

Getting Started with SRWorks Experience in Unreal

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Prerequisites

To work with this demo project, it is important to have some understanding of Unreal including the use of the **Motion Controller** class, **Blueprint**, **Level Streaming**, and the **Game Instance** class.

To start, unzip the file **SRWorks_Experience.zip** and manually build the solution. Then open the project file **Experience_Unreal.uproject**.

Structure

Levels

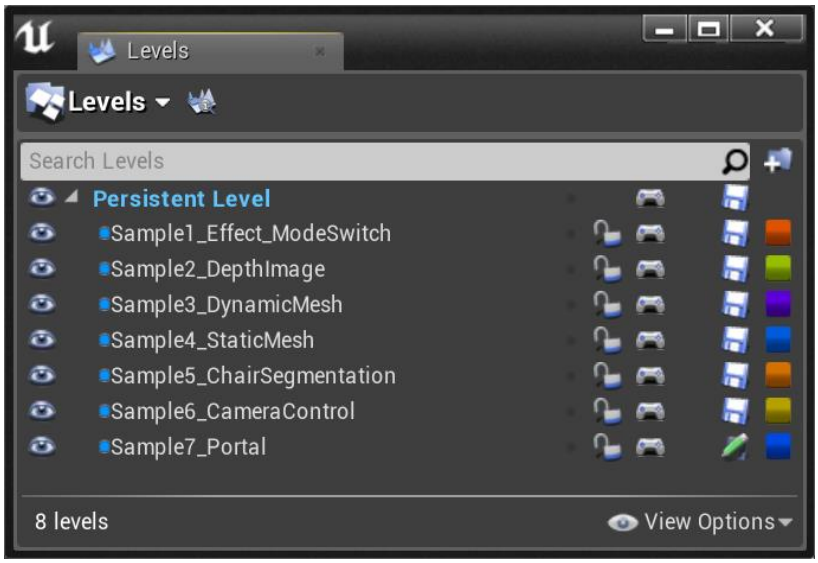


Figure 1. Levels in Persistent Map

In **Content Browser**, open **Content > Maps > Persistent Map**. In the **Levels** window, you will see that all maps have already been added (Figure 2).

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SRWorks Actors

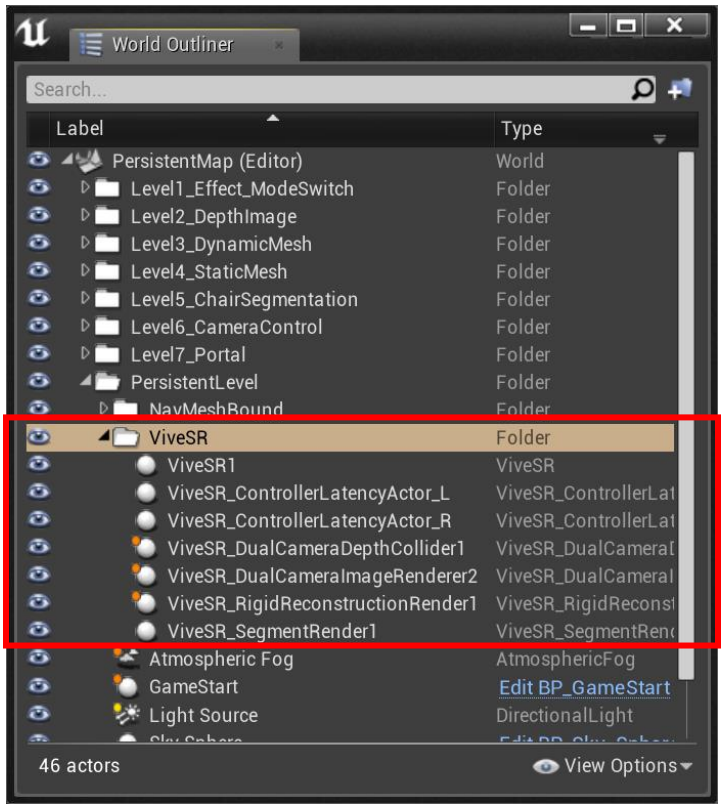


Figure 2. ViveSR Actors

Persistent Level contains a set of **ViveSR** actors (Figure 3). These actors contains functions of SRWorks. Each level in this project references some of those actors.

