Procedural Level Generation and VR – Black Box Testing

HTC Vive Input Test Cases

Test Name	Expected Outcome	Last Test Outcome	Additional Comments
Head Rotation	• When the player rotates their head, the camera rotates as well • The rotation is in the correct direction • The rotation is the same distance	20/04/20 – The Camera smoothly followed the rotation of the user's head and did not lose synchronisation.	N/A
Head Position	• When the player moves their head, the camera moves as well • The movement is in the same direction • The movement is the same distance	20/04/20 – When the player moved around the play space the camera smoothly followed the position whilst maintain the same rotation.	N/A
Controller Left / Right	• The Left and Right Controller Should Work independently from one another	20/04/20 – When buttons on the controllers where pressed, they where received independently from each other.	This test failed previously, the input manager script was missing the input source parameter.
Controller Position	• When the player moves the controller, the hands/controllers in the game should move • The movement is in the same direction • The movement is the same distance	20/04/20 – When the user moved the controllers the controllers in the game, moved the same distance, they did not feel out of place for the user.	N/A
Controller Rotation	• When the player rotates the controllers, the hand/ controllers in the game should rotate • The rotation is in the same direction • The rotation is the same distance	20/04/20 – When the player rotated the controllers the controllers in the game matched the rotation.	N/A
Controller Button Input	• When the player presses an input on the controller an event should trigger • A button press should trigger a single event • Each button has its own event	20/04/20 – When the user pressed buttons on the controller they updated the data in the input manager script.	N/A
Controller Rebinding	• The user should be able to rebind inputs using the SteamVR interface	20/04/20 – The user was able to customize the binding of actions on their controllers.	When a release version of the game was built the bindings where not exported, to fix this they need to be exported separately with the SteamVR Binding GUI.

Spell Test Cases

Test Name	Expected Outcome	Last Test Outcome	
Spell Equip	• The unequip function for the old spell is executed • The old spell is unequipped from the correct hand • The new spell is equipped to the correct hand • The equip function runs on the new spell	30/04/20 - When a new spell was equipped the old spell was unequipped and the new spell was bound to the correct hand.	N/A
Spell Unequip	• The unequip function for the spell is executed • The spell is removed from the correct hand	30/04/20 – When a spell was unequipped, the unequip function is called and the spell is removed from the correct hand.	N/A
Spell on press event	• When the player starts pressing the input the on-press function is call a single time	30/04/20 – When the player starts pressing the trigger for a single frame the OnPress event is called.	Failed on previous test, was being called every frame, error with input manager class.
Spell on hold event	• When the player holds the input the on-hold function is called every frame	30/04/20 – When the player holds down the trigger, every frame the OnHold event is called.	N/A

Spell on release event	• When the player stops pressing the input the on-release function is called a single time	30/04/20 - When the player releases the trigger for a single frame the OnRelease event is called.	N/A
Spell Cooldown	• When the player casts a spell, it should begin cooldown • When a spell is in cooldown the player should not be able to cast that spell • When the spell has finished cooldown, the player should be able to cast the spell	30/04/20 – When the player casts a spell the time is recorded so the cooldown time can be calculated. The player was not able to cast the spell while it was cooling down.	N/A
Spell Cooldown Ring	• The Ring should appear on the players controllers only when a spell is equipped in that hand • The ring should be white when the spell is ready to cast • The Spell should transition from red to green when the spell is in cooldown • When the player unequips a spell the ring should disappear	30/04/20 – The cooldown ring only appeared when a spell was equipped and was the correct colours for each stage of the cooldown.	Failed on a previous test, the rings where changing colour in reverse, error with parameters in the function.

Trap Spell Test Cases

Test Name	Expected Outcome	Last Test Outcome	Additional Comments
Trap Target	• When the spell is activated a target should appear where the player is pointing • The target should only appear if there is an object to point at • The target should be green when the player can cast the spell • The target should turn red if the player is pointing at an invalid surface • The target should turn red if the target is out of range from the player	01/05/20 – When the spell as activated and the player was pointing at a valid surface a target appeared and was green. When the target was out of range or pointing at an invalid surface it turned red.	Failed on a previous test, the target was also changing size, which is not a desired behaviour, issue was with texture scaling.

Missile Spell Test Cases

Test Name	Expected Outcome	Last Test Outcome	Additional Comments
Spawn Missile	• The missile prefab is spawned • The missile has spawned at the correct location • The missile has the correct rotation • The missile has the correct properties	01/05/20 – When the spell is activated the prefab was spawned with the correct orientation, it also had the correct properties.	N/A

Projectile Test Cases

Test Name	Expected Outcome	Last Test Outcome	Additional Comments
On Update	• The projectile should move forward the correct amount • The projectile should be facing the correct direction • If the missile has gone past its range, it should destroy itself	01/05/20 – Every frame the projectile would move forward with the correct delta and was also facing the correct direction. When the spell had gone past its range it was destroyed.	N/A

On Collision Enter	• If the missile has hit a collider that has health properties it should deal damage to that collider • If the missile has one, an explosion particle should be spawned • If the missile has one, a sound should be played	01/05/20 – When the Projectile collided with a valid surface, it spawned its particle and played the sound. If the collider it hit was a player or an NPC it deducted health.	N/A

Radial Menu Test Cases

Test Name	Expected Outcome	Last Test Outcome	Additional Comments
Visibility	• When the player touches the touchpad, the menu should appear • When the player releases the touchpad, the menu should disappear	02/05/20 – When user touched the touchpad the radial menu appeared and stayed attached to the controller, when the user released there thumb the radial menu disappeared.	N/A
Segment Selection	• When the moves their thump around the touchpad, the correct segment should be activated • Only one segment at a time should be activated	02/05/20 – When the users moved there thumb the correct segment would be activated, and only one segment was active at one time.	N/A
Activate Segment	• When the player presses down on the touchpad, it should activate the event bound to the segment • The activate should only be called once per press • A sound should play to indicate the event being invoked	02/05/20 – When the user pressed down on the touchpad, the event attached to the segment was invoked, and the event was called only once, the correct sound was also played when the user pressed down.	Failed on a previous test because no sound was played when the user pressed down on the touchpad, this was due to a missing reference.

Enemy Test Cases

Test Name	Expected Outcome	Last Test Outcome	
Collison	• The collider for the enemy should collide with other objects in the world • The collider should be in the correct position	25/04/20 - When the software was run the enemy would fall and hit the ground, and the collider was in the correct position	N/A
Character Model	• The model for the enemy should be visible • The model should be in the correct position • The model should be facing the right direction	25/04/20 – When the software was run the character model was visible and animated, it was in the correct position and it was facing the correct direction.	Failed on a previous test as the character model was facing the wrong direction, the offset in the rotation was incorrect so was changed to fix the issue
Movement	• The object for the enemy should move • The movement should be in the correct direction • The movement should be correct speed	25/04/20 – When the software was run and the enemy had a target it would calculate a path to the target and move along that path, it moved along the path at a constant speed and face the direction of movement.	N/A
Turning	• The object for the enemy should rotate • The rotation should be in the correct direction • The rotation should be the correct speed	25/04/20 – When the program was run, and the enemy had a path and not facing the correct direction it would turn to face the current direction. It would turn at a constant speed turned the shortest way to the correct direction.	N/A
Target Acquisition	• If a potential target is within the range of the enemy, and the enemy has line of sight it should make it its target.	25/04/20 – When the program was run the enemy would start looking for targets, when one was within range the enemy would start checking for a line of sight	N/A

		between the target and the enemy, if there was a line of sight, the enemy would set the target as its target.	
Attack	• If the enemy has a target it should try to attack • The enemy can only attack if the target is within range • The enemy can only attack if it has been long enough since its last attack • If the target is out of range the enemy should try to reduce the distance	25/04/20 – When the enemy had a target it would check if it was in its attack range, if it was it would attack the target, it would then record the time of this attack and wait unit enough time had passed for another attack to occur. If the enemy was not within range, it moved to reduce the distance.	N/A
Health is Zero	• If the enemy's health is zero it should run the onDeath function • The enemy should no longer be able to attack • The enemy should no longer be able to move • After the on-death function the enemy should not be visible • The enemy should no longer exist as an object in the game	25/04/20 – After the enemy had been attacked it would check how much health it had and if had not health it would run the onDeath function and was unable to attack the player.	N/A
Navigation	• When the enemy has a target and is moving it should create a path using the nav mesh agent and the nav mesh	25/04/20 – When the enemy was active, it would communicate with the nav mesh component to calculate a path to the target.	

Dungeon Generation Test Cases

Test Name	Expected Outcome	Last Test Outcome	
Dungeon Debug	• A wireframe square should be draw at each occupied tile/ cell of the dungeon. • The size of the square represents the real size of a tile/ cell • The colour of the square should be different for each cell type	26/04/20 – When the dungeon was debugged a square was draw at each cell of the dungeon, all the cells were in the correct place and were the correct colour for the type of cell.	N/A
Adding a Room	• The room should be added to the dungeon data • The information is transferred correctly • The room cannot overlap another room or corridor • The room should be aligned to corridor/ hallway it was added from • The entrance door is marked as an entrance	26/04/20 – When a room was added to the dungeon, all the correct data was stored inside the dungeon data, the overlap checking prevent rooms from being inside one another, the entrance doo for the room was marked as connected and the room was aligned to the grid.	N/A
Adding a Corridor/ Hallway	• The Corridor should start from the door of an existing room • The length of the corridor should be within the limits set by the dungeon settings • The corridor cannot overlap any other rooms or corridors • The Information about the corridor is added to the dungeon data.	26/04/20 – When a corridor was added to the dungeon, it would start from an existing door and attach to another door, it would be the correct length to connect the two rooms and it did not overlap either of the rooms. All the information about the corridor was added to the data about the dungeon.	N/A
Spawning Room Prefabs	• The 3D models for each room is added to the level • The correct set of models are added • The models are alleged to the tile/ cells of the dungeon	26/04/20 – When the 3D models for the dungeon are spawned into the scene, the correct models would be spawned for each room, there were no duplicates, and each model had the correct orientation and position	N/A

	• The models are in the correct position • The models are facing the correct direction		
Spawning Corridor/ Hallway Prefabs	• The model for the corridor is added to the level • The correct number of corridor section are added to match the length • The sections are aligned to the tiles/cells of the dungeon • The sections are in the correct position • The sections are facing the correct direction.	26/04/20 – When adding the models for the corridor, the correct number of segments were added, and they were all facing the correct direction.	N/A
Spawning Door Prefabs	• The model for the door is added to the level • The model is in the correct position • The model has the correct rotation • The correct model for the door is added	26/04/20 – When spawning the prefabs for the doors, the correct prefabs were spawned, and the position and orientation were correct.	N/A

Main Menu Test Case

Test Name	Expected Outcome	Last Test Outcome	Additional Comments
Laser Pointer	• When the player holds the trigger on the right controller a beam should appear and collide with the world and the user interface • When the player lets go of the of the trigger the beam disappears.	04/05/20 – When user pressed down the trigger on the right-hand controller, a laser beam appeared, this beam would end where the player was pointing, when the player let go the beam disappeared.	N/A
Button	• When the laser beam is over a button the button should change colour • When the laser is over a button and the trigger is clicked the button should activate and invoke its event	04/05/20 – When the user pointed at a button it would change colour, and when the user clicked the trigger on the right-hand controller it would activate the button and invoke the event attached to the button.	N/A