Specification: Player Movement

1. Mechanics and Controls

Shadeshifter is meant to be played on a gamepad. The controls are optimized for this particular play style. However, there are also two modes that don't require a gamepad: one that uses the mouse and the keyboard and a final one that only uses the keyboard. During gameplay, the player can switch seamlessly between these different modes by simply using the keys/buttons that work best for them.

In terms of movement, Slate is able to run, jump, and fall through thin platforms. These basic abilities are available from the get-go.

To explore the world of Shadeshifter, the player has to move around in it a lot. This is done using the horizontal axis of the left stick on a gamepad, the left and right arrow keys, or the A and D keys on a keyboard. Slate takes some time to reach his full speed. Likewise, he doesn't come to a full stop immediately. After his velocity passes a certain threshold, the protagonist switches from a walk animation to a run animation. If the player changes direction instead of stopping completely, he retains some percentage of his previous velocity. Slate can walk over edges below a certain height and only falls off slopes of or beyond a certain degree.

Slate is able to jump if the player presses the A-button on a gamepad or the space bar on a keyboard. He launches upwards with a certain force until he reaches the apex where gravity is shortly suspended and the player gains full control over the protagonist's movement, even if only momentarily. During the climb and the fall, the player's control over Slate is greatly reduced. Also, on the way down, the effect of gravity is increased to create a faster fall. However, the maximum fall speed is restricted to a certain value to allow the camera to catch up. The player can press the jump button a little too early or a little too late and the input will be executed nevertheless.

Lastly, there are thin platforms in the game world that are specially marked, either through a tag or a separate collision layer. These platforms don't collide with the player as long as he's moving upwards. Thus, the player can jump through them from below and land on them. Apart from that, the player can press a button to let Slate fall through these platforms if he happens to stand on one. With a gamepad, this is done by holding the D-pad down button and then pressing the A-button. That means that pressing the A-button does not result in a jump if the D-pad down button is currently being pressed. On a keyboard, the same action can be performed by pressing the S key or the arrow key down. Slate continues to fall through these special platforms until the corresponding key or button combination is released.

2. Movement Parameters

2.1 Float – MaxSpeed

The maximum possible velocity Slate can reach while moving horizontally.

2.2 Float – AccelerationTime

The number of seconds it takes Slate to reach his maximum speed while moving horizontally.

2.3 Animation Curve – AccelerationCurve

A curve that represents Slate's changing velocity during the acceleration. The x-axis represents the percentage of time that has passed since the player started pressing the movement button (i.e., 0 = 0 seconds and 1 = AccelerationTime). The y-axis represents the percentage of his maximum movement speed that Slate has at any given moment during the acceleration (i.e., 0 = 0 velocity and 1 = MaxSpeed). This parameter is used to go beyond linear interpolation for the protagonist's acceleration.

2.4 Float – DecelerationTime

The number of seconds it takes Slate to come to a full stop after the player has stopped pressing the movement button.

2.5 Animation Curve – DecelerationCurve

A curve that represents Slate's changing velocity during the deceleration. The x-axis represents the percentage of time that has passed since the player started pressing the movement button (i.e., 0 = 0 seconds and 1 = DecelerationTime). The y-axis represents the percentage of his maximum movement speed that Slate should have at any given moment during the acceleration (i.e., 0 = 0 velocity and 1 = MaxSpeed). This parameter is used to go beyond linear interpolation for the protagonist's deceleration.

2.6 Float – RunningThreshold

The velocity at which Slate switches from a walking to a running animation.

2.7 Float – TurnSpeed (range: 0-1)

The percentage of his previous velocity Slate retains when switching his direction of movement.

2.8 Float – StepHeight (low priority)

The maximum height difference between Slate's feet and an edge that he is still able to walk.

2.9 Float – WalkableSlopeAngle (low priority, perhaps not even necessary)

The maximum angle of a slope Slate is still able to walk on.

3. Jumping Parameters

3.1 Float – JumpForce

The amount of force that is used to launch Slate upwards when the player presses the jump button.

3.2 Float – HangingTime (low priority)

The number of seconds during which gravity is suspended when Slate reaches the apex of his jump. During these seconds, the player has increased control over the protagonist's movement.

3.3 Float – GravityFallMultiplier

A multiplier that increases the effect of gravity on the player while they're falling.

3.4 Float – MaxFallSpeed

The vertical velocity Slate cannot surpass while falling. This is done to avoid issues with the camera or collisions that cannot update quickly enough compared to the protagonist's velocity.

3.5 Float – AirControl (range: 0-1)

The percentage of control the player has on Slate's movement in the air, as compared to his movement on the ground. During the hanging time, Slate is not affected by the AirControl malus for a short time.

3.6 Float – CoyoteDuration

The number of seconds after leaving the ground in which the player can still jump. This does not apply if the player left the ground through a jump already.

3.7 Float – JumpBufferDuration

The number of seconds for which a jump input is stored if the player is currently unable to jump. If the player lands on the ground and there is an entry in the jump buffer, an automatic jump is performed immediately, and the buffer is cleared.

4. Game Feel Parameters

4.1 AudioClip array – FootstepSounds (low priority)

A collection of footstep sounds that are triggered by the walk and run animation of the character. To avoid repetitiveness, the sounds are played in a random sequence and with slight random alterations to the pitch and volume.

4.2 Float – StretchFactor (low priority)

The temporary Y-scale of Slate's sprite when he starts jumping. This stretching creates a more natural look without requiring special animation work.

4.3 Float – StretchDuration (low priority)

The number of seconds for which the stretching is applied before the Y-scale of Slate's sprite is reset to its default value. This duration starts when the player hits the jump button.

4.4 AudioClip – JumpSound (low priority)

The sound that is played when Slate jumps.

4.5 Float – SquashFactor (low priority)

The temporary Y-scale of Slate's sprite when he lands on the ground. This squashing creates a more natural look without requiring special animation work.

4.6 Float – SquashDuration (low priority)

The number of seconds for which the squashing is applied before the Y-scale of Slate's sprite is reset to its default value. This duration starts when the player lands on the ground.

4.7 AudioClip – LandSound (low priority)

The sound that is played when Slate lands on the ground.

4.8 GameObject – LandParticle (low priority)

The prefab of a particle system that is spawned on the ground where the player landed. The particle system is a one-off effect that destroys itself after a few seconds.

4.9 Float – LandVibrationFrequencyL

The low frequency vibration that is applied to the gamepad when the player lands. Rumble effects are created by defining a low and a high frequency for the two distinct rumble motors in modern gamepads.

4.10 Float – LandVibrationFrequencyH

The high frequency vibration that is applied to the gamepad when the player lands. Rumble effects are created by defining a low and a high frequency for the two distinct rumble motors in modern gamepads.

4.11 Float – LandVibrationDuration

The number of seconds for which the rumble effect is upheld when the player lands on the ground.