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GameStart

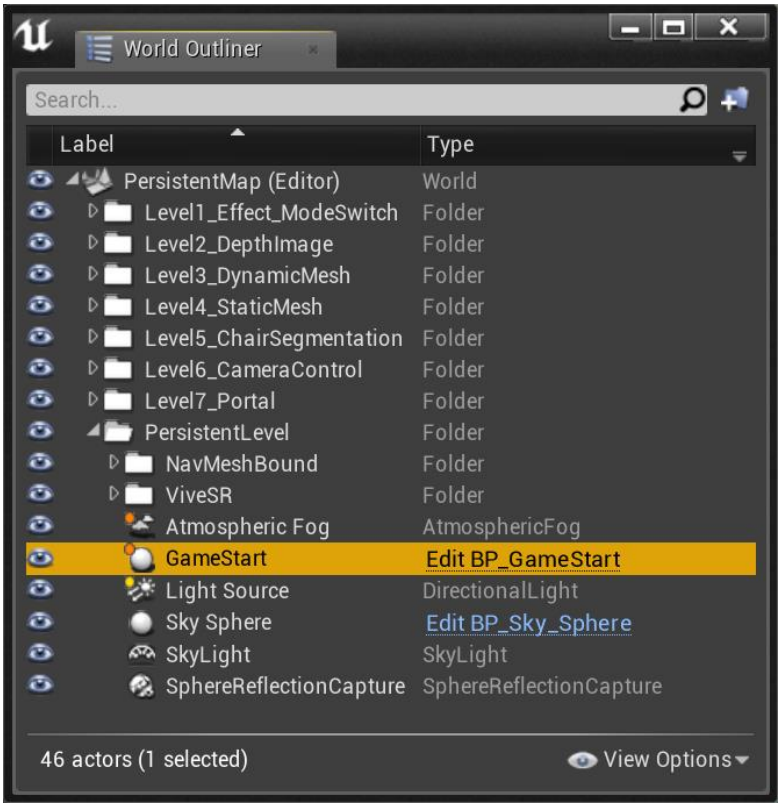


Figure 3. BP_GameStart

BP_GameStart serves two purposes:

(1) Storing the actor **ViveSR1** as a reference in **BP_Experience_SaveGame**. for it to be used cross levels

(2) Loading all the levels upon **BeginPlay** and sets only the starting level, or **Level1_Effect_ModeSwitch**, to visible

Pawns

Persistent Level loads seven maps:

(3) Level1_ Effects_ModeSwitch
(4) Level2_DepthImage
(5) Level3_DynamicMesh
(6) Level4_StaticMesh
(7) Level5_ChairSegmentation
(8) Level6_CameraControl
(9) Level7_Portal

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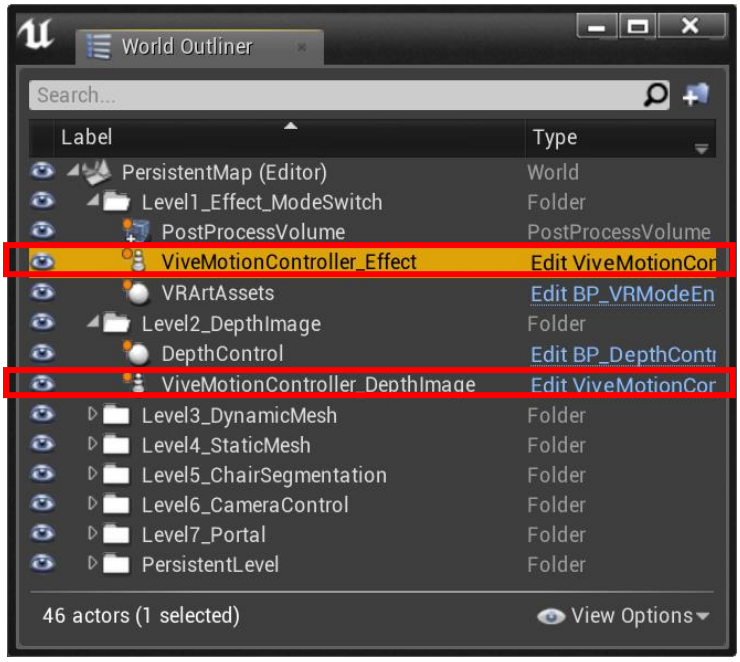


Figure 4. ViveMotionController

Each map contains a child blueprint of **ViveMotionController**, which serves three purposes:

(1) Initiating tracking of the HMD and the Vive Controllers,
(2) Finding reference of **ViveSR** from **BP_Experience_SaveGame**, and
(3) Handling the controller input, Grip, for switching levels.

The child Blueprints of **ViveMotionController** handle controller input for demonstrating different features of SRWorks. For example, in the level **Level1_Effect_ModeSwitch**, **Vive_MotionController_Effects** is to control two of the many features of SRWorks:

(1) Mode Switch—switching between VR Mode and Mix Mode and
(2) Shader Effects—switching the shaders for the pass-through planes.

This structure also applies to all other six levels. Each level has a child Blueprint of **ViveMotionController** that handles controller input and each of them demonstrates part of what SRWorks can do.

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Level 1—Effects & Mode Switch

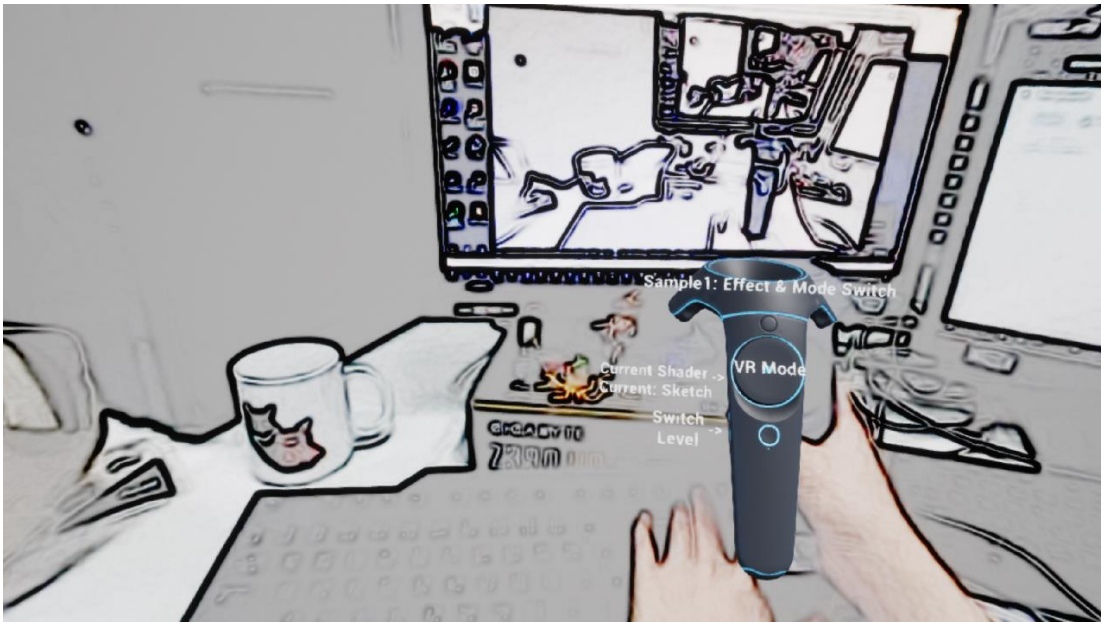


Figure 5. Level 1—Effects & Mode Switch

Features

Feature	Description
Shader Effects	Processes captured images with shaders to create stylized result
Mode Switch	Switches between the VR world and the real world

Table 1. Features Demonstrated in Level 1

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Actors and Blueprints

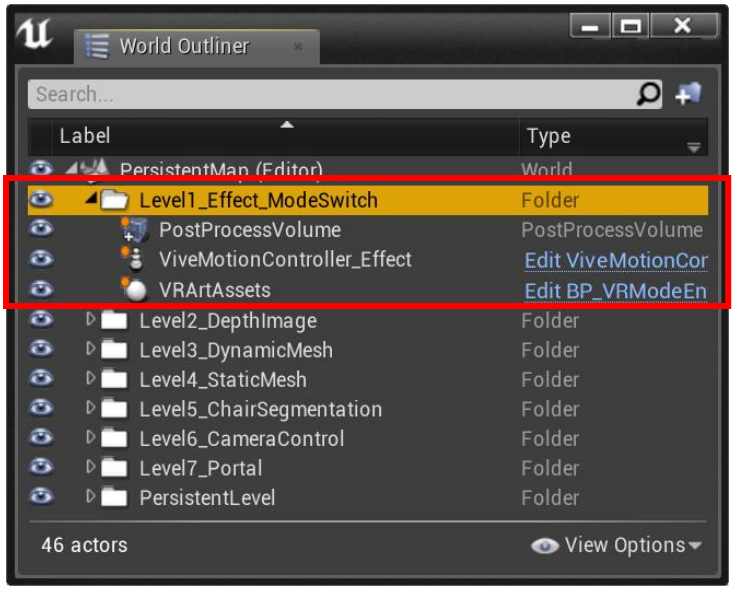


Figure 6. Actors and Blueprints in Level 1

Actor/Pawn	Blueprint	Description
ViveMotionController_Effect	ViveMotionController_Effect	Handles player input for changing shader effects and switching modes

Table 2. Controller Input in Level 1

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Level 2—Depth Image

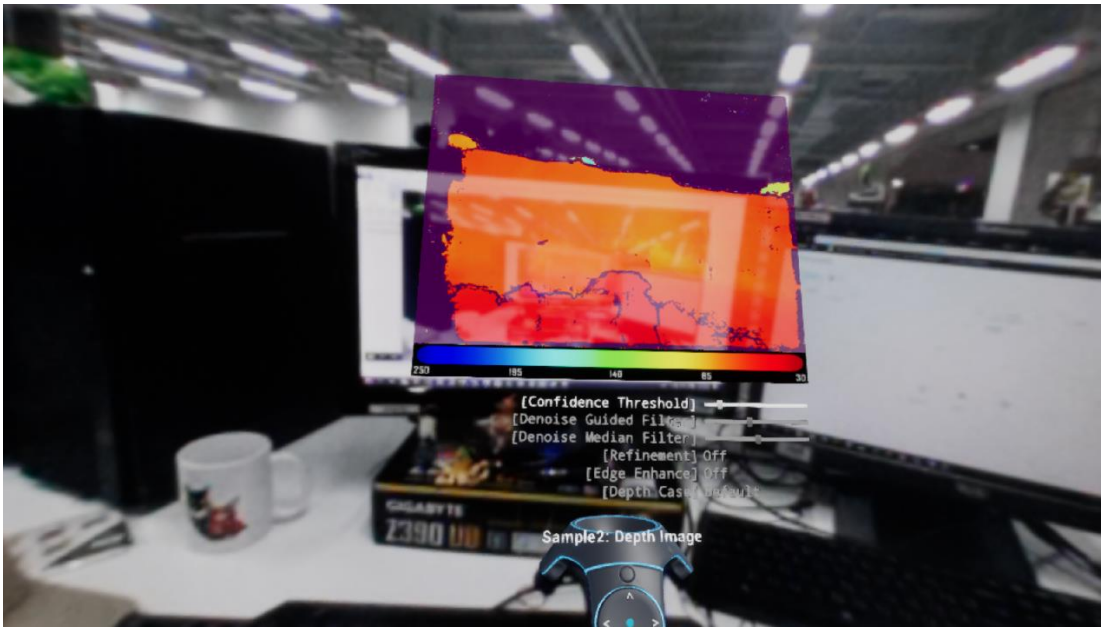


Figure 7. Level 2—Depth Image

Features

Feature	Description
Depth Image	Depth value visualized and rendered
depth's adjustable parameters	Depth quality is adjustable with the following parameters: (1) Confidence Threshold (2) Denoise Guided Filter (3) Denoise Median Filter (4) Refinement: On/Off (5) Edge Enhance On/Off (6) Depth Case Default/Close Range

Table 3. Features Demonstrated in Level 2

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Actors and Blueprints

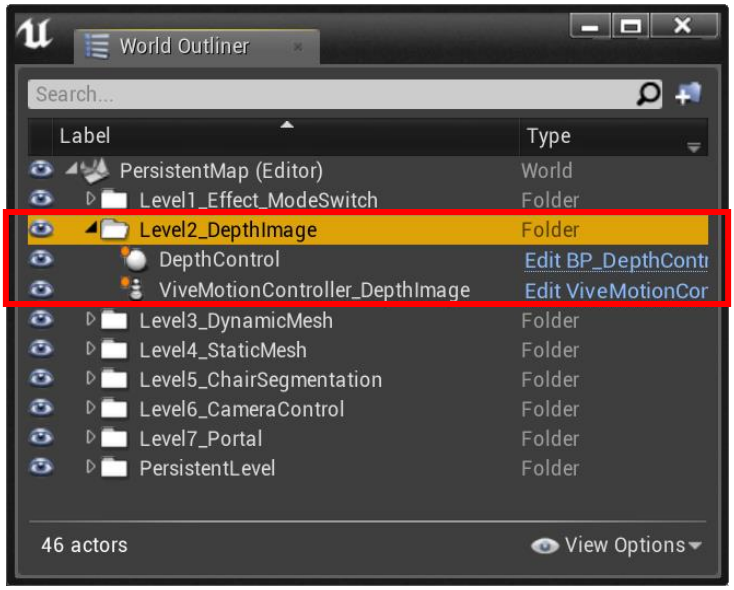


Figure 8. Actors and Blueprints in Level 2

Actor	Blueprint	Description
ViveMotionController_DepthImage	ViveMotionController_DepthImage	Handling controller inputs for controlling depth image parameters
DepthControl	BP_DepthControl	Containing functions for setting depth image values

Table 4. Actors and Blueprints in Level 2

Controller Input

Input	Description
Touchpad Up	Move up one row on Depth Control Panel
Touchpad Down	Move down one row on Depth Control Panel
Touchpad Left	Decrease the value of the highlighted slider on Depth Control Panel
Touchpad Right	Increase the value of the highlighted slider on Depth Control Panel

Table 5. Controller Input in Level 2

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Level 3—Dynamic Mesh

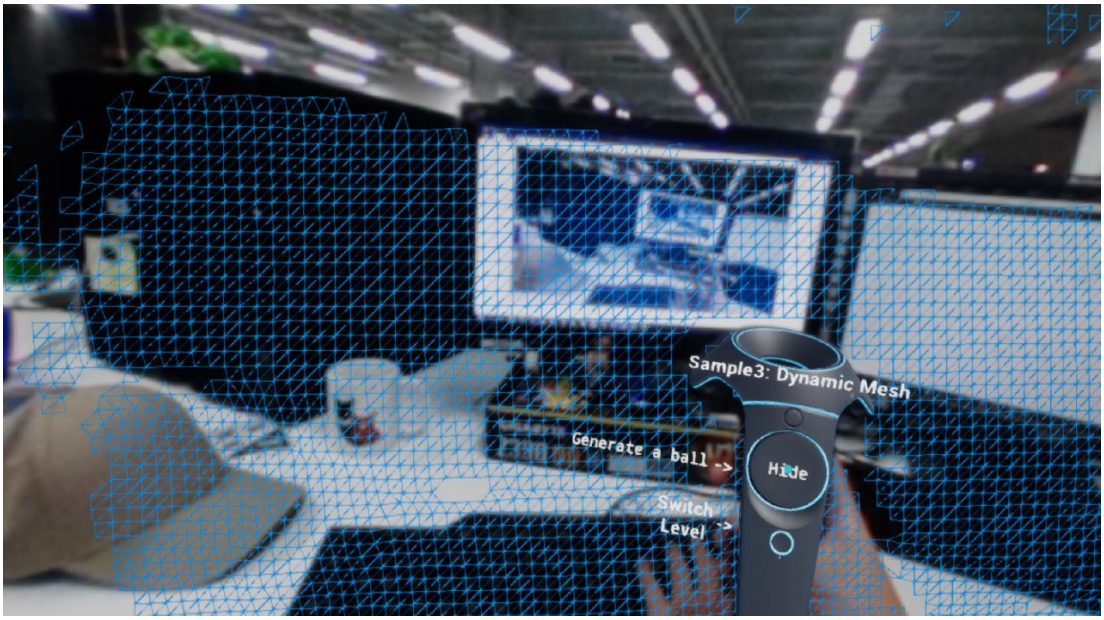


Figure 9. Level 3—Dynamic Mesh

Features

Feature	Description
Depth Mesh	Depth Mesh builds mesh based on depth value and updates every frame.

Table 6. Features Demonstrated in Level 3

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Actors and Blueprints

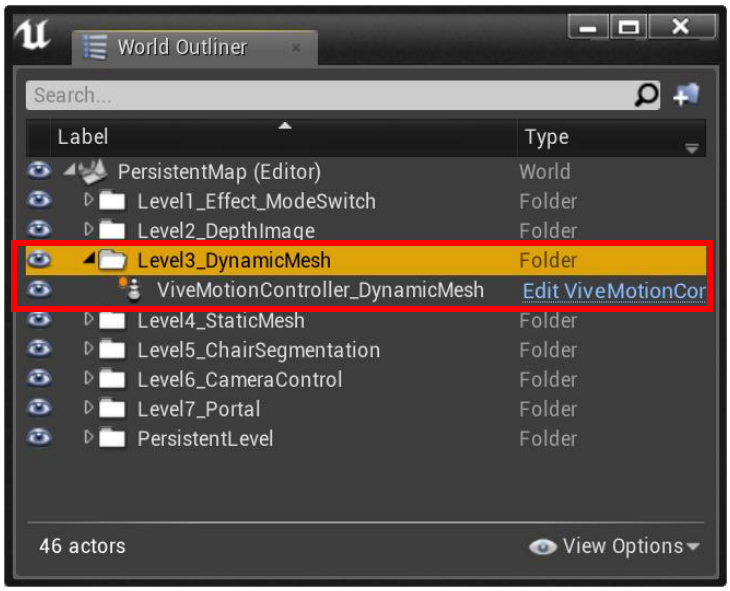


Figure 10. Actors and Blueprints in Level 3

Actor	Blueprint	Description
ViveMotionController_ DynamicMesh	ViveMotionController_ DynamicMesh	Handles controller inputs for toggling depth collider & generating throwable objects

Table 7. Actors and Blueprints in Level 3

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Level 4—Static Mesh

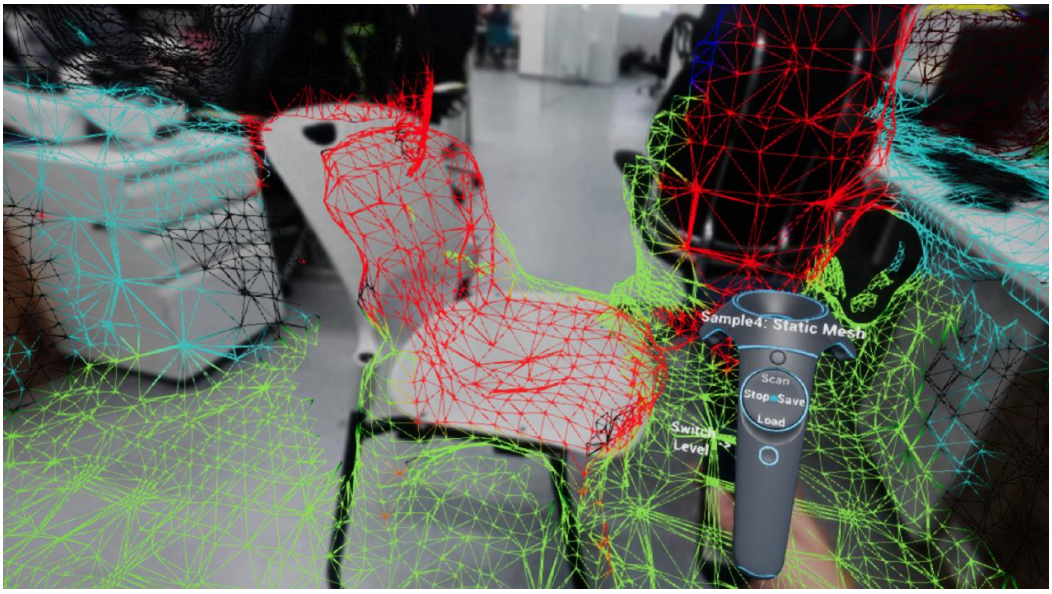


Figure 11. Level 4—Static Mesh

Compatibility

AMD graphics cards are not compatible with SRWorks' 3D Reconstruction module, a requirement of this level.

Features

Feature	Description
Static Mesh	Pre-scanned mesh that is built based on depth value taken from multiple frames

Table 8. Features Demonstrated in Level 4

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Actors and Blueprints

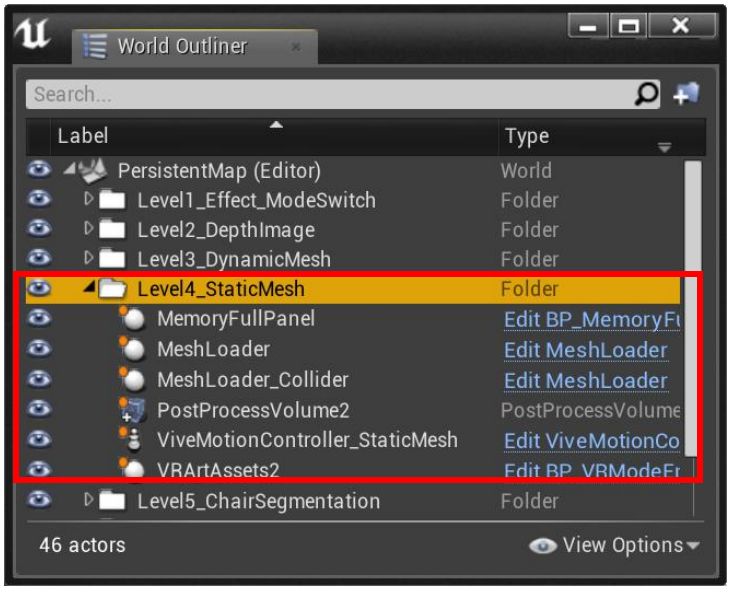


Figure 12. Actors and Blueprints in Level 4

Actor	Blueprint	Description
ViveMotionController_ StaticMesh	ViveMotionController_ StaticMesh	Handles controller inputs for showing or hiding mesh and for generating throwable objects
MeshLoader	MeshLoader	Contains functions for loading mesh
MeshLoader_Collider	MeshLoader	Contains functions for loading collider
MemoryFullPanel	BP_MemoryFullPanel	An control panel that allows the player to choose whether to save or abort the captured data when the data is too heavy for the GPU

Table 9. Actors and Blueprints in Level 4

Controller Input

Input	Description
Touchpad Up	Start scanning
Touchpad Down	Load saved mesh data from the local disc
Touchpad Left	Stop scanning
Touchpad Right	Save mesh

Table 10. Controller Input in Level 4

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Level 5—Chair Segmentation



Figure 13. Level 5—Chair Segmentation

Compatibility

AMD graphics cards are not compatible with SRWorks' 3D Reconstruction module, a requirement of this level.

Features

Feature	Description
Scene Understanding	While scanning, SRWorks seeks to understand object type in the real world. In this level, object type **chair** is used.

Table 11. Features Demonstrated in Level 5

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Actors and Blueprints

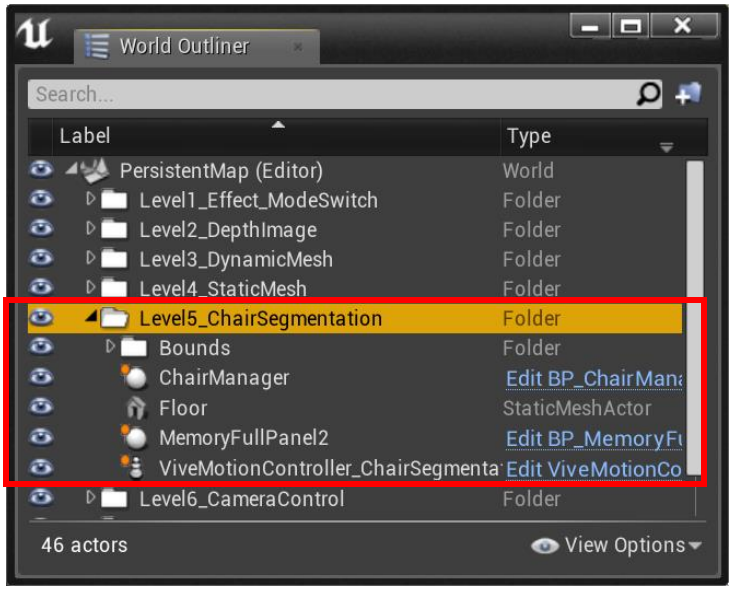


Figure 14. Actors and Blueprints in Level 5

Actor	Blueprint	Description
ViveMotionController_ ChairSegmentation	ViveMotionController_Chai rSegmentation	Handles controller inputs for scanning and saving mesh, testing whether any chair has been identified, and generating NPC fairies
MemoryFullPanel2	BP_MemoryFullPanel	An control panel that allows the player to choose whether to save or abort the captured data when the data is too heavy for the GPU
ChairManager	BP_ChairManager	Manages loaded chair data

Table 12. Actors and Blueprints in Level 5

Controller Input

Input	Description
Touchpad Up	Start scanning
Touchpad Left	Stop scanning
Touchpad Right	Save mesh
Trigger	Spawn NPC(s). The number of NPC(s) spawned equals to the number of chairs recognized

Table 13. Controller Input in Level 5

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Level 6—Camera Control



Figure 15. Level 6—Camera Control

Compatibility

VIVE COSMOS is not compatible with SRWorks' Camera Control feature.

Features

Feature	Description
Camera's adjustable parameters	Depth quality is adjustable with the following parameters: (1) Brightness (2) Contrast (3) Saturation (4) White Balance (5) White Balance Mode: Auto/Manual (6) Preset: Default/Preset

Table 14. Features Demonstrated in Level 6

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Actors and Blueprints

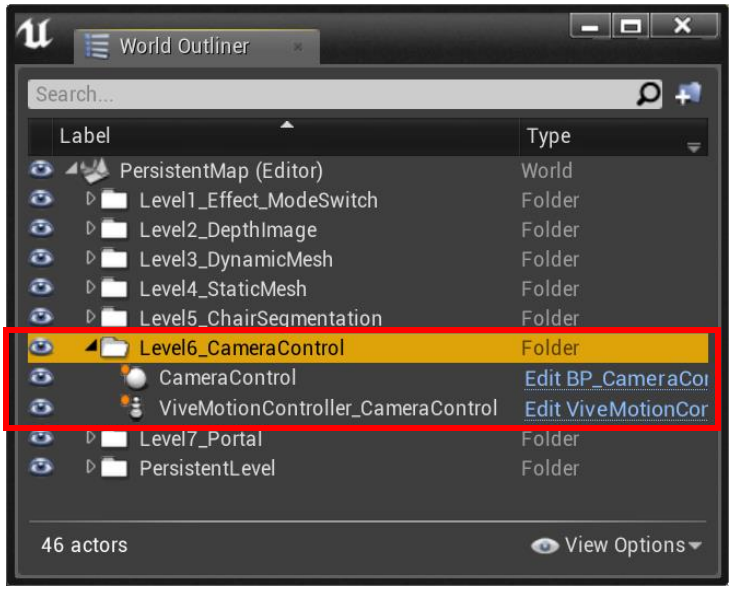


Figure 16. Actors and Blueprints in Level 6

Actor	Blueprint	Description
ViveMotionController_ CameraControl	ViveMotionController_ CameraControl	Handles controller inputs for controlling camera control values
CameraControl	BP_CameraControl	Contains functions for setting camera control values

Table 15. Actors and Blueprints in Level 6

Controller Input

Input	Description
Touchpad Up	Move up one row on Camera Control Panel
Touchpad Down	Move down one row on Camera Control Panel
Touchpad Left	Decrease the value of the highlighted slider on Camera Control Panel
Touchpad Right	Increase the value of the highlighted slider on Camera Control Panel

Table 16. Actors and Blueprints in Level 6

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Level 7—Portal

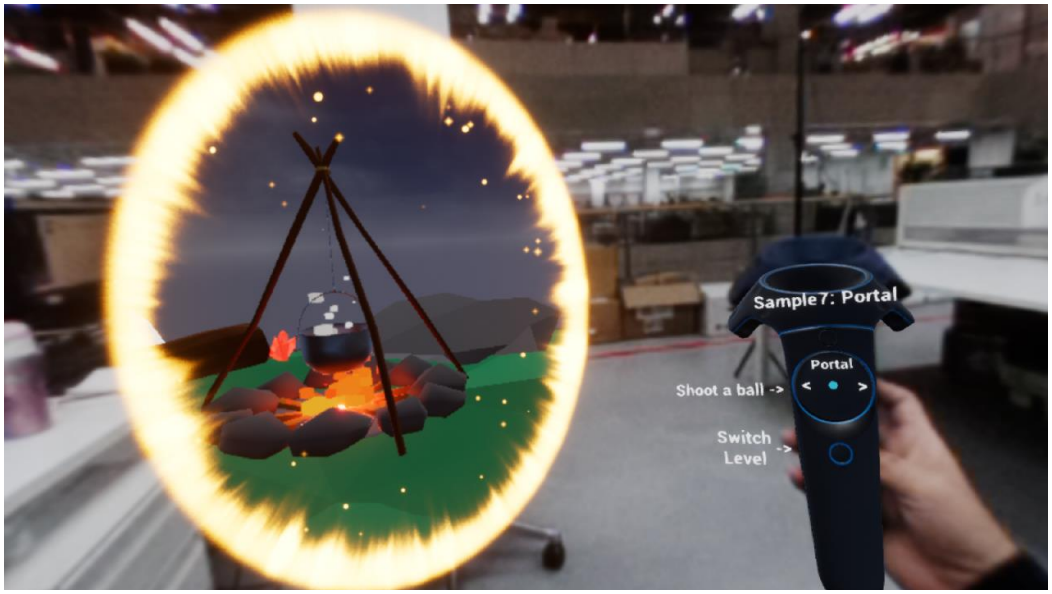


Figure 17. Level 7—Portal

Features

Feature	Description
Portal Effect	It allows the co-existence of the VR world and the real world.

Table 17. Features Demonstrated in Level 7

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Actors and Blueprints

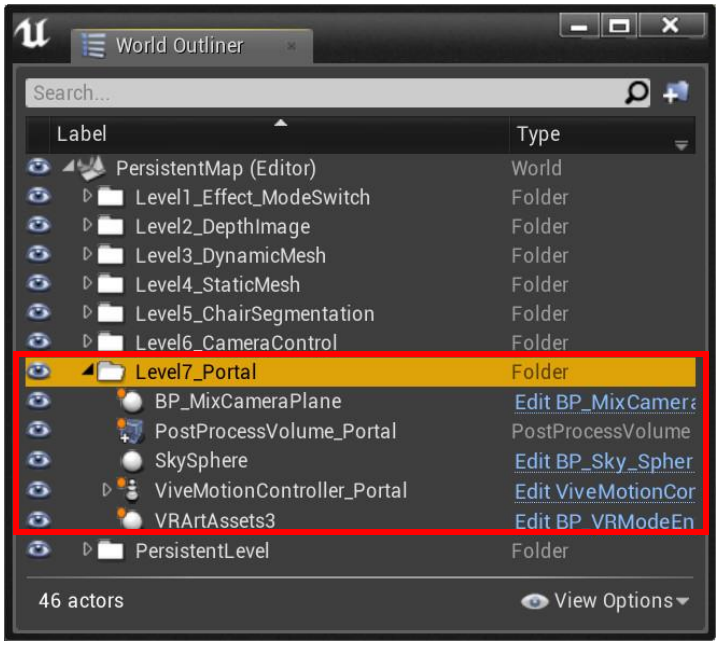


Figure 18. Actors and Blueprints in Level 7

Actor	Blueprint	Description
ViveMotionController_ Portal	ViveMotionController_ Portal	Handles controller inputs for placing the portal in front of the player and for generating objects to throw

Table 18. Actors and Blueprints in Level 7

Controller Input

Input	Description
Touchpad Up	Spawn a portal
Trigger	Spawn a ball or a VIVE doll to throw and to test collider
Touchpad Left	Switch the generated object between a ball and a VIVE doll
Touchpad Right	Switch the generated object between a ball and a VIVE doll

Table 19. Actors and Blueprints in Level 7

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