Agility Pack for Opsive Character Controllers

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Agility Pack

Getting Started

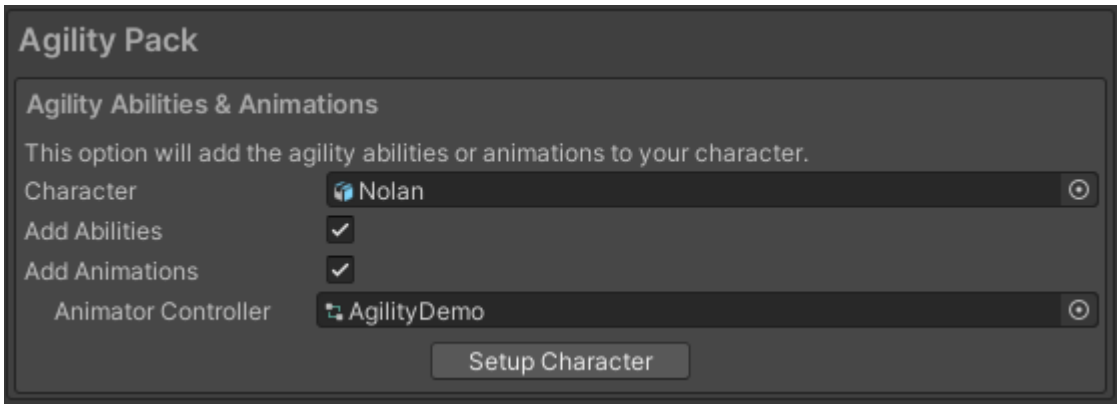
Import Errors

If you receive any import errors after importing the Agility Pack it is likely for one of the two reasons:

- You don't first have one of the Opsive Character Controllers imported. The Agility Pack requires any of the controllers to first be imported in order for it to work.
- The Opsive/UltimateCharacterController/Demo folder is not imported. This directory is required from the character controllers in order for the Agility Pack demo scene to work correctly.

Agility Animations

An editor tool has been created that allows you to easily add the agility animation states to your existing animator controller. You can create the states for all of the abilities used within the Agility Pack by opening the Add-Ons Manager (Tools -> Opsive -> Ultimate Character Controller -> Add-Ons Manager) and specifying the character that you want to add the animations to:



After selecting "Add Animations" all of the agility states will be added to the specified animator controller.

Lightmapping

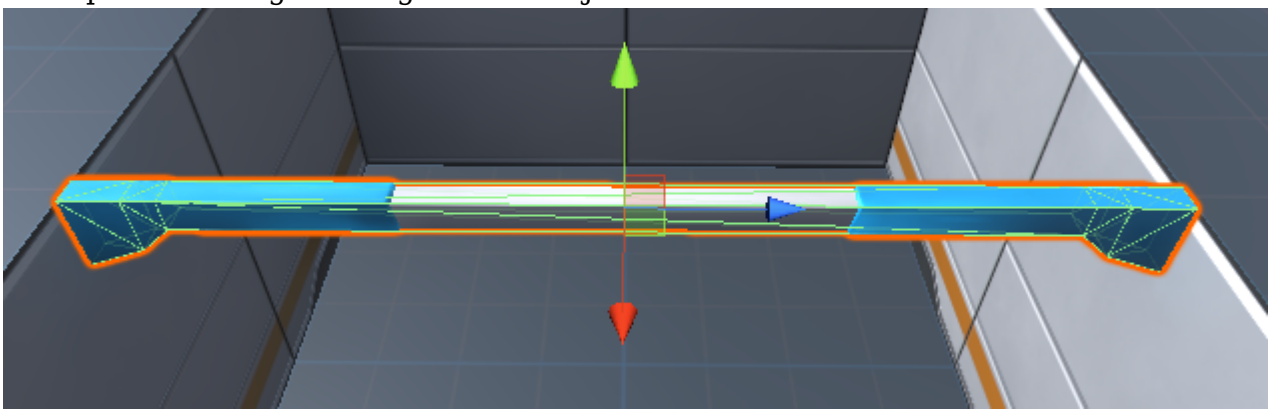
In order to reduce the download size the demo scene does not contain any lightmapping. When the scene first opens it will appear dark and this can be corrected by baking the scene. If the lights are not baked before hitting play they will automatically be disabled.

Balance

The Balance ability will keep the character oriented in the forward/backward direction of a narrow platform. The ability will restrict the character's rotation so they can only move forward or backwards along the object.

Setup

1. Select the + button in the ability list under the “Abilities” foldout of the Ultimate Character Locomotion component.
2. Add the “Agility Pack/Balance” ability. This ability should be positioned near the top of the list so it will override any abilities beneath it.
3. Setup the balance object that the that the character should balance on. The balance object should either be in the specified *Layer Mask* or contain the Object Identifier component with the specified *Object ID*. See the Detect Ground Ability Base class for more information on these parameters. The balance object’s forward direction needs to be pointed along the length of the object:



Inspected Fields

Stop Force Threshold

The horizontal force required to stop the ability.

