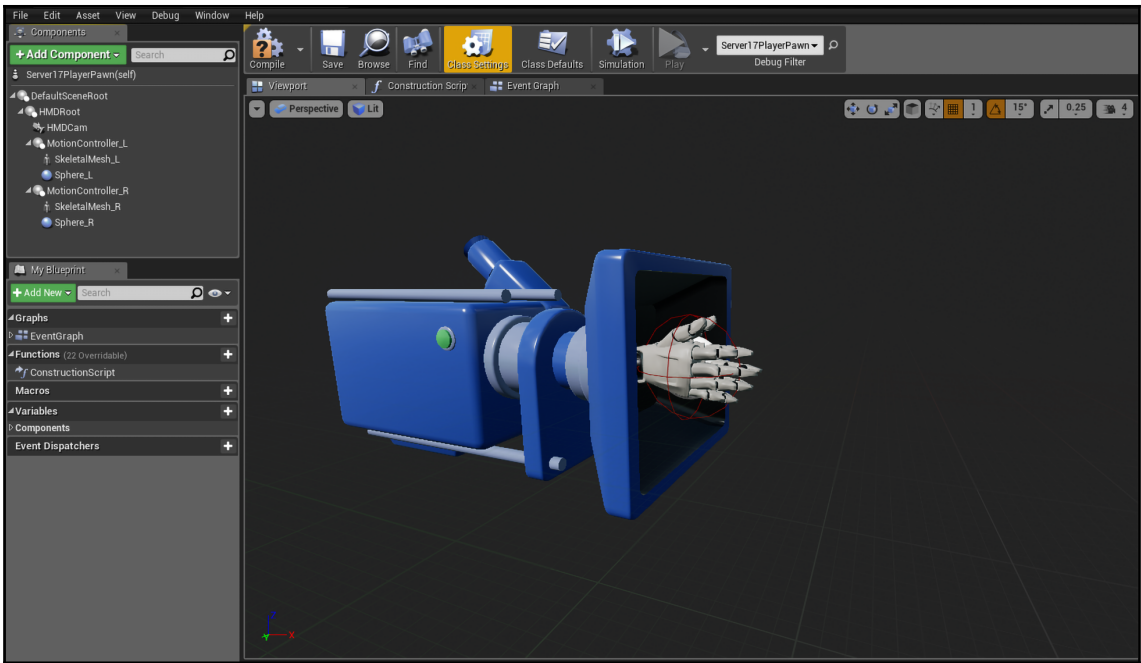


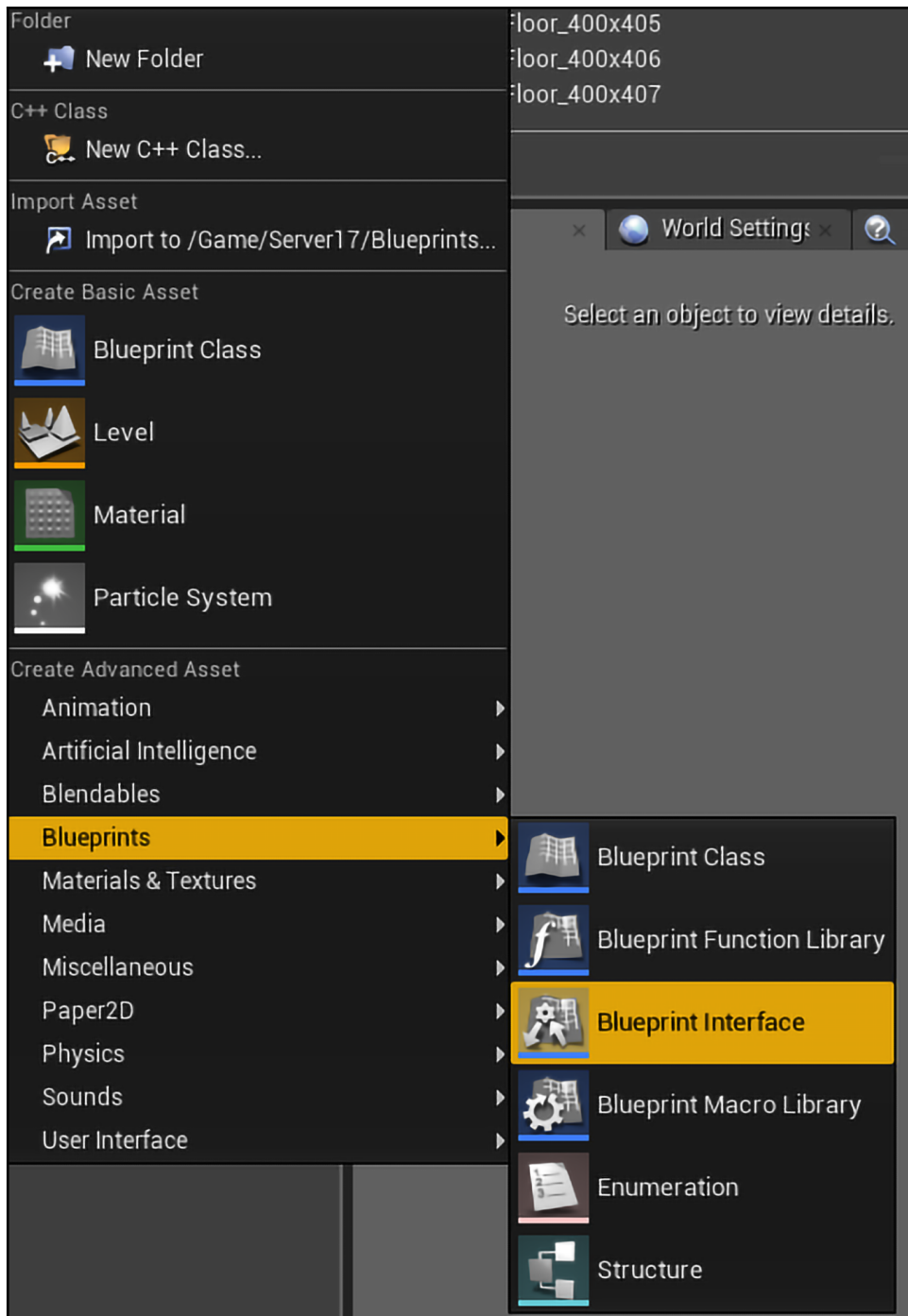


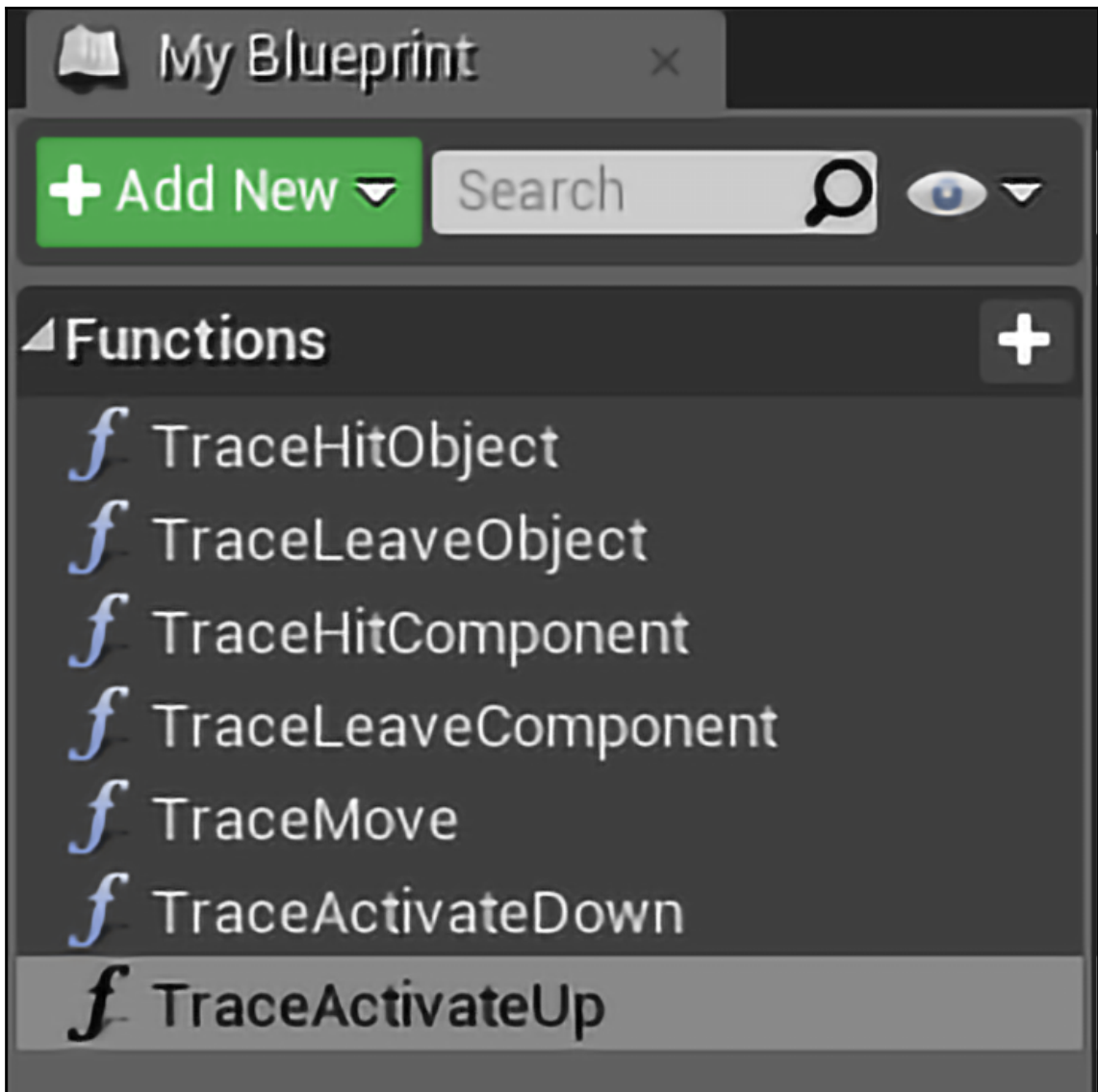


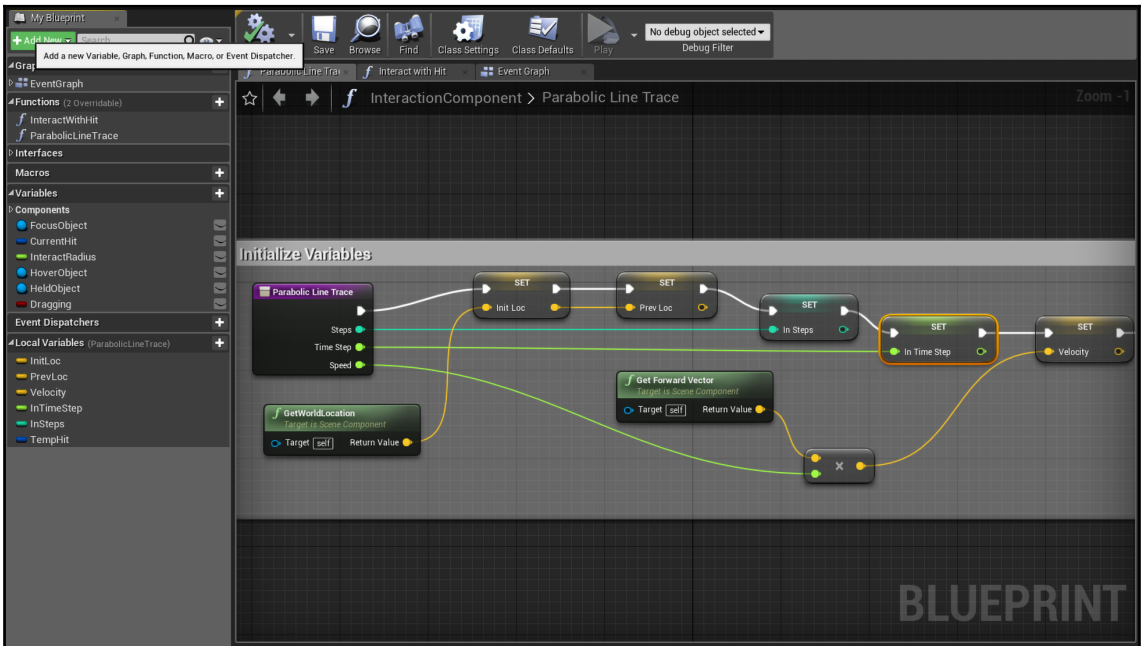
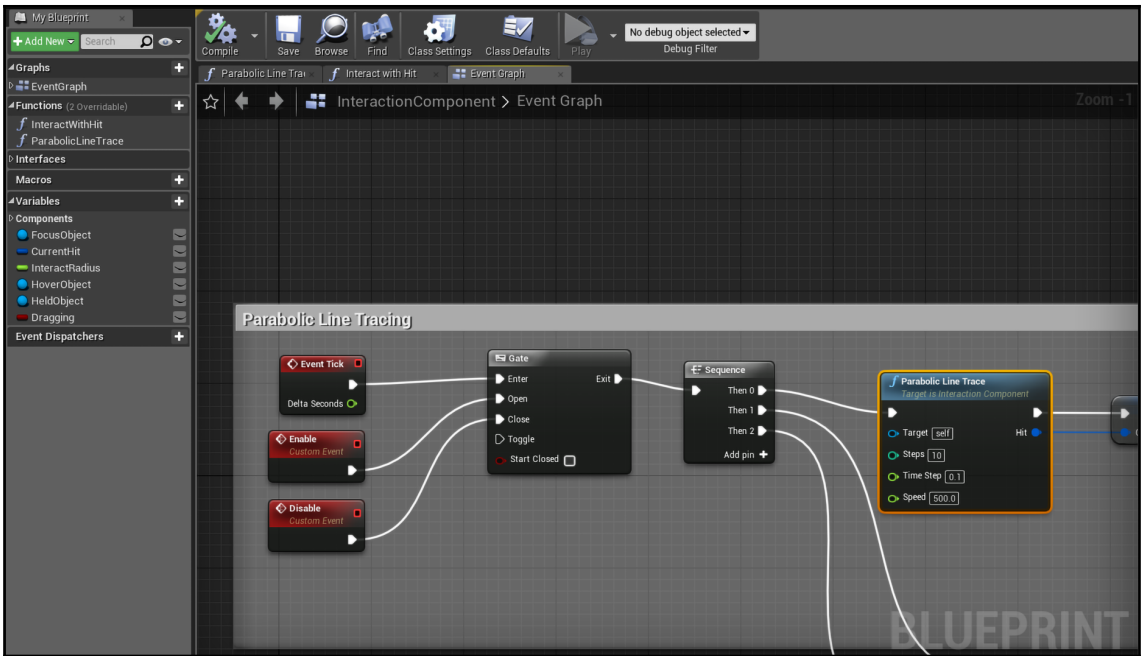
Chapter 3: Exploring Riveting Gameplay in Virtual Reality

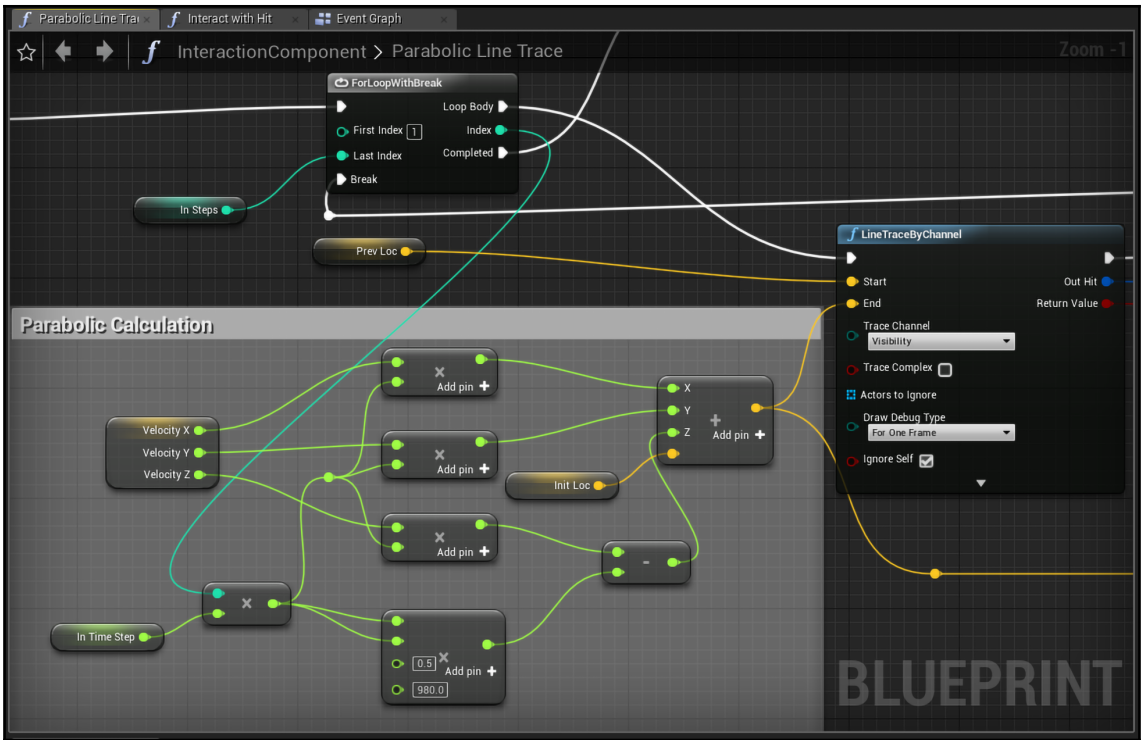


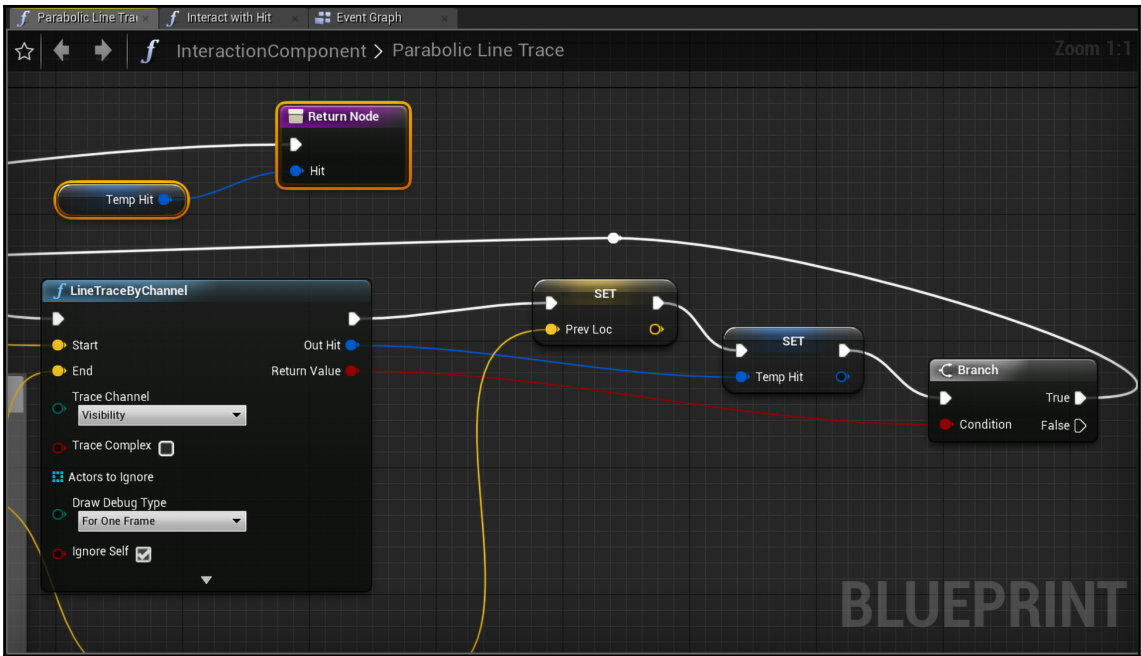


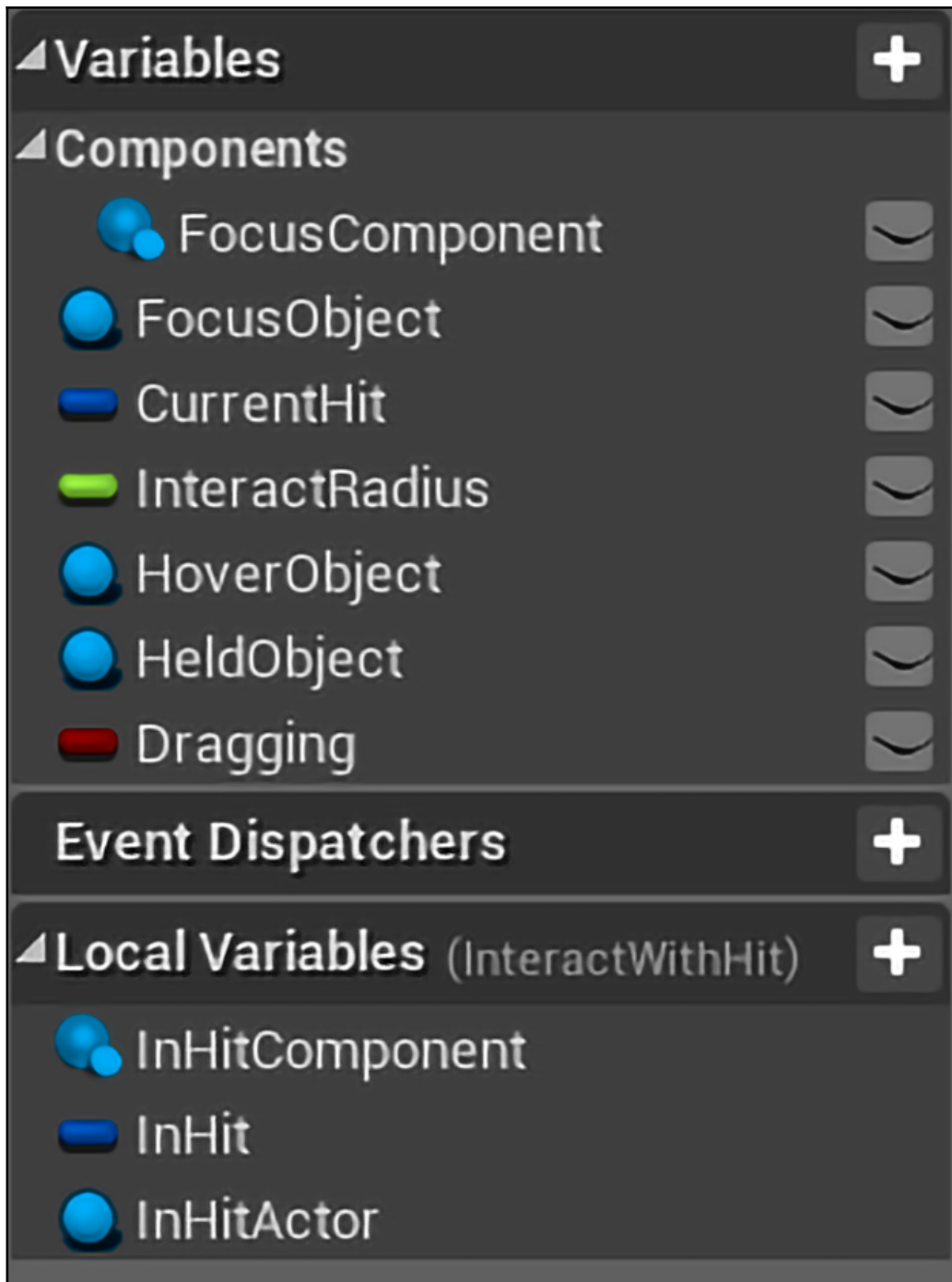


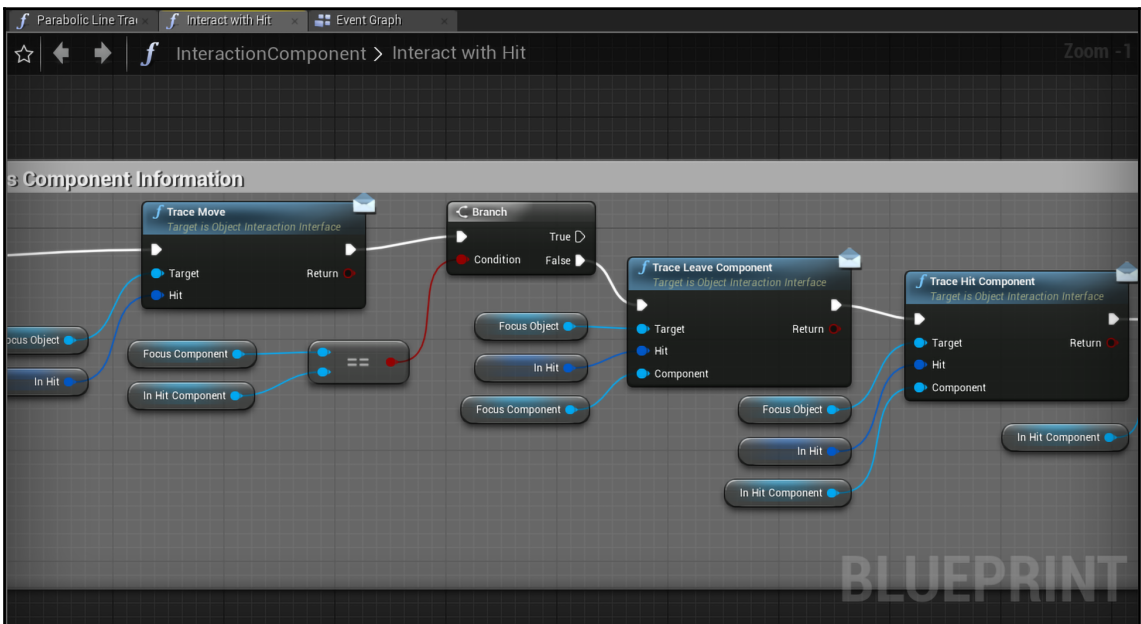
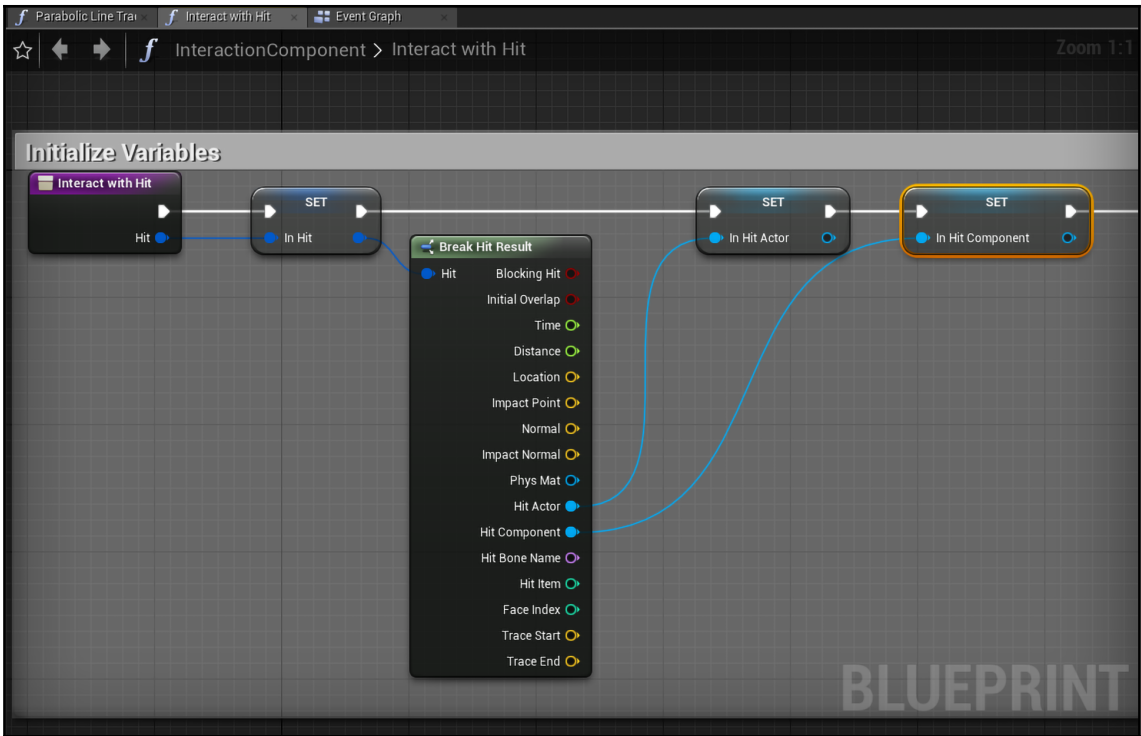


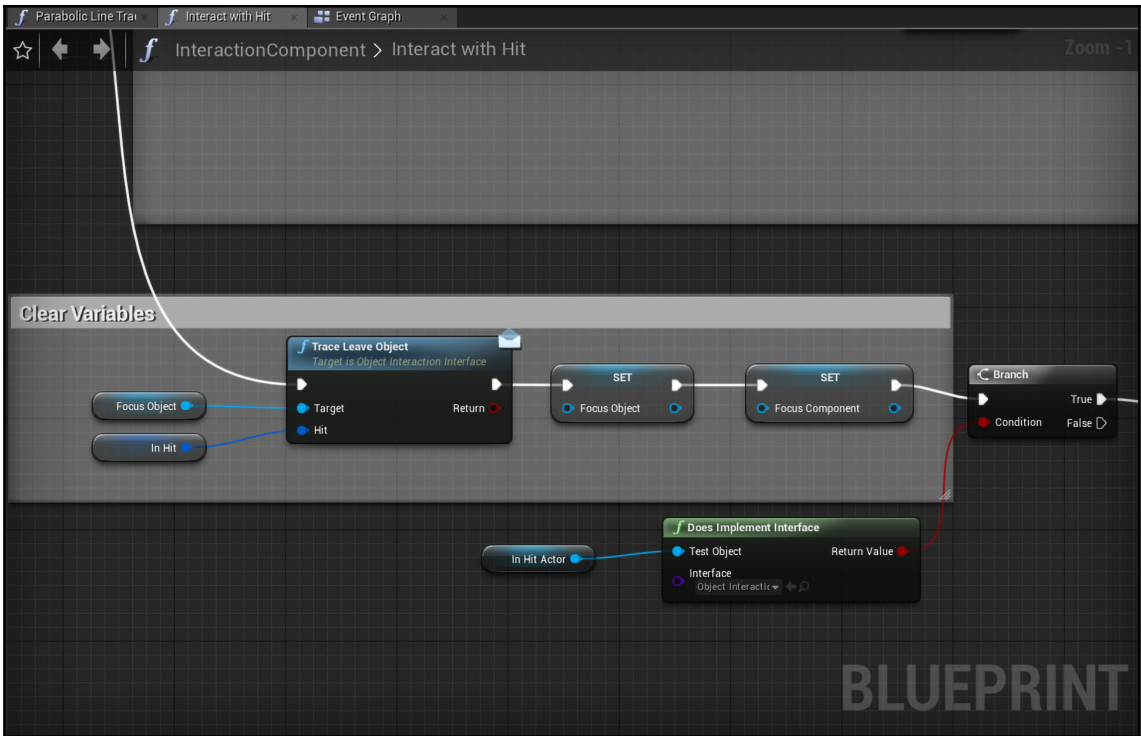


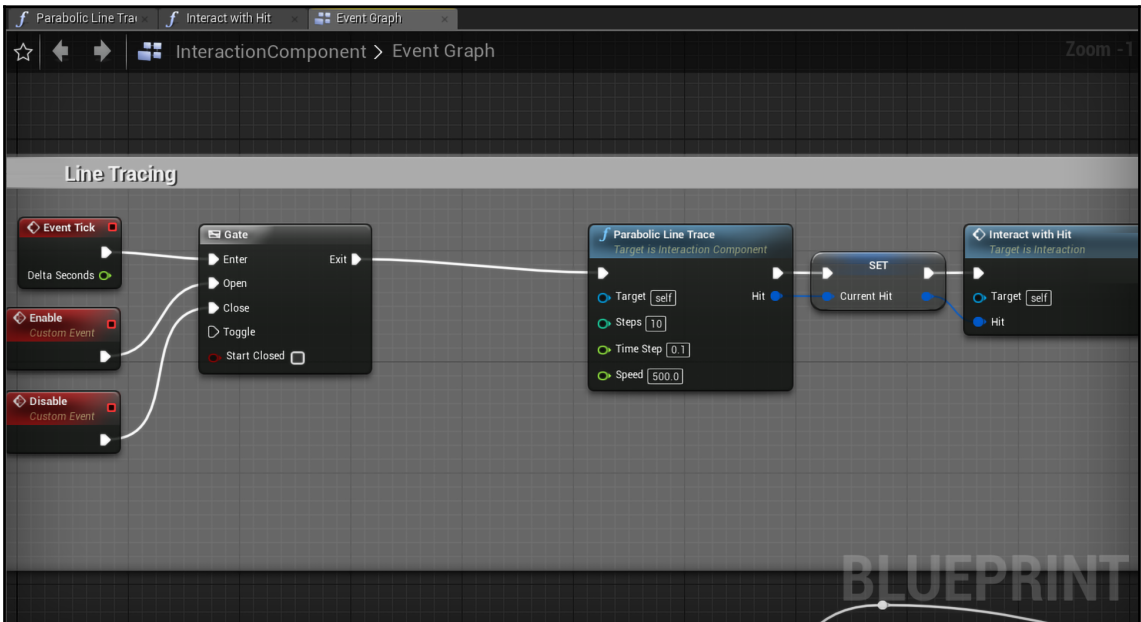
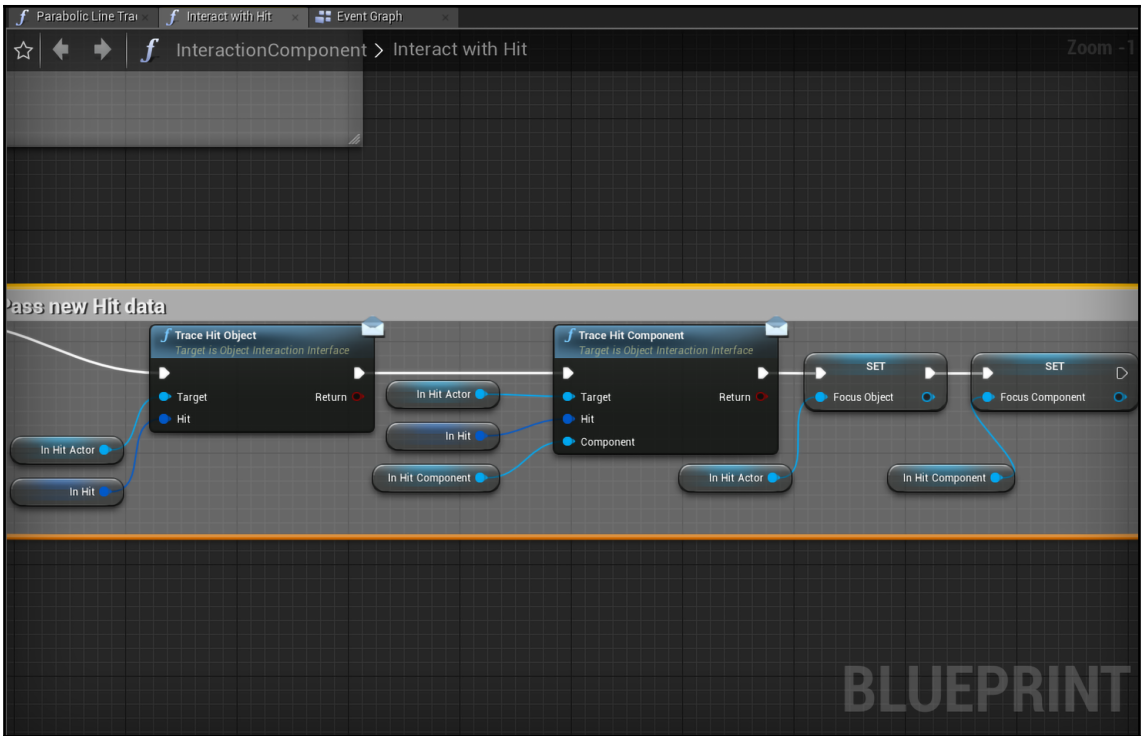


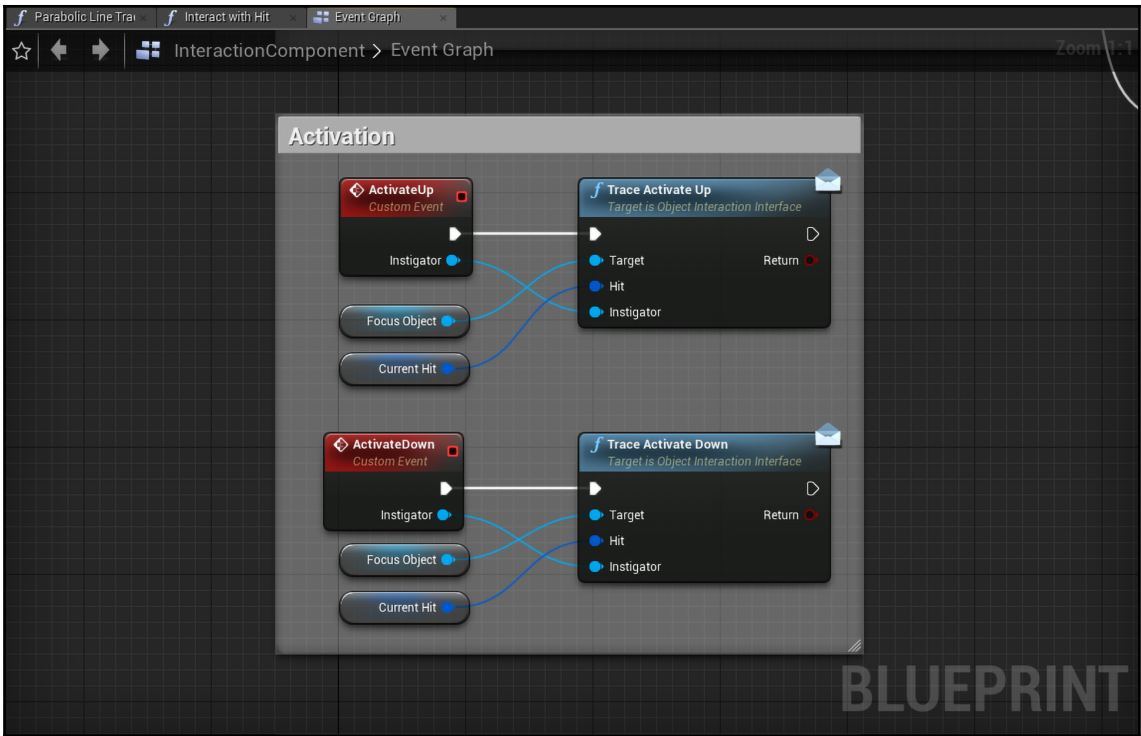


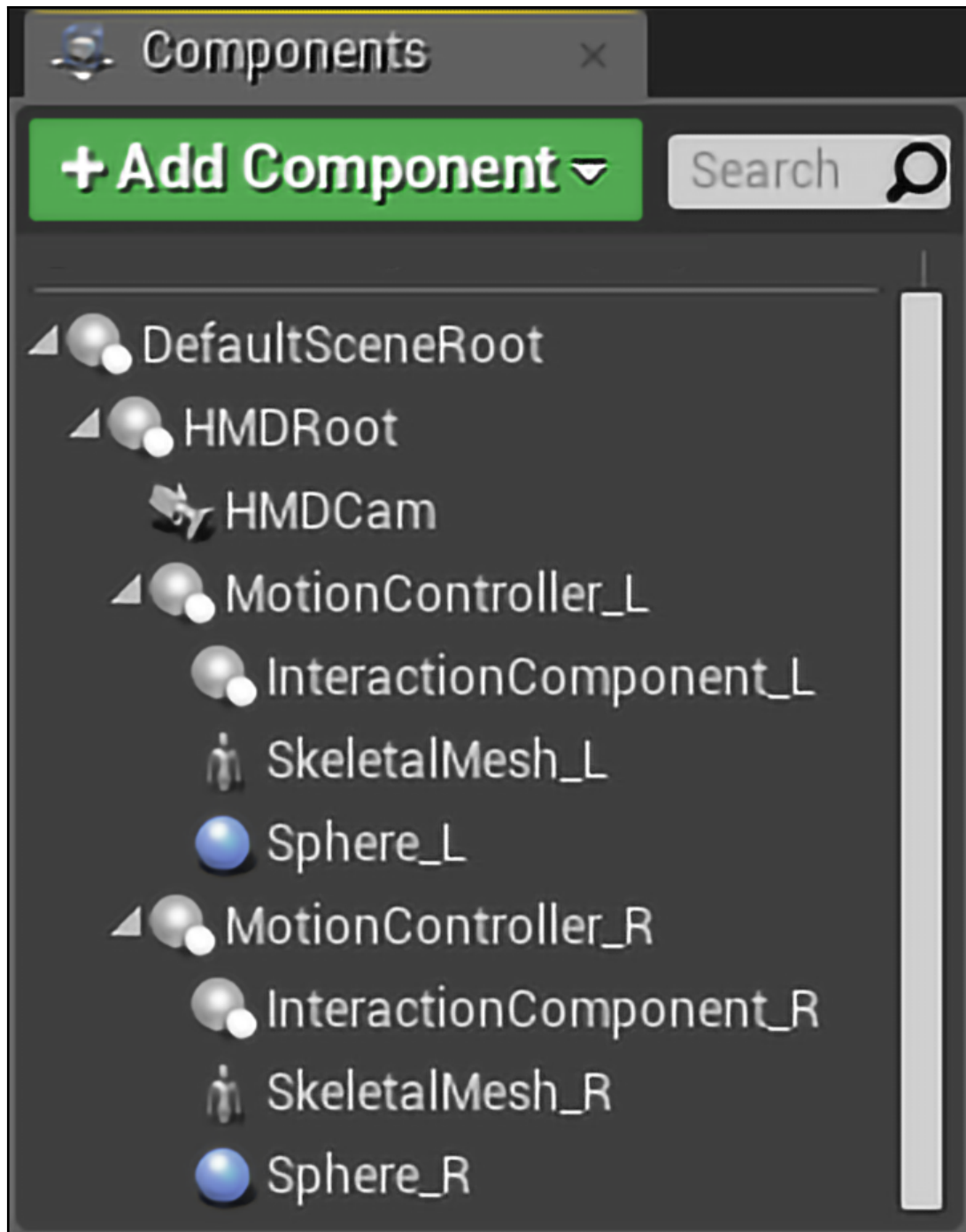


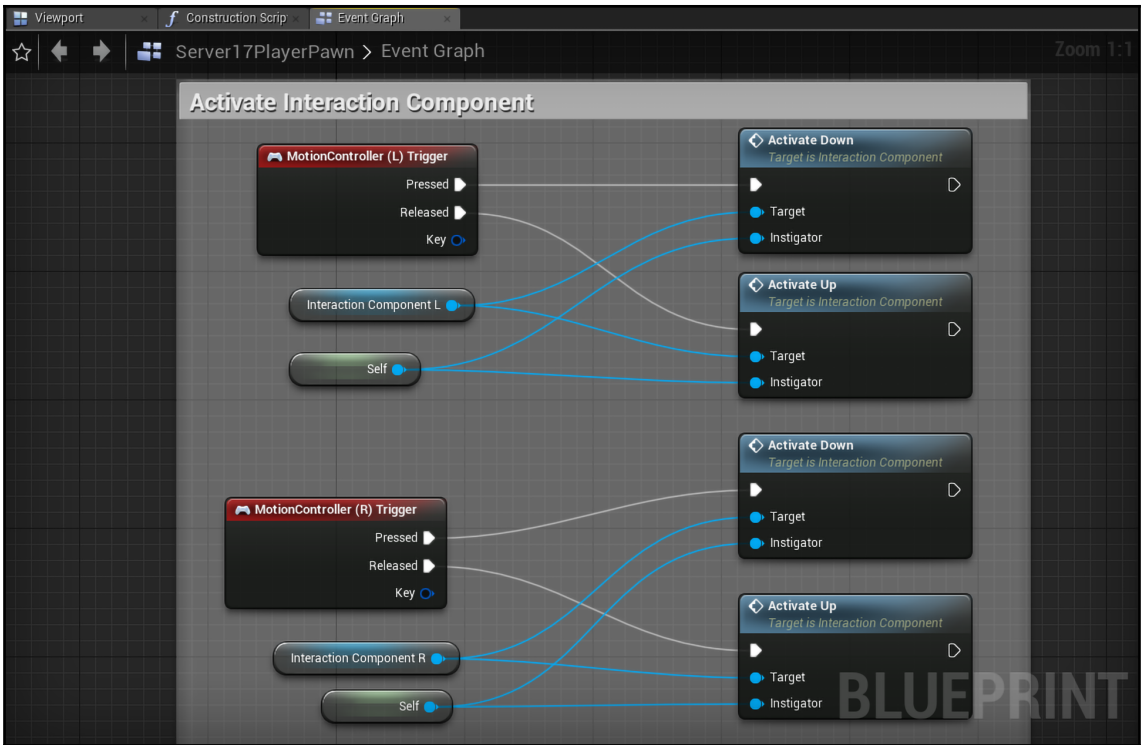


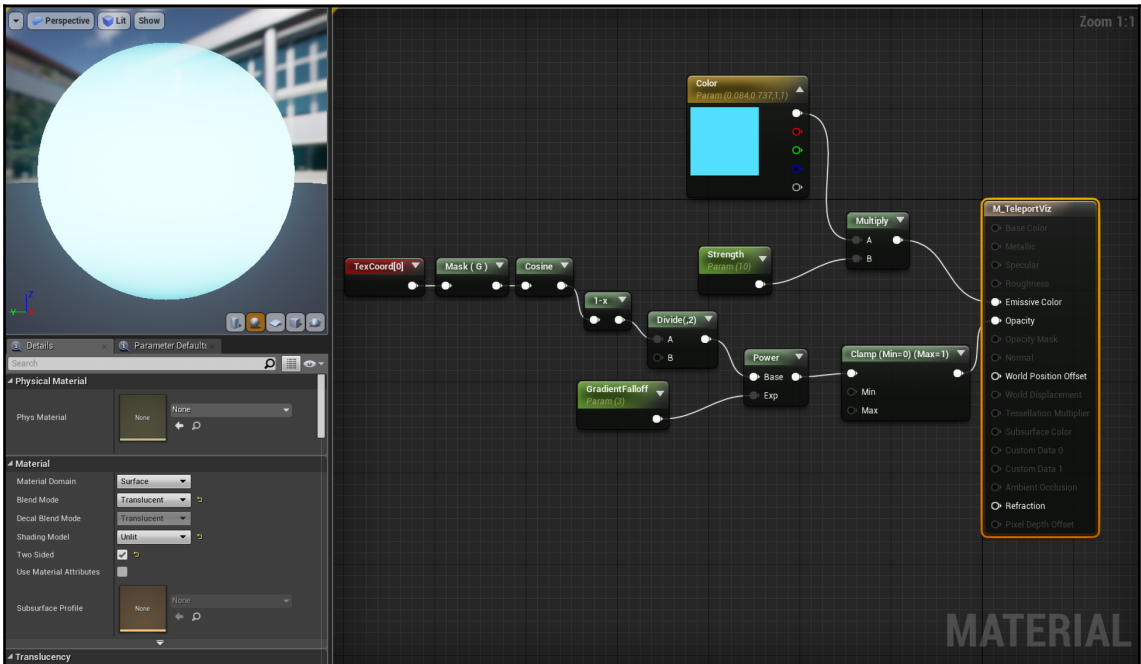
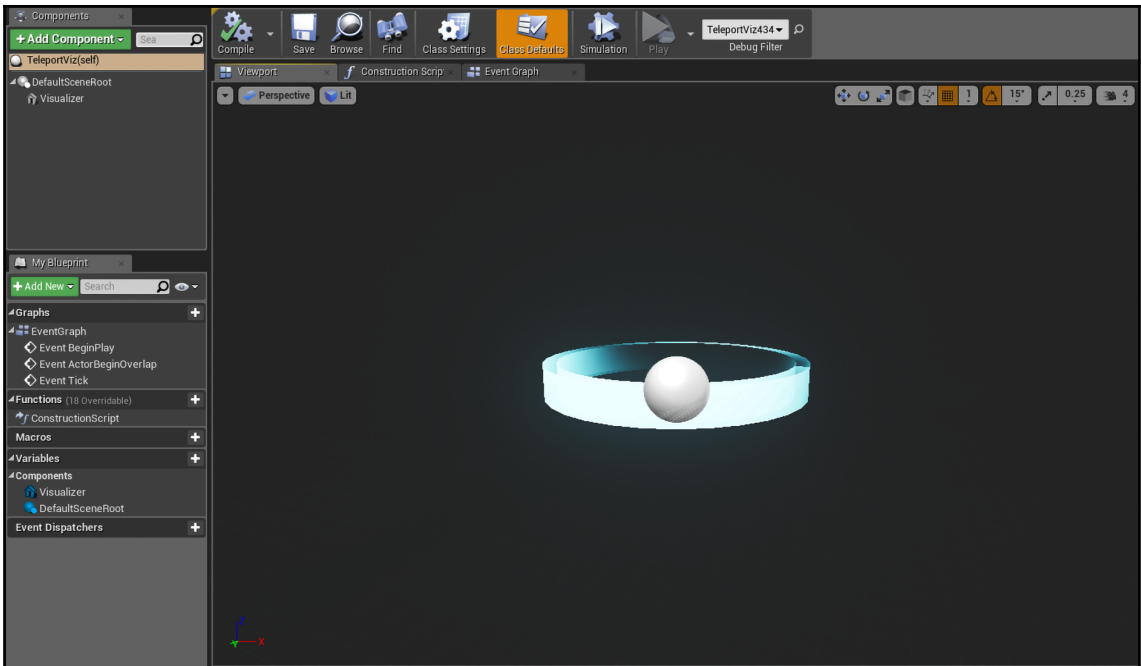


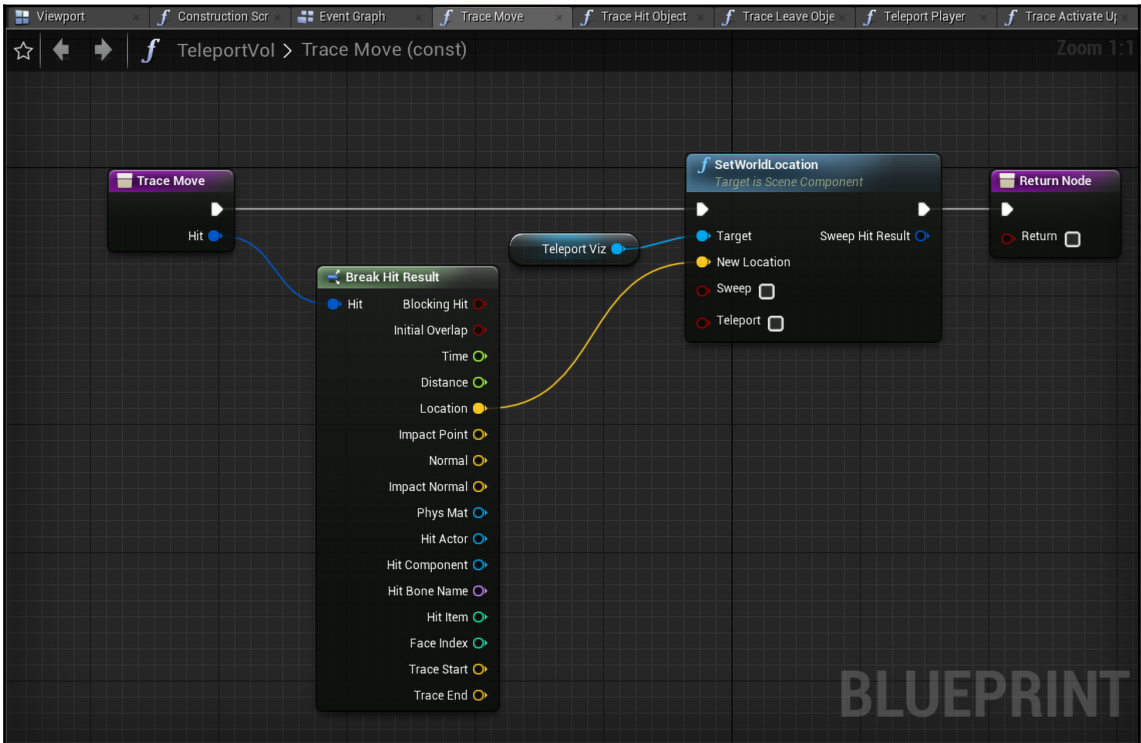
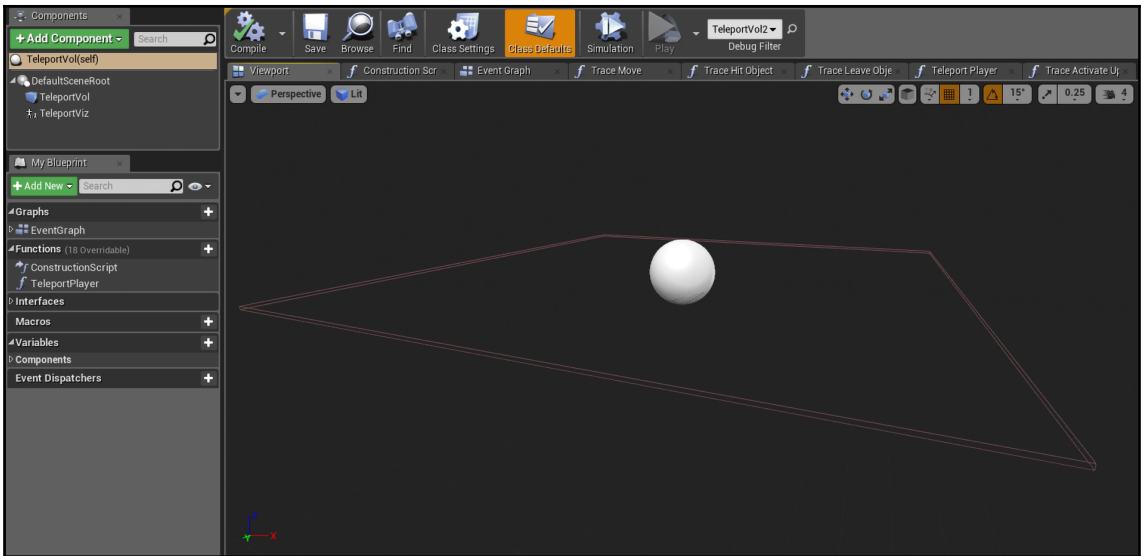


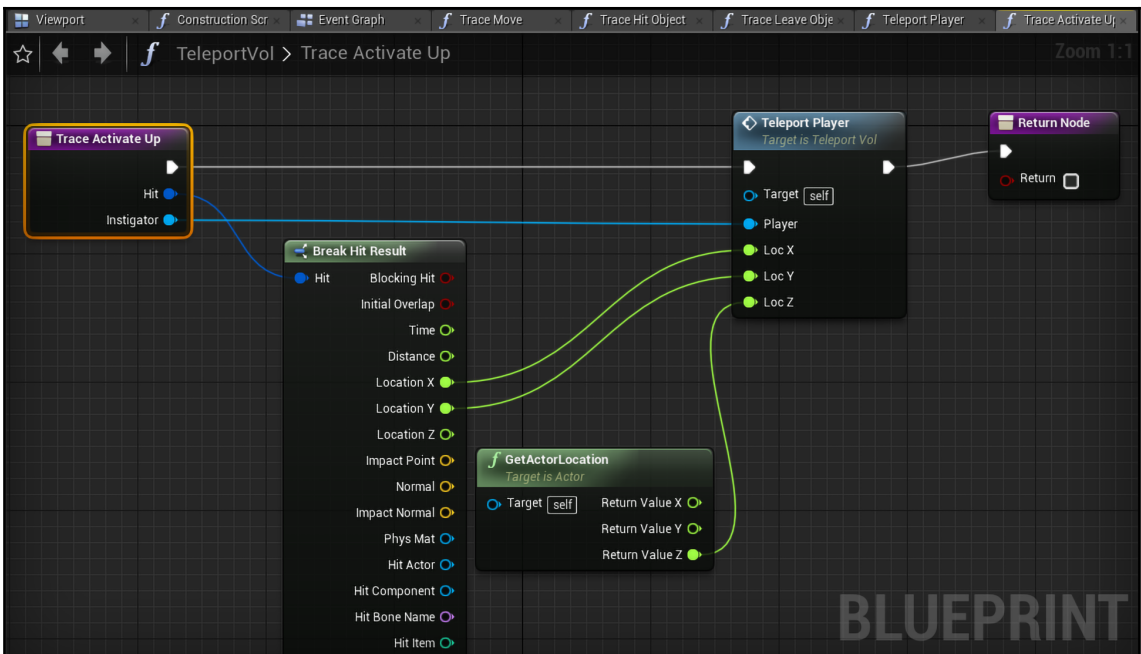
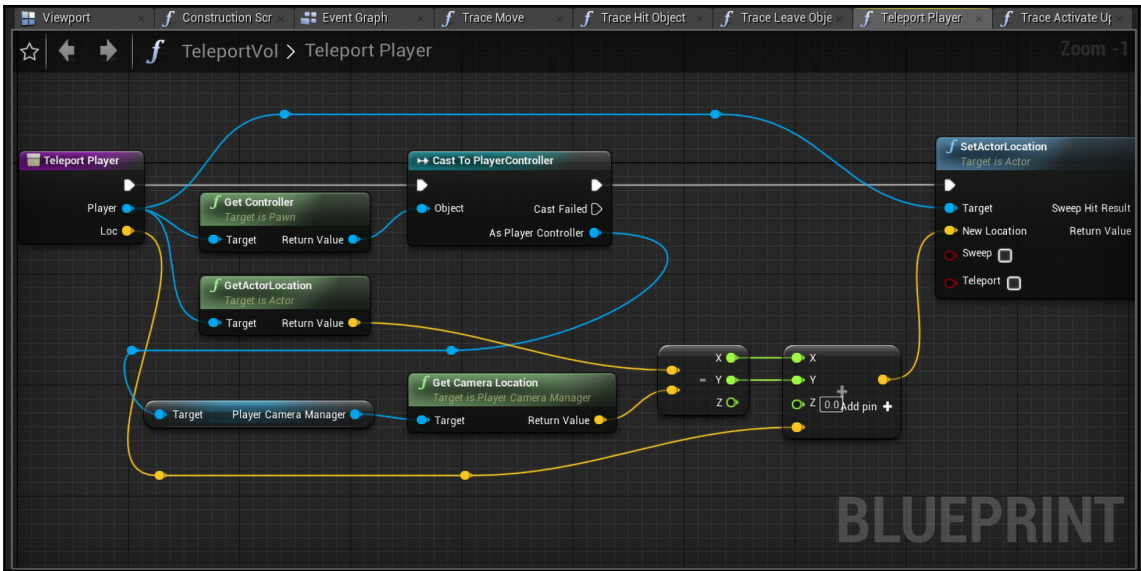


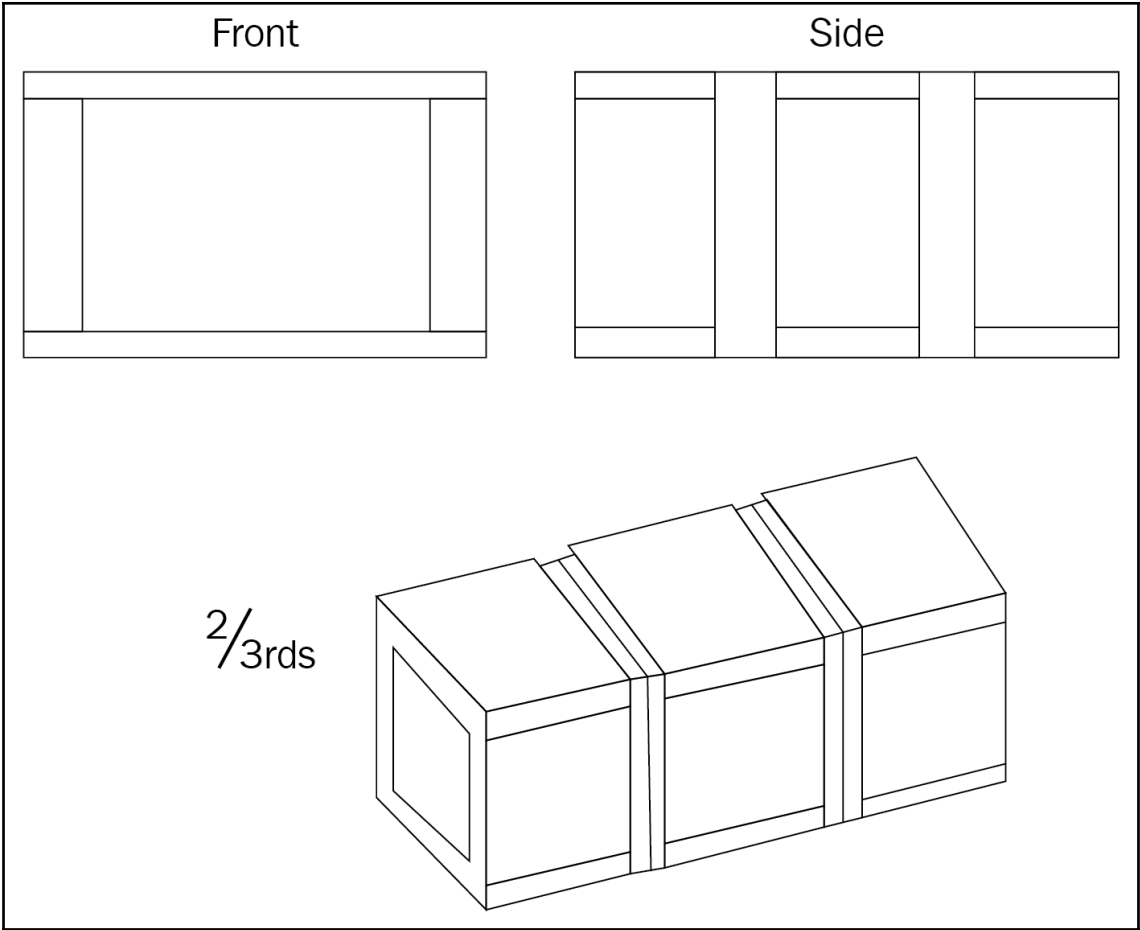


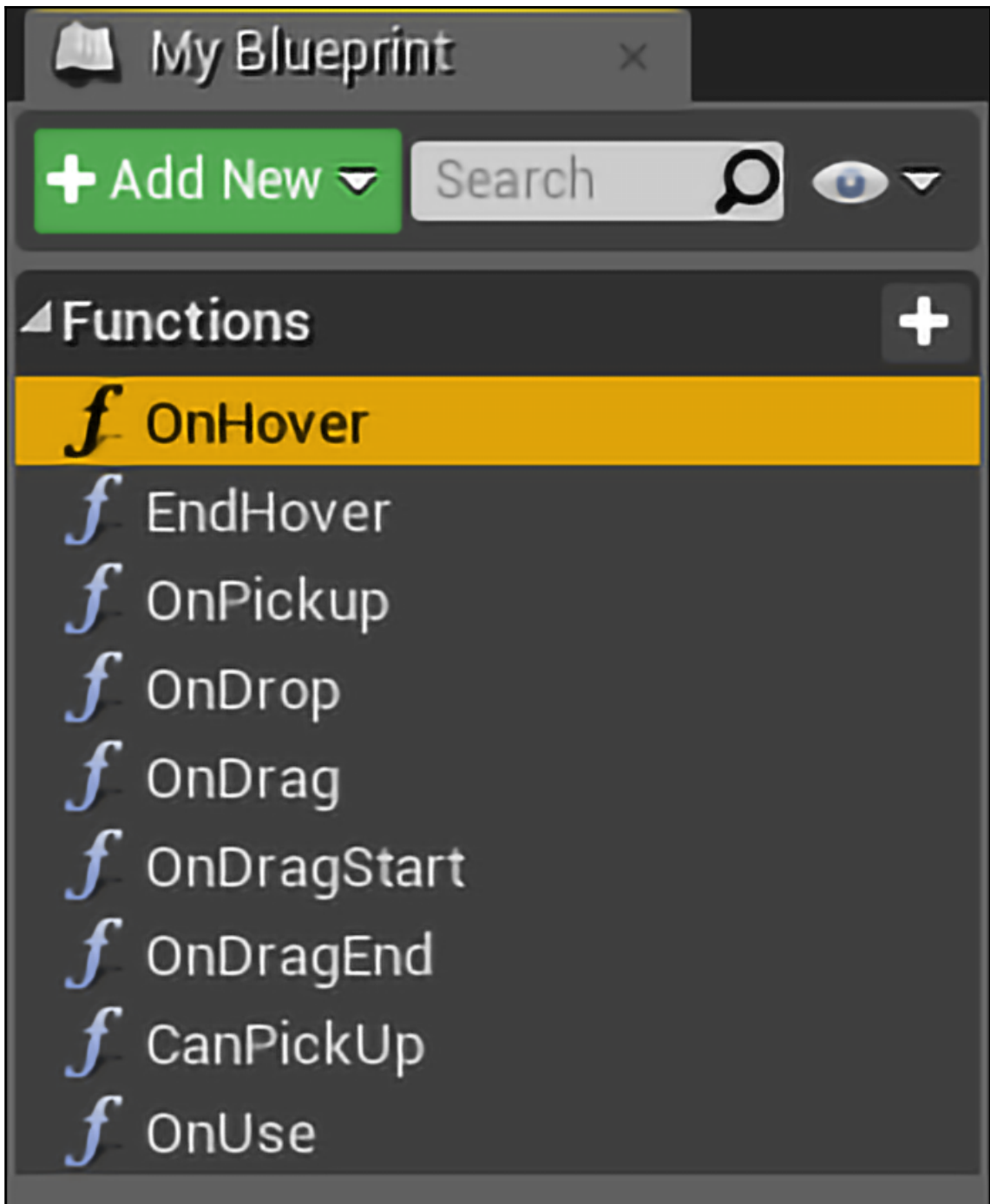


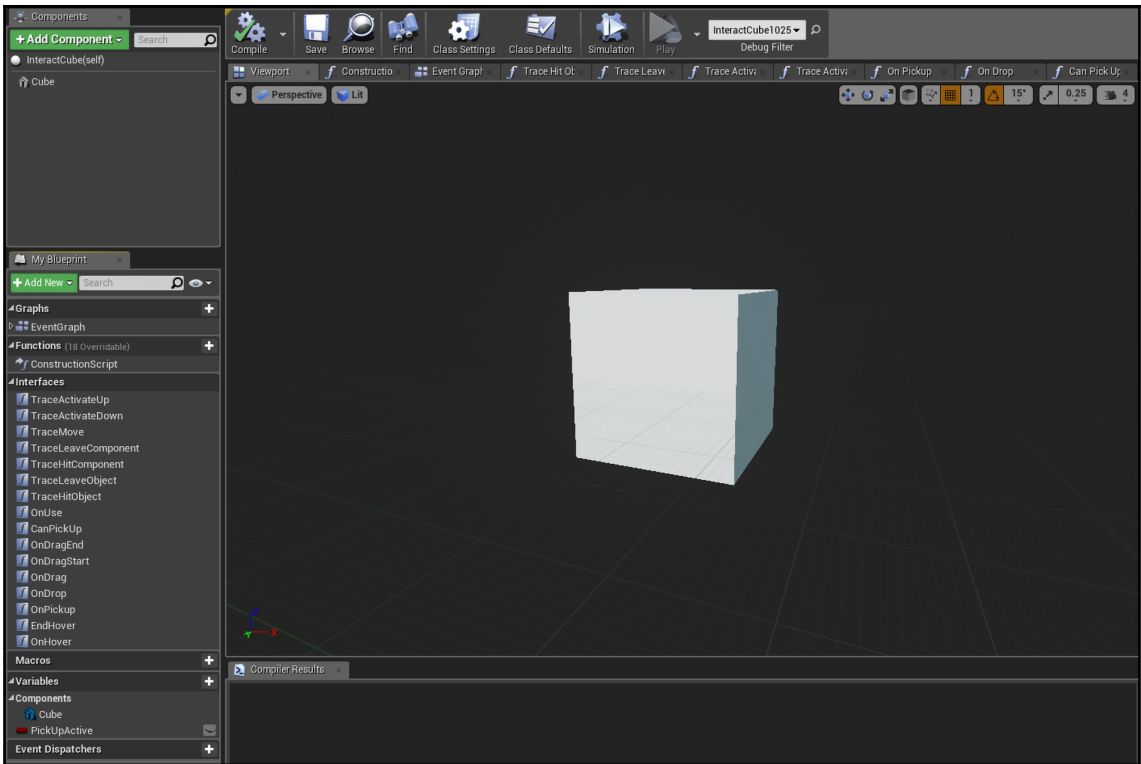


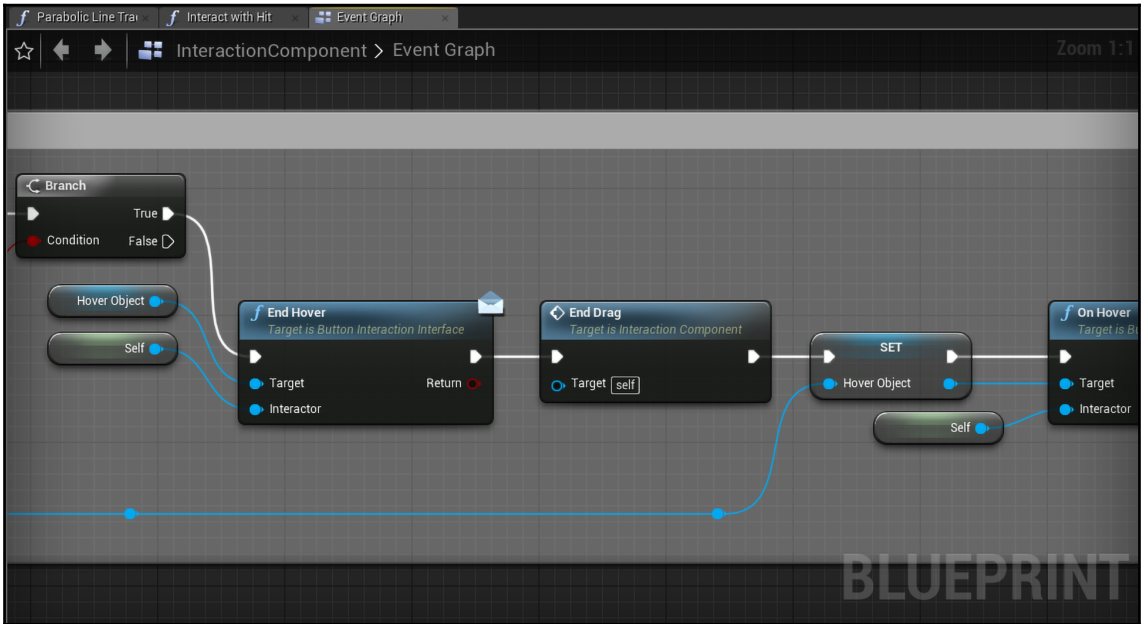
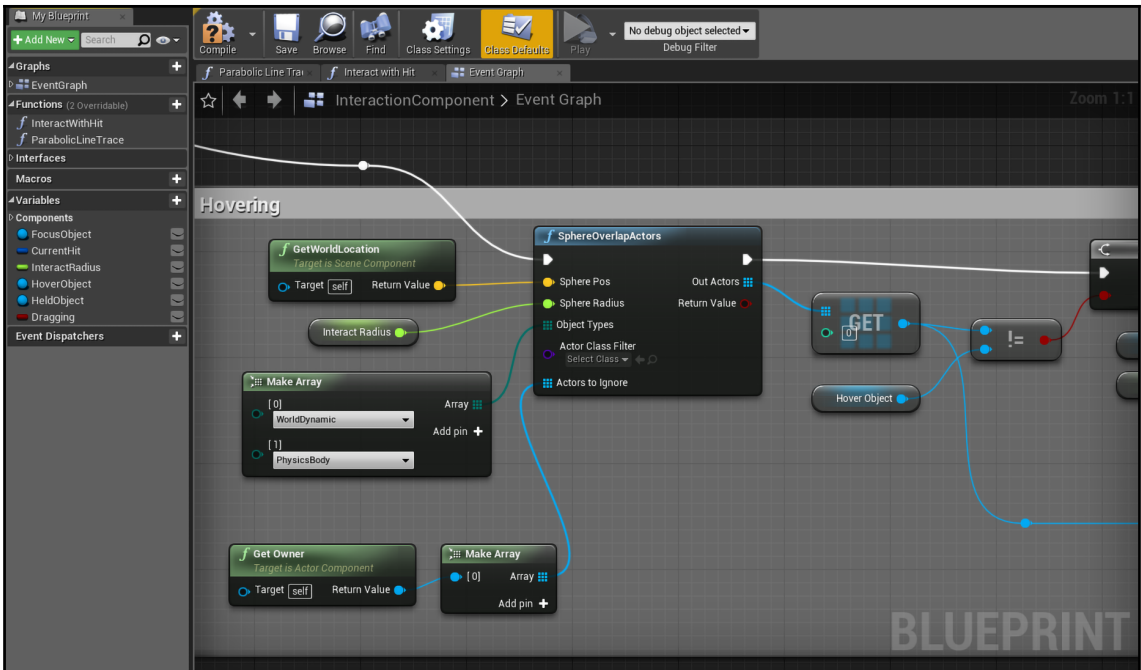


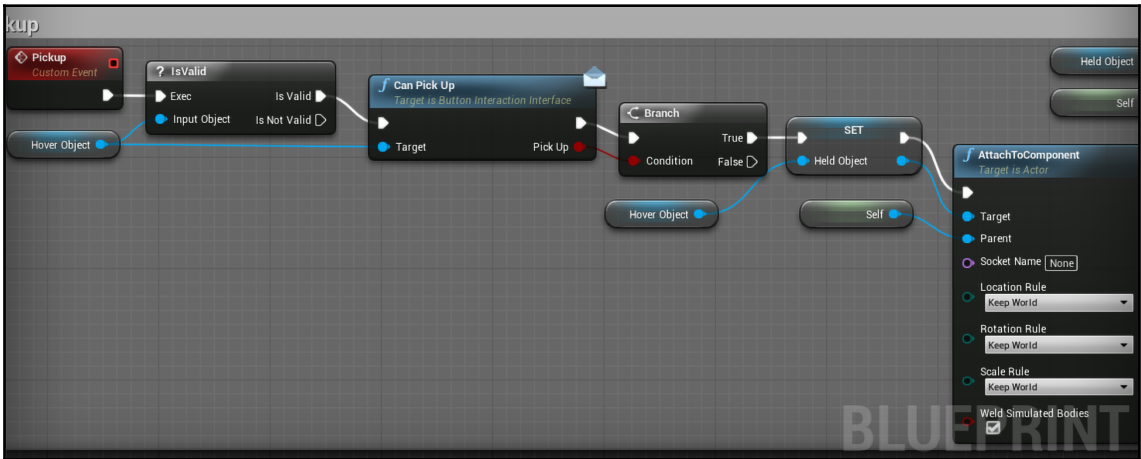
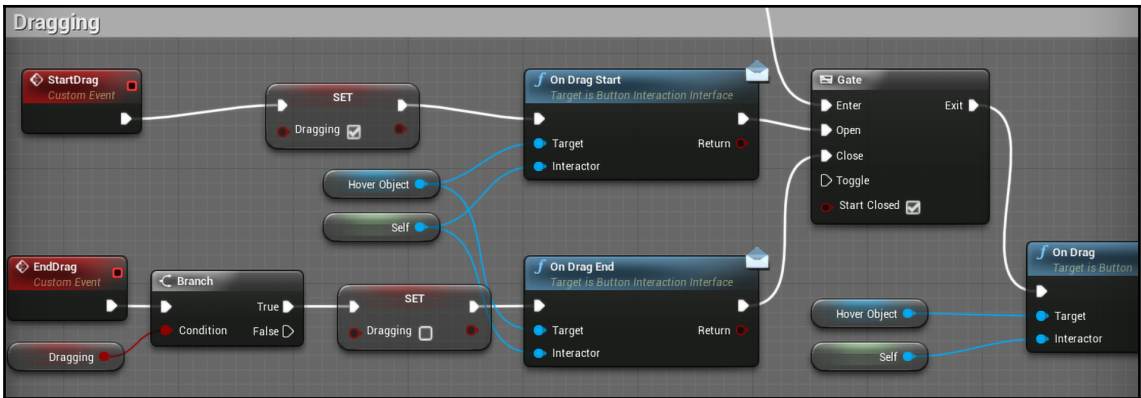


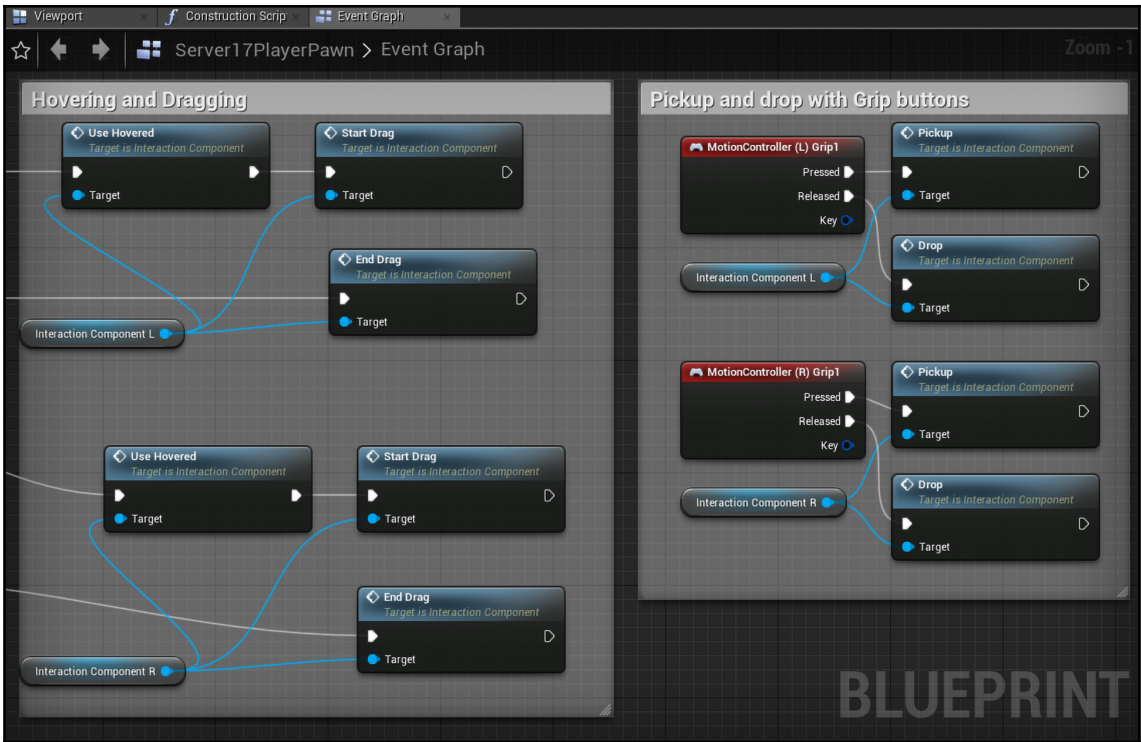


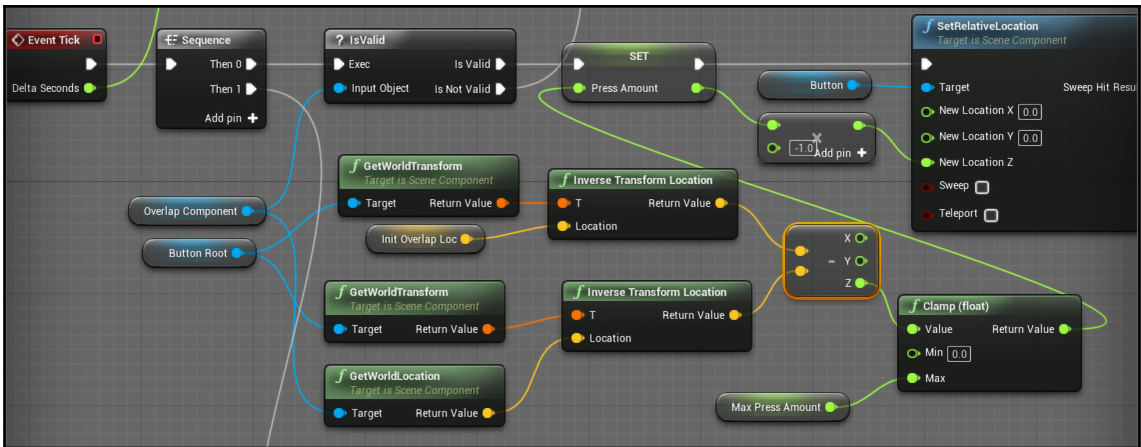
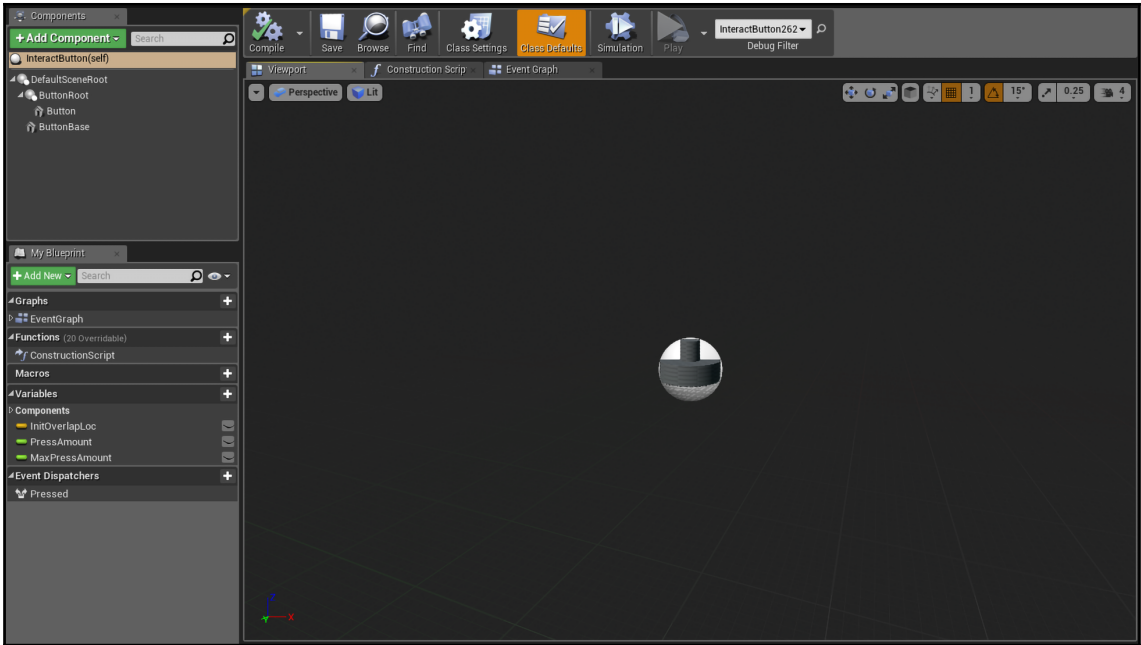




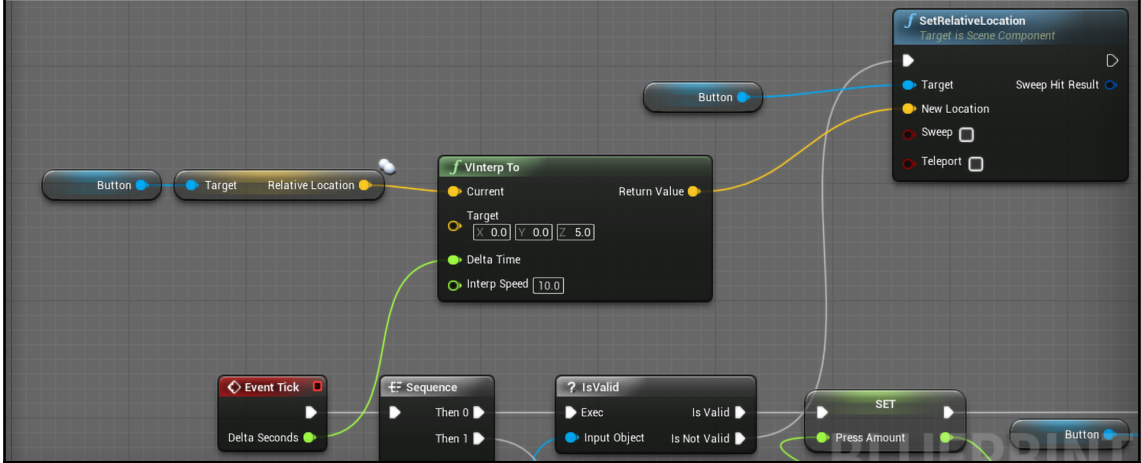




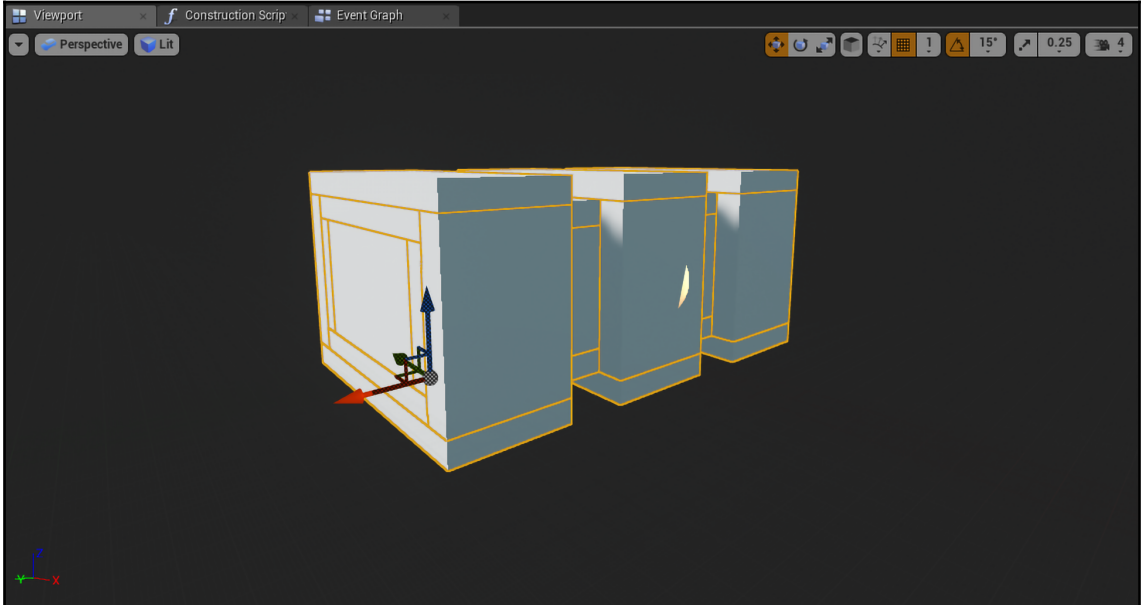
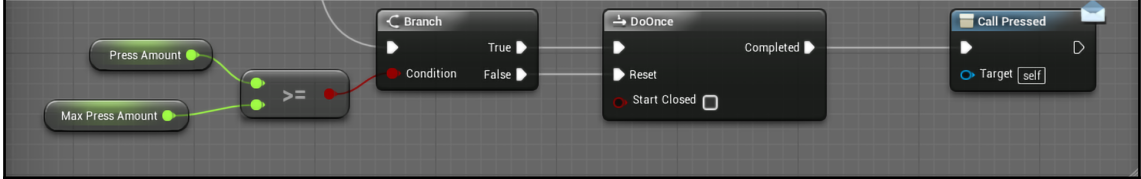


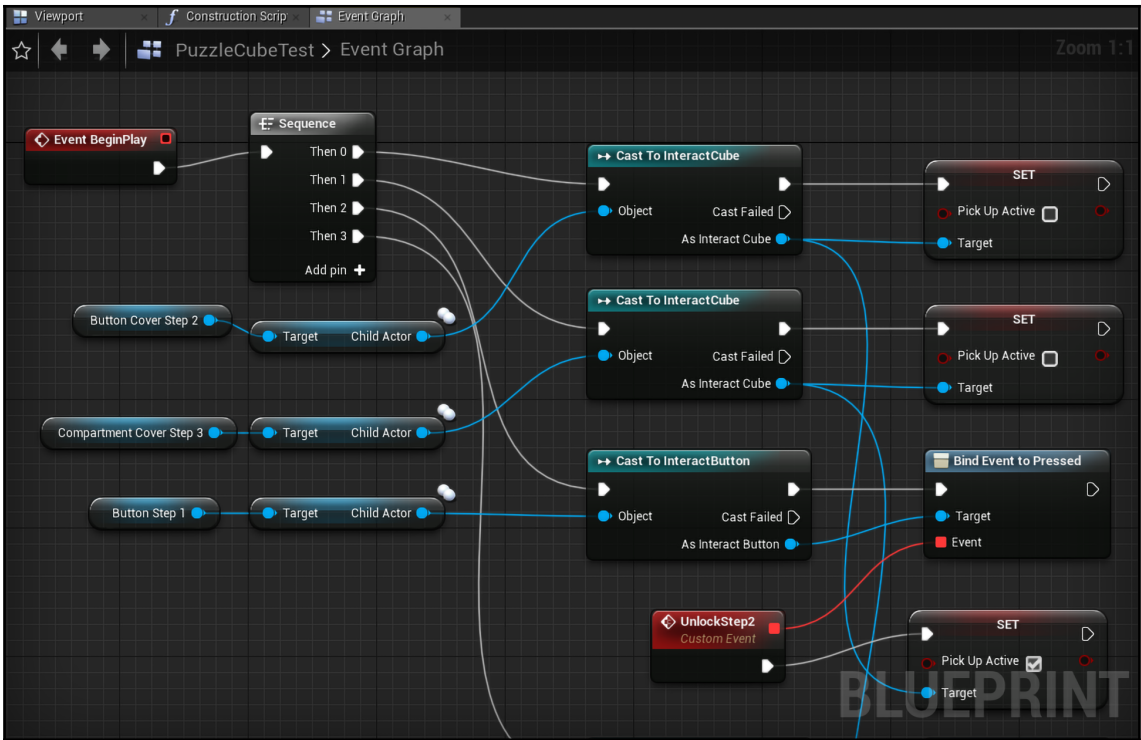


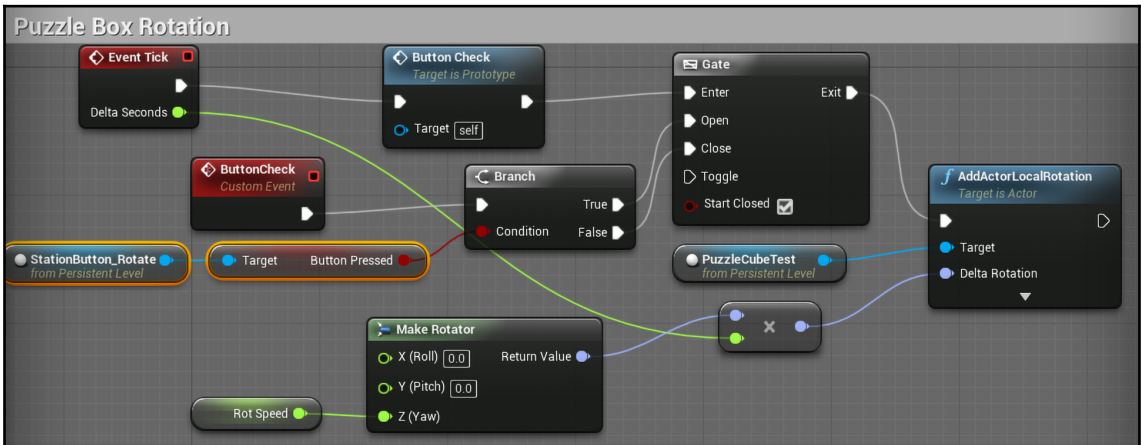
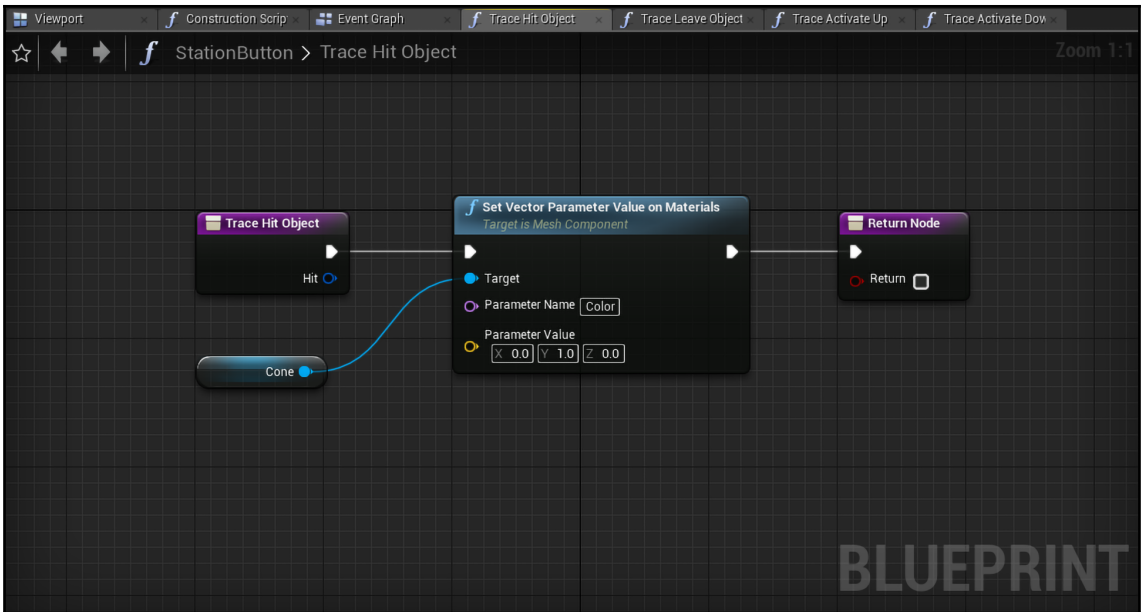
Button Animation



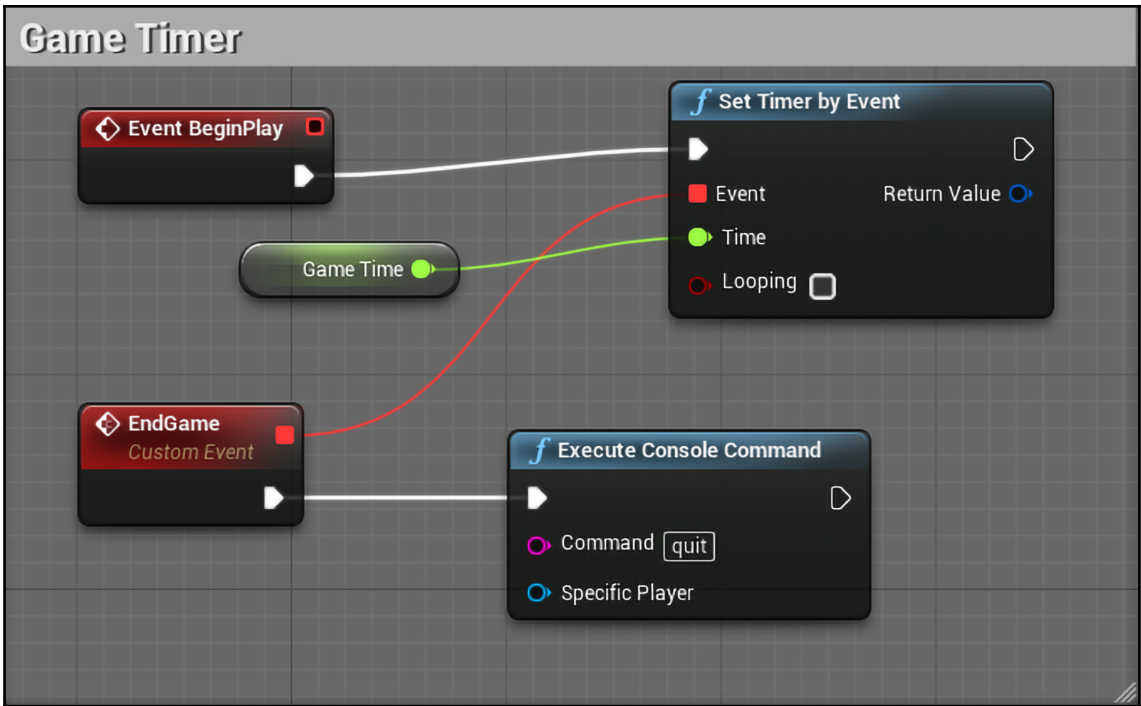
What happens when the button is pressed?



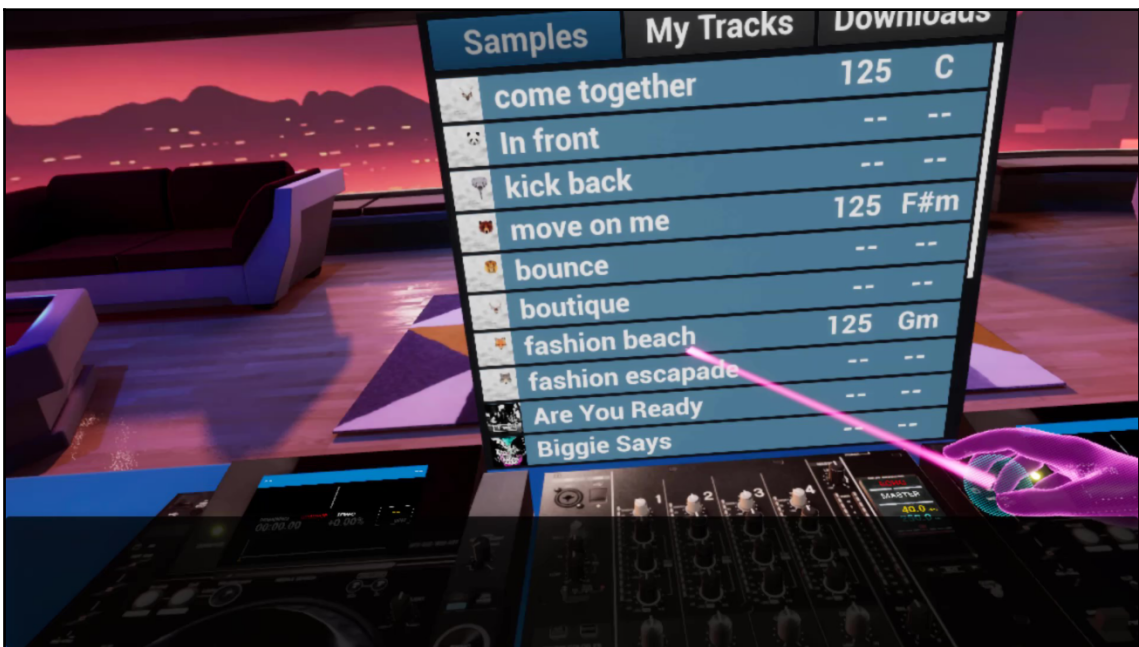




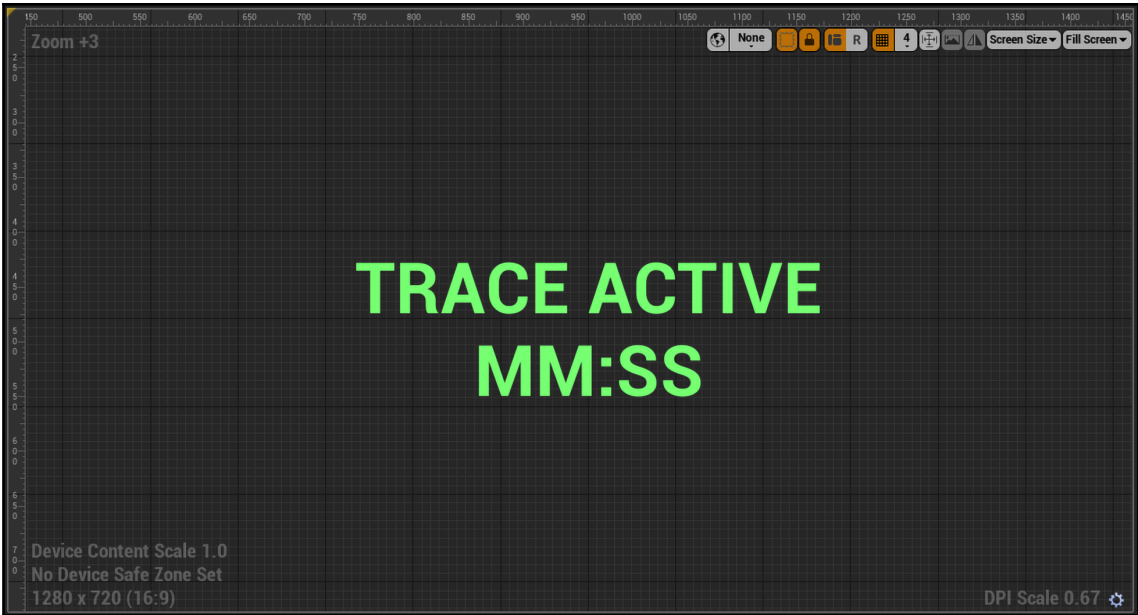
Game Timer

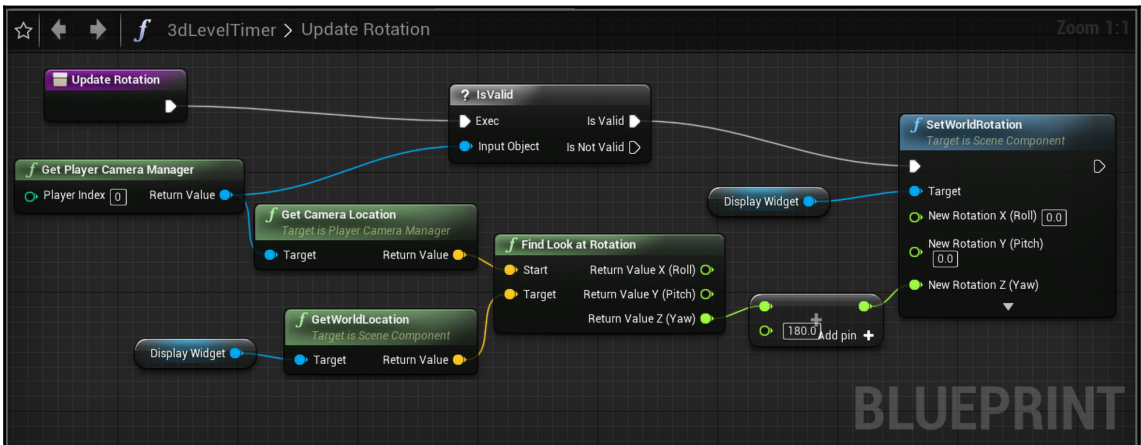
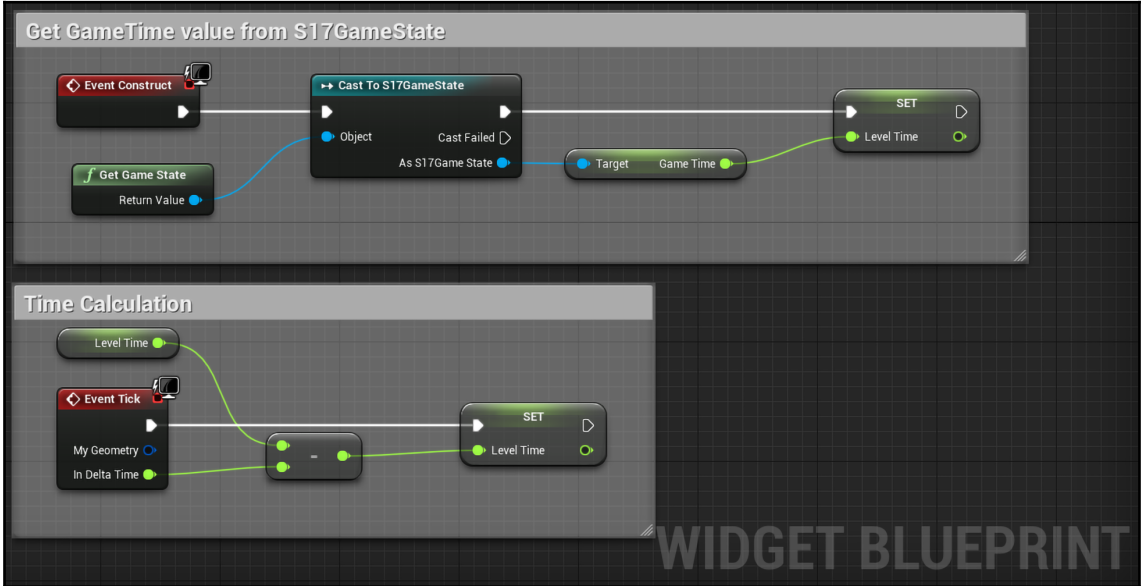
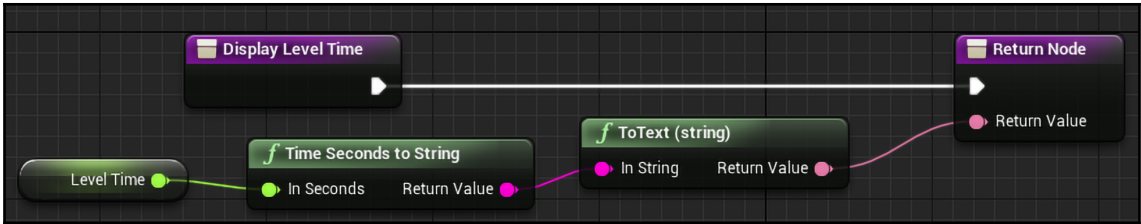


Chapter 4: User Interface and User Experience inside VR









Tools Panel

Vertical Box



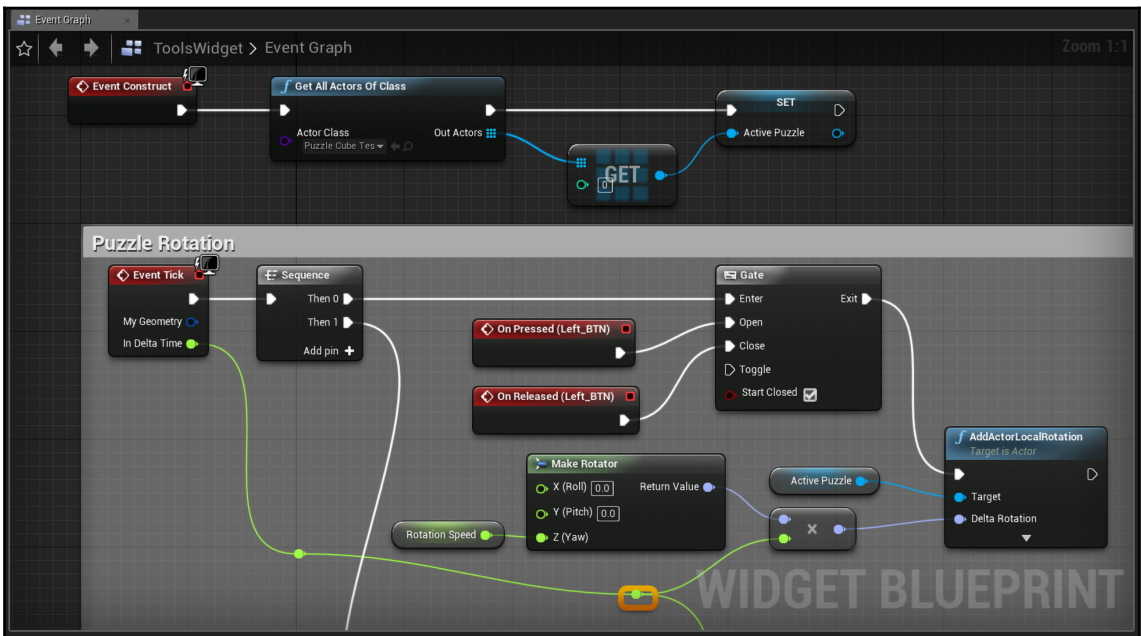
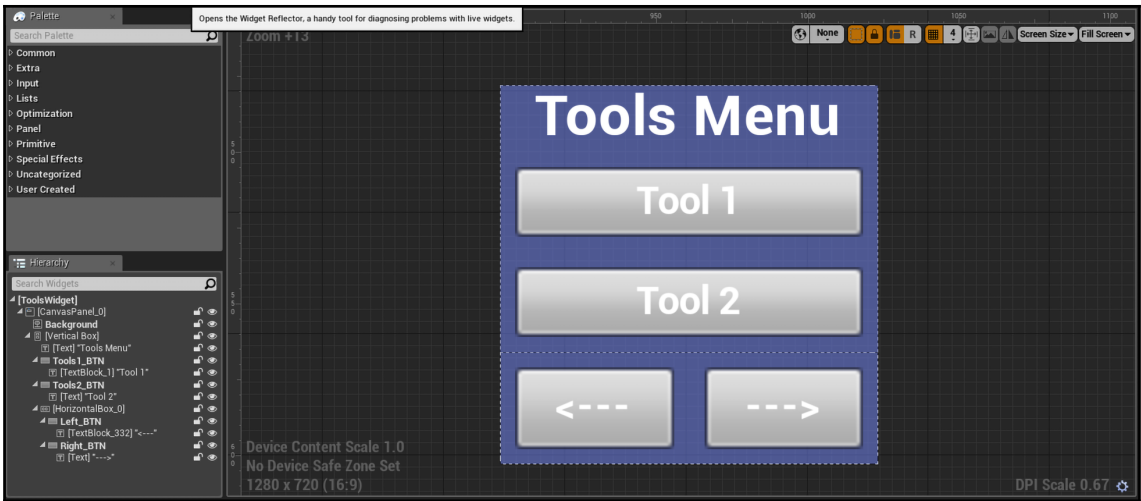
Horizontal Box

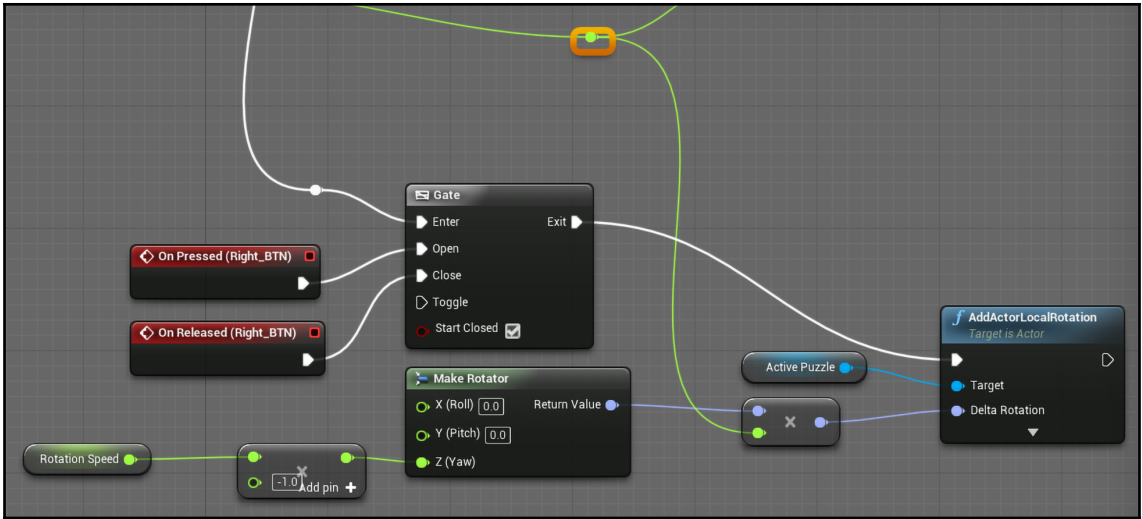


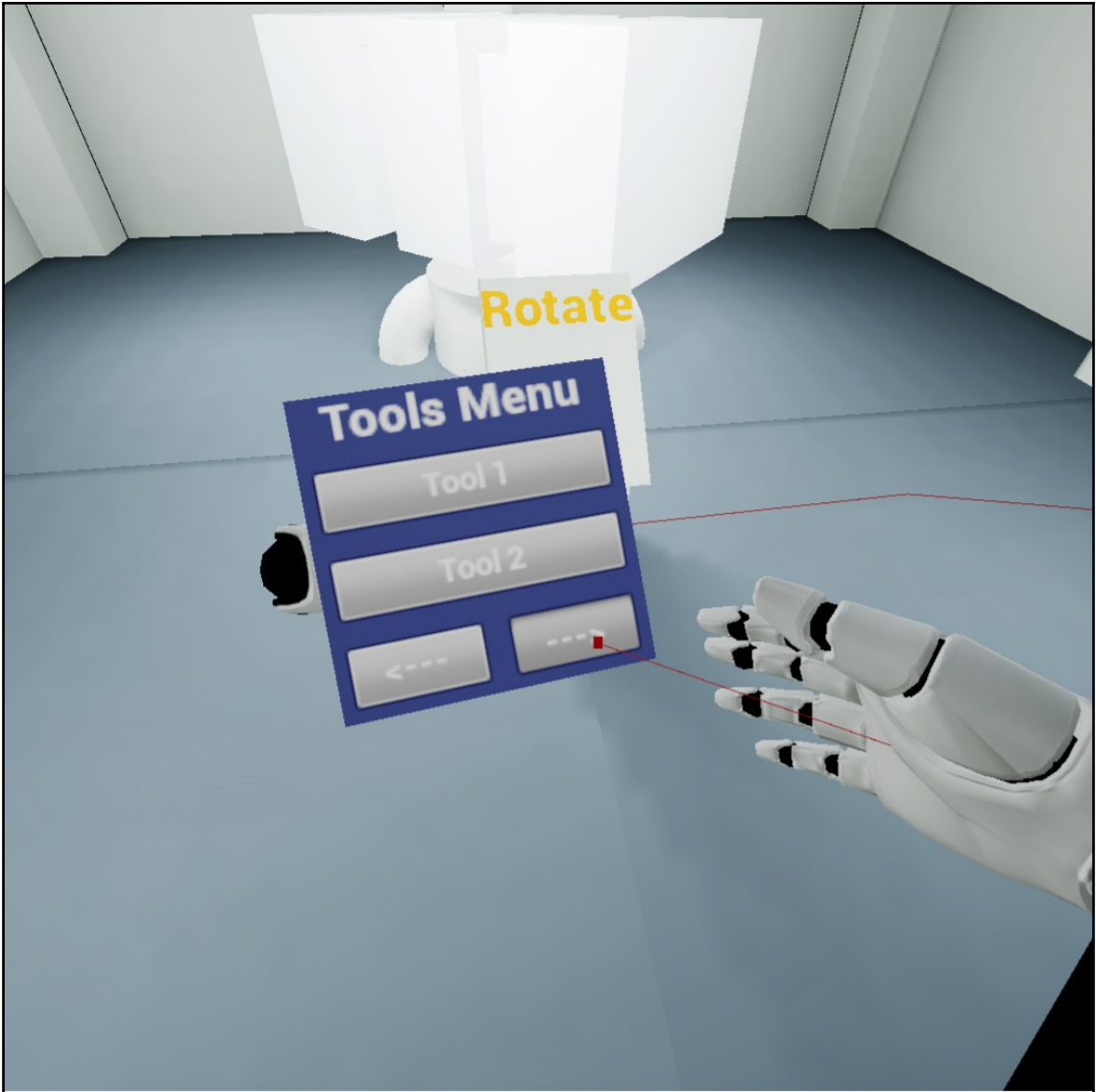
Left Arrow

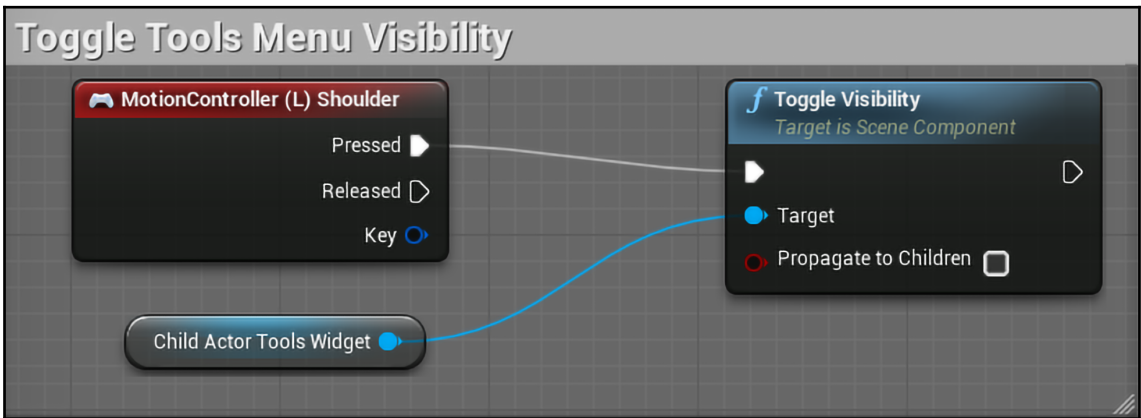
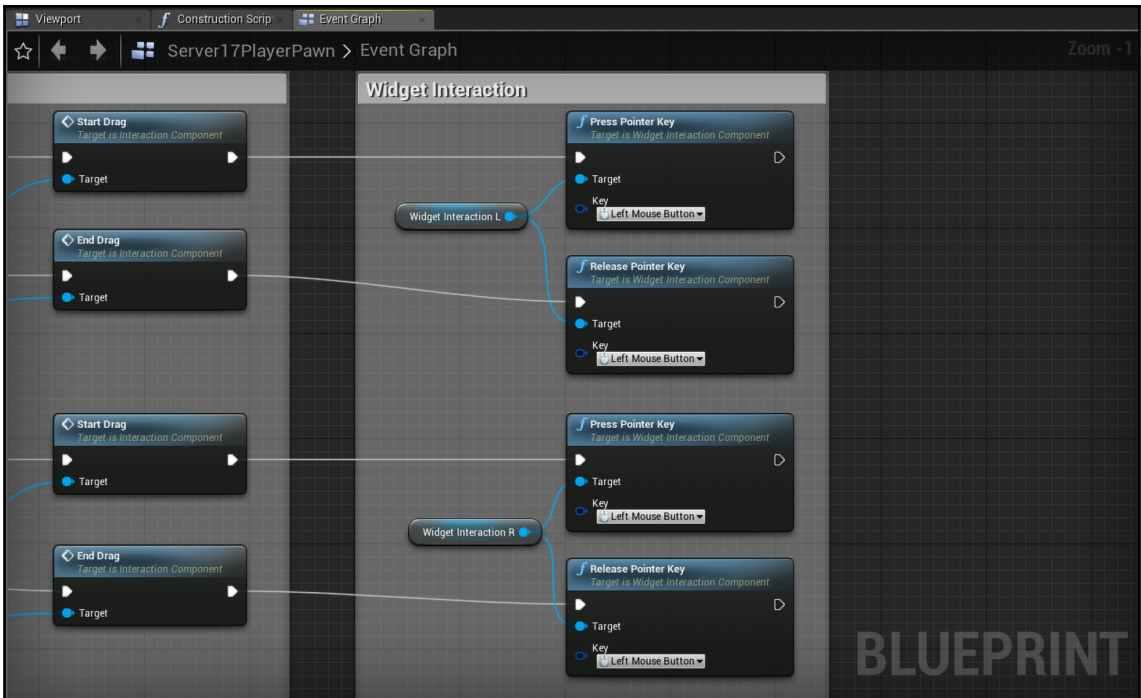


Right Arrow



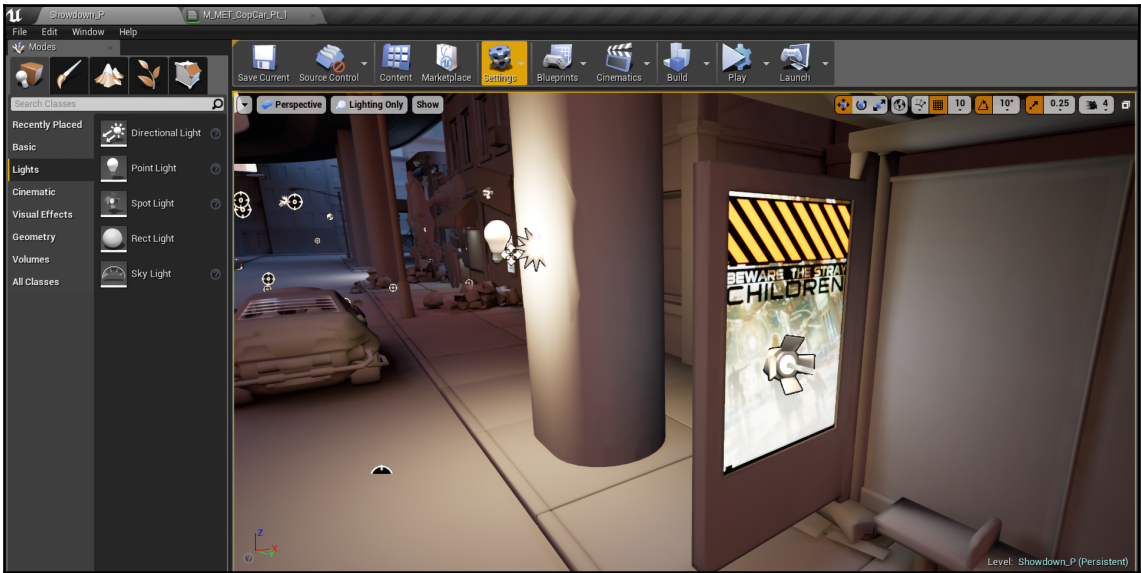
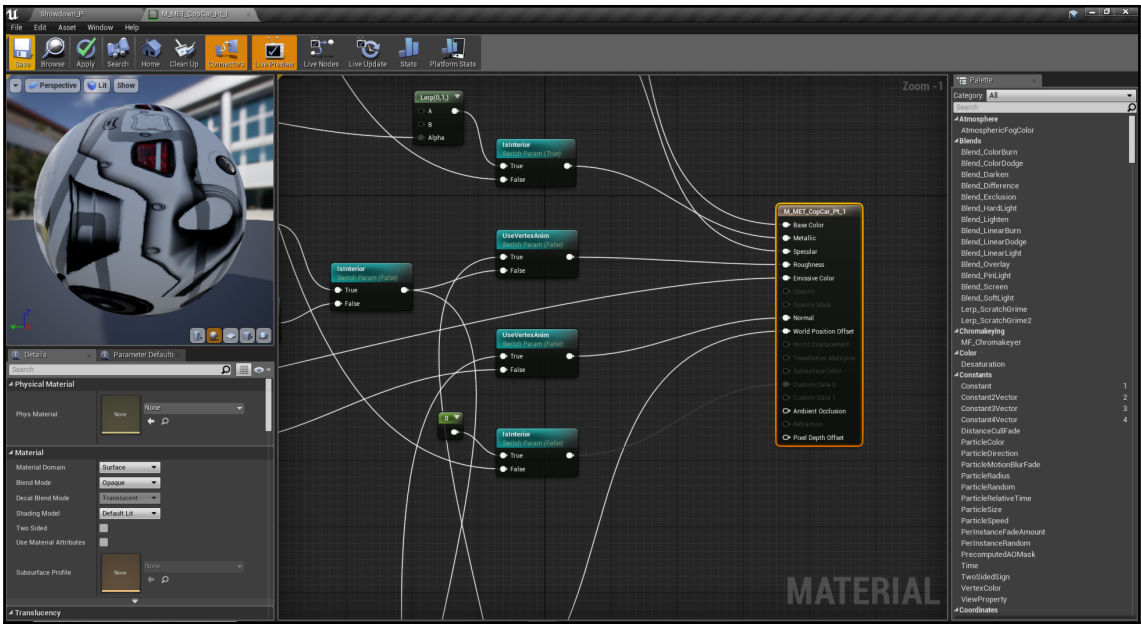


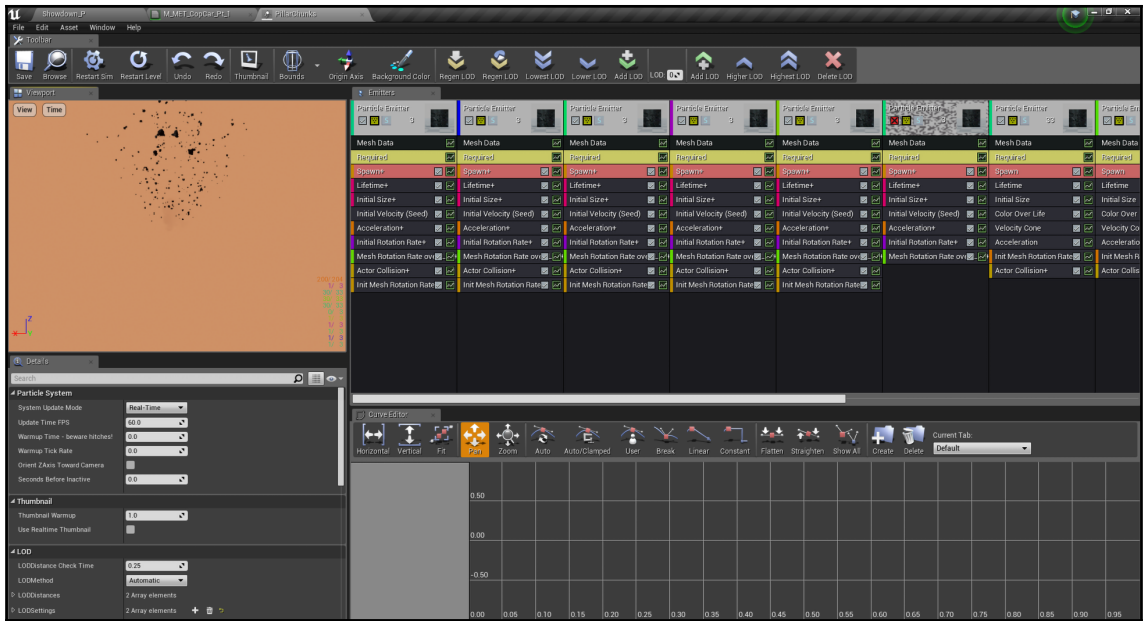




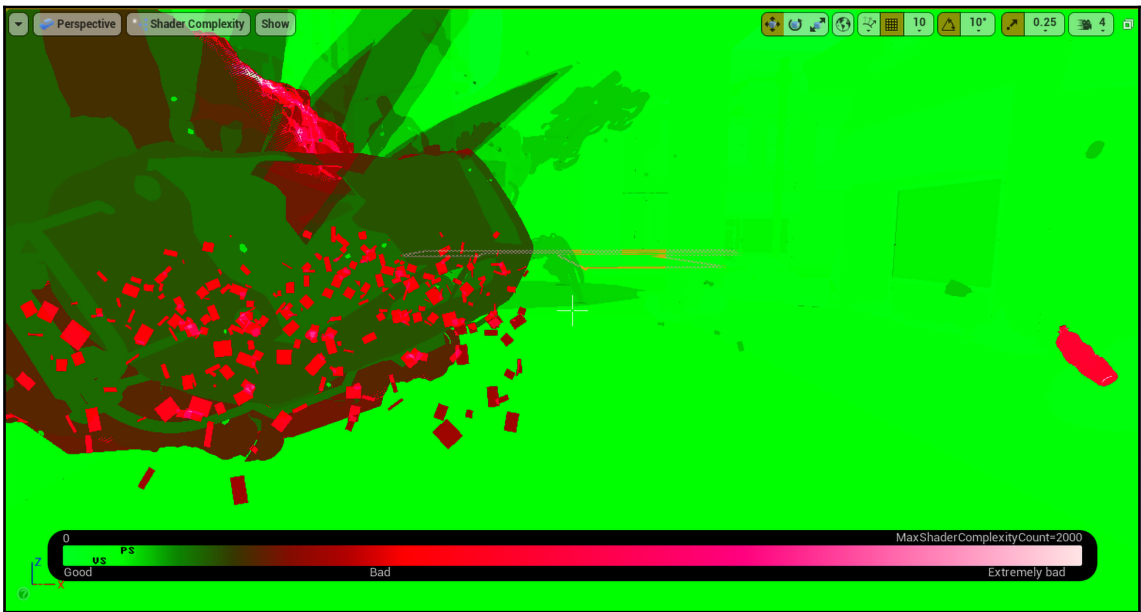
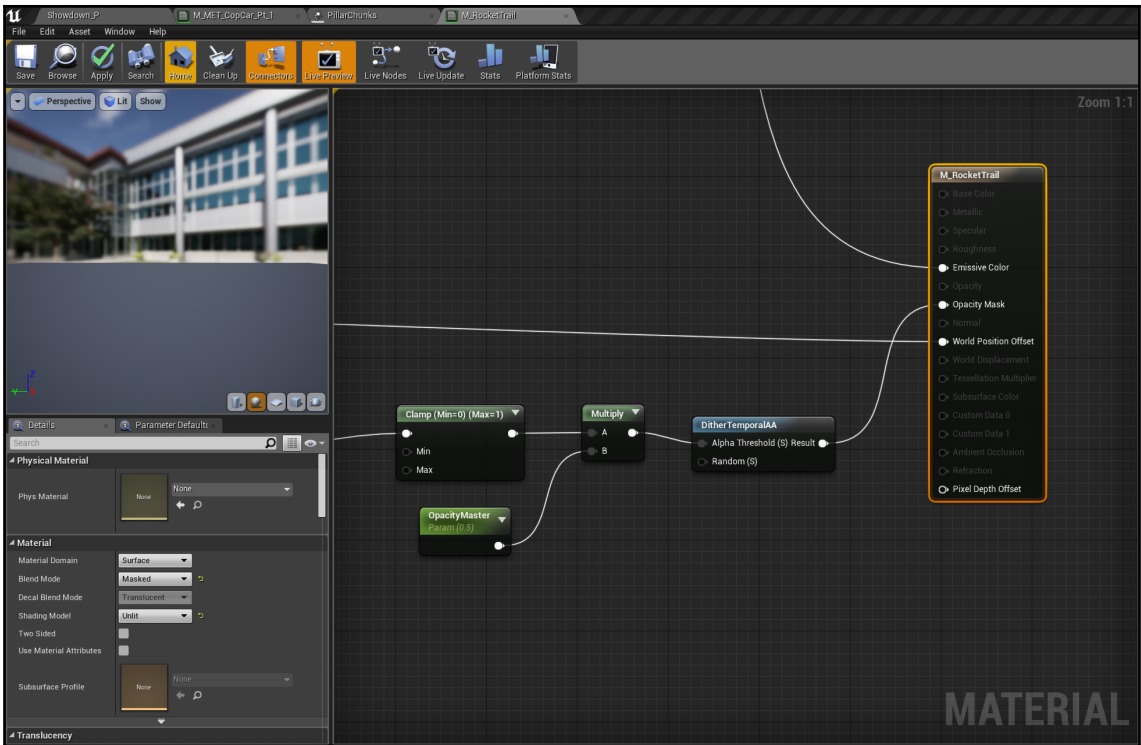
Chapter 5: Creating Optimized Game Art for VR in UE4

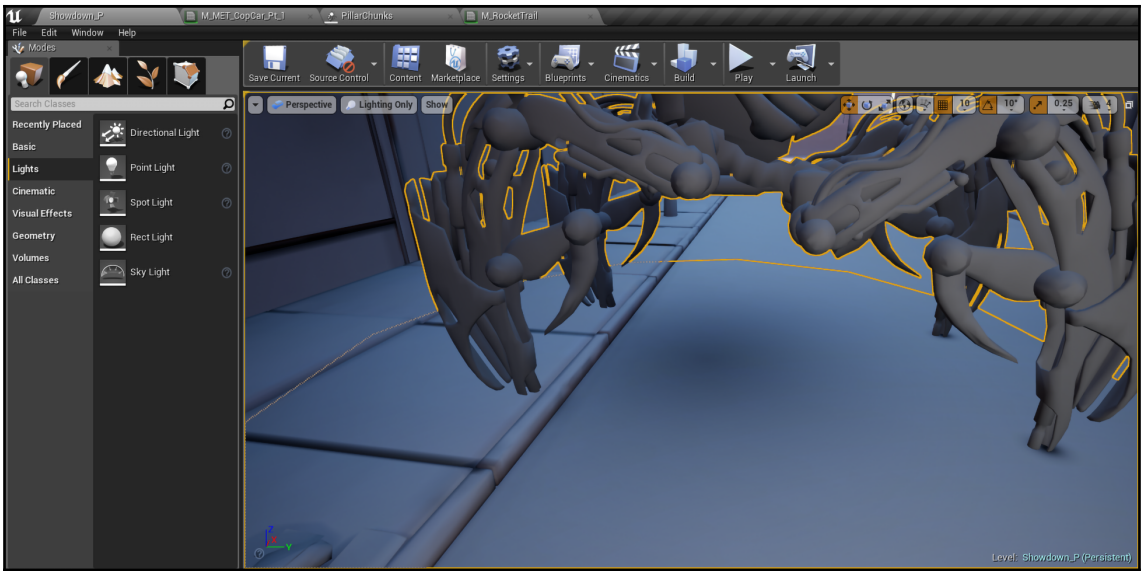


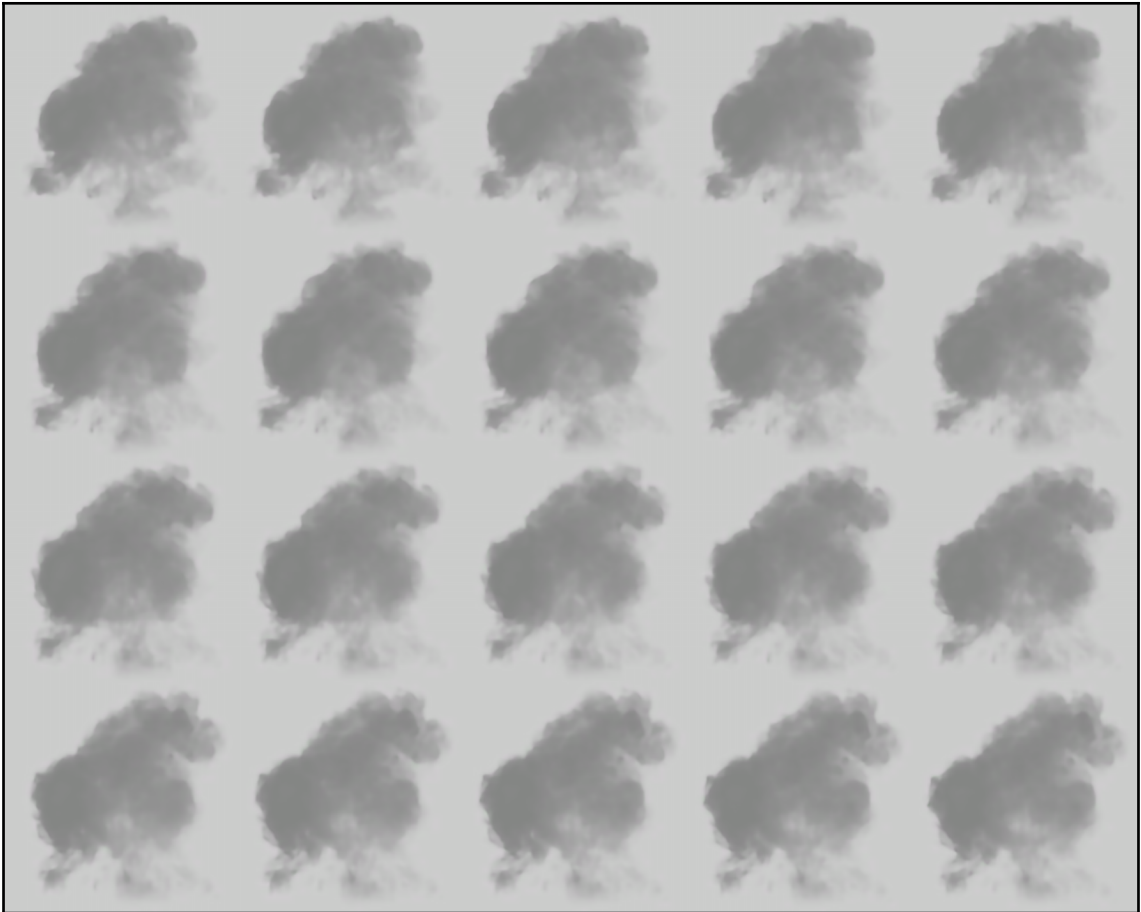












Viewport

View Time

Emitters

| lead2 | Particle Emitter | Particle Emitter | Particle Emitter |
|-------------------------|-------------------------|-----------------------|----------------------|
| 22 | 1017 | 124 | 154 |
| Mesh Data | Ribbon Data | Mesh Data | Mesh Data |
| Required | Required | Required | Required |
| Spawn | Spawn | Spawn | Spawn |
| Lifetime | Spawn Per Unit | Lifetime (Seed) | Lifetime (Seed) |
| Initial Size | Lifetime | Initial Size (Seed) | Initial Size (Seed) |
| Initial Color | Initial Size | Color Over Life | Color Over Life |
| Initial Velocity (Seed) | Color Over Life | Velocity Cone | Velocity Cone |
| Const Acceleration | Size By Life | Init Mesh Rot (Seed+) | Init Mesh Rot (Seed) |
| Scale Color / Life | Source | Velocity / Life+ | Velocity / Life+ |
| Mesh Material | Initial Velocity (Seed) | | |
| Velocity Cone | | | |
| Sphere (Seed) | | | |
| Init Mesh Rot (Seed+) | | | |
| Velocity / Life+ | | | |
| Init Mesh Rotation Rate | | | |

100 / 154
1000 / 1000
1100 / 1000
1100 / 1000

| Scene Rendering (STATGROUP_scenerendering) | | | | | |
|---|-----------|--------------|--------------|--------------|--------------|
| Cycle counters (flat) | | | | | |
| | CallCount | InclusiveAvg | InclusiveMax | ExclusiveAvg | ExclusiveMax |
| RenderViewFamily | 1 | 1.40 ms | 2.10 ms | 0.06 ms | 0.15 ms |
| InitViews | 1 | 0.37 ms | 0.53 ms | 0.01 ms | 0.02 ms |
| FinishRenderViewTarget | 1 | 0.36 ms | 0.48 ms | 0.00 ms | 0.00 ms |
| Base pass drawing | 1 | 0.14 ms | 0.26 ms | 0.01 ms | 0.03 ms |
| StaticDrawList drawing | 1 | 0.12 ms | 0.24 ms | 0.11 ms | 0.22 ms |
| Depth drawing | 1 | 0.10 ms | 0.17 ms | 0.09 ms | 0.16 ms |
| DeferredShadingSceneRenderer Lighting | 1 | 0.04 ms | 0.55 ms | 0.03 ms | 0.53 ms |
| InitViewsPossiblyAfterPrepass | 1 | 0.03 ms | 0.04 ms | 0.01 ms | 0.01 ms |
| Translucency drawing | 1 | 0.04 ms | 0.08 ms | 0.03 ms | 0.07 ms |
| BeginOcclusion Tests | 1 | 0.04 ms | 0.08 ms | 0.04 ms | 0.08 ms |
| RenderQuery Result | | | | | |
| Lighting drawing | 1 | 0.01 ms | 0.01 ms | 0.00 ms | 0.00 ms |
| DeferredShadingSceneRenderer Render Init | 1 | 0.03 ms | 0.05 ms | 0.03 ms | 0.05 ms |
| Proj Shadow drawing | | | | | |
| Dynamic shadow setup | 1 | 0.01 ms | 0.01 ms | 0.00 ms | 0.01 ms |
| Dynamic Primitive drawing | 1 | 0.01 ms | 0.02 ms | 0.01 ms | 0.02 ms |
| Cache Uniform Expressions | 6 | 0.01 ms | 0.04 ms | 0.01 ms | 0.04 ms |
| ...ferredShadingSceneRenderer AfterBasePass | 1 | 0.01 ms | 0.02 ms | 0.01 ms | 0.02 ms |
| ...dSceneRenderer FXSystem PostRenderOpaque | 1 | 0.01 ms | 0.02 ms | 0.00 ms | 0.02 ms |
| DeferredShadingSceneRenderer DBuffer | 1 | 0.01 ms | 0.01 ms | 0.01 ms | 0.01 ms |
| ...dingSceneRenderer SetAndClearViewGBuffer | 1 | 0.01 ms | 0.07 ms | 0.01 ms | 0.07 ms |
| ...dShadingSceneRenderer FXSystem PreRender | 1 | 0.01 ms | 0.01 ms | 0.00 ms | 0.01 ms |
| ...ngSceneRenderer Render ServiceLocalQueue | 23 | 0.01 ms | 0.02 ms | 0.01 ms | 0.02 ms |
| ...ShadingSceneRenderer AllocGBufferTargets | 1 | 0.00 ms | 0.01 ms | 0.00 ms | 0.01 ms |
| ...ferredShadingSceneRenderer RenderFinish | 1 | 0.00 ms | 0.00 ms | 0.00 ms | 0.00 ms |
| (11 more stats. Use the stats.MaxPerGroup.CVar to increase the limit) | | | | | |
| Counters | Average | Max | | | |
| Present time | 1.67 ms | 2.67 ms | | | |
| Mesh draw calls | 77.00 | 77.00 | | | |
| Static list draw calls | 70.00 | 70.00 | | | |
| Lights in scene | | 23.00 | | | |
| Translucency GPU Time (MS) | 0.00 | 0.01 | | | |

GPU Visualizer

Load Save

FRAME

WorldTick

Scene

SlateUI

FRAME Leaf Events

Zoom: 1.00x

Search

| Name | Duration (ms) |
|-----------|---------------|
| WorldTick | 0.06 |
| Scene | 1.72 |
| SlateUI | 0.85 |
| SlateUI | 0.01 |

Chapter 6: Finalizing Our VR Game and Next Steps