Stop Force

The amount of force to apply when the ability stops because of the stop force.

Stop Force Frames

The number of frames to apply the force in when the ability stops because of the stop force.

Crawl

The Crawl ability will play a crawling animation with the character moving on all four limbs. If the crawling ability is started by a trigger the ability will not stop until after the character has left the trigger. The Crawl ability is a subclass of the Height Change ability.

Setup

1. Select the + button in the ability list under the “Abilities” foldout of the Ultimate Character Locomotion component.
2. Add the “Agility Pack/Crawl” ability. This ability should be positioned near the top of the list so it will override any abilities beneath it.
3. Set the *State* name to “Crawl” and add the crawl states to other objects that should change values when Crawl is active. In the demo scene the Character IK and Third

Person Object objects have a Crawl state added to them.

4. If the Crawl ability will not be started with a trigger the *Max Trigger Object Count* field should be set to 0.
5. Optionally set the *First End Cap Target* fiend on the Capsule Collider's Capsule Collider Positioner component to the character's reference bone. This will allow the collider to move with the reference bone so the collider will cover the character's feet when crawling. This reference bone follows the movement created within the crawl animations.

Inspected Fields

Crawl Active State Name

The name of the state that should activate when crawl is active. Crawl will not be active when the ability is playing the stop animation.

Max Trigger Object Count

The maximum number of valid triggers that the ability can detect. Set to 0 to prevent the ability from starting with a trigger.

Trigger Layer Mask

The LayerMask of the trigger that should be detected.

Trigger Object ID

The unique ID value of the trigger's Object Identifier component. A value of -1 indicates that this ID should not be used.

Dodge

The Dodge ability will allow the character to quickly dodge left, right, forward or back in order to avoid an attack.

Setup

1. Select the + button in the ability list under the “Abilities” foldout of the Ultimate Character Locomotion component.
2. Add the “Agility Pack/Dodge” ability.
3. If *Require Target* is true the Aim Assist component needs to exist on the look source.

Inspected Fields

Double Movement Start

Should the ability start when the movement input is pressed, released, and then pressed again?

Double Movement Timeout

The double movement history will timeout after the specified number of seconds.

Require Aim

Does the character need to be aiming in order to dodge?

Require Target

Does the character need to have a target in order to dodge? The Aim Assist component is required if this value is true.

No Velocity Direction

The direction that the ability should dodge if the character isn’t moving.

- *Left*: The character should dodge left.
- *Right*: The character should dodge right.
- *Forward*: The character should dodge forwards.
- *Backward*: The character should dodge backwards.
- *None*: The character should not dodge when there is no velocity.

Hang

The Hang ability allows the character to hang from flat objects. The hang ability is NOT able to climb up any object and is only designed for hanging. While hanging the character can:

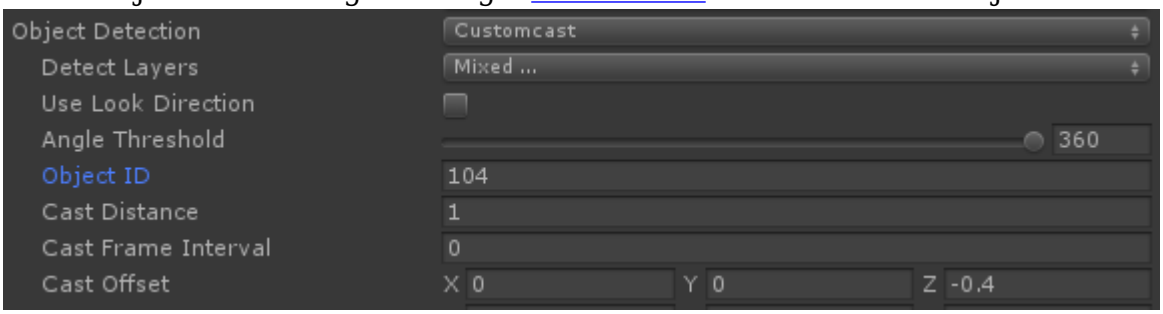
- Start hanging from the ground or mid jump/fall.
- Start hanging by dropping down onto the hang object.

- Shimmy.
- Shimmy across curved objects.
- Transfer to another hang object in the vertical or horizontal direction.
- Pull up from a hang and stop the ability.

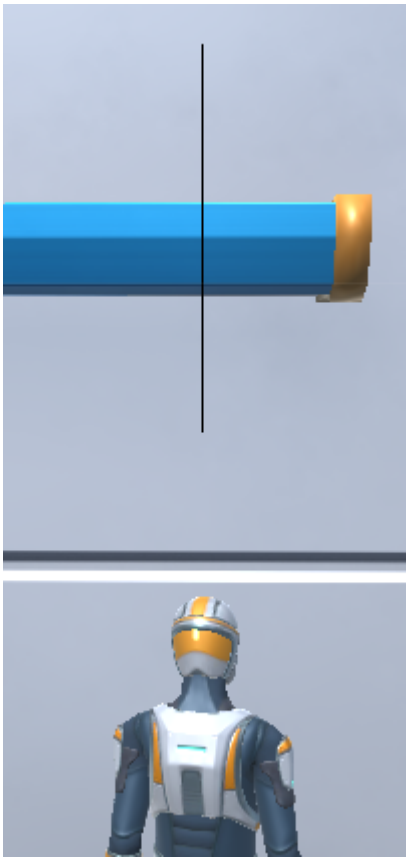
Hanging involves just the use of the character's arms and it is not meant for the character to be able to free climb with their feet as well.

Setup

1. Select the + button in the ability list under the "Abilities" foldout of the Ultimate Character Locomotion component.
2. Add the Hang ability. This ability should be positioned near the top of the list so it will override any abilities beneath it. The Hang ability should be above the Fall ability.
3. Ensure the hang animations have been added to the character. All Agility Pack abilities can be setup through the Add-Ons Manager or by selecting the "Build Animator" button under the Editor foldout of the Hang ability.
4. Determine how the Hang ability should detect any hang objects. The Agility Pack demo scene adds an Object Identifier to each hang object and then the Hang ability detects which object it can hang on using a custom cast based off of the Object Identifier ID:



5. Setup each hang object to be detected by the Hang ability. For the demo scene the Object Identifier component was added with an ID of 104.
6. Modify the Hang's *Minimum Start Offset* and *Maximum Start Offset*. This offset specifies the range that the Hang ability should detect other hang objects. In the screenshot below the vertical offset is shown with the black debug line. The bottom of the line is represented by the y value of the *Minimum Start Offset,* and the top of the line is represented by the y value of the *Maximum Start Offset*. Debug lines can be drawn if *Draw Debug Lines* is enabled. The black line in the image below represents the cast area which determines if Hang can start.



7. Modify the *Relative Hang Offset*. This value represents the distance that the character should be placed away from the hang object while in a shimmy position.
8. The remaining fields should work well at their default values. See the Inspected Fields below for a description of each field.

Inspected Fields

Draw Debug Lines

Should debug lines be drawn to the editor indicating the location of the horizontal and vertical casts?

Allowed Movements

Specifies which hang movements the character can perform.

- *DropDown*: The character can drop down from above the hang object.
- *TransferUp*: The character can transfer vertically from one hang object to another.
- *TransferHorizontal*: The character can transfer horizontally from one hang object to another.
- *PullUp*: The character can pull themselves up to end the ability.
- *DropToStop*: The character can drop to stop the ability.
- *StartFromHorizontalClimb:* The character can start hanging from a horizontal climb position. This movement requires the Climbing Pack.
- *StartFromVerticalClimb:* The character can start hanging from a vertical climb position. This movement requires the Climbing Pack.

Minimum Start Offset

The minimum offset from the character's pivot that the ability can perform a movement.

Maximum Start Offset

The maximum offset from the character's pivot that the ability can perform a movement.

Relative Hang Offset

The offset from the top of the character to the hang object.

Start Move Towards Speed

The speed that the character moves towards the starting position.

In Position Shimmy Distance

The character can shimmy when the vertical distance between the character and hang object is less than the specified amount.

In Position State Name

The name of the state when the character is in hang position.

Move Up Button Name

The name of the button that will transfer or pull the character up to the next hang state.

Change State Sensitivity

Specifies how sensitive the ability is when determining the next state. A value is 0 is the most sensitive while a value of 1 is the least.

Shimmy Offset

Offset to detect hang objects when shimmying.

Hand IK Offset

Offset to apply to the hand position relative to the object hit at the hands position.

Pull Up Cast Distance

The distance that should be checked to determine if the character can pull up without any obstructing objects.

Stop Hang On Jump

Should the ability stop if the jump button is pressed?

Start Climb Offset

The offset used to check for a valid hang object if a climbing ability is active. This field will appear when the Climbing Pack is installed.

Start Vertical Climb Offset

The offset used to check for a valid hang object if the character is moving vertically with the free climb ability. This field will appear when the Climbing Pack is installed.

Ledge Strafe

The Ledge Strafe ability will play a strafing animation while the character is on a ledge. This ledge should be narrow to prevent the character from being able to walk normally across it. A wall must exist on one side of the ledge that the character can lean against.

Setup

1. Select the + button in the ability list under the “Abilities” foldout of the Ultimate Character Locomotion component.
2. Add the “Agility Pack/Ledge Strafe” ability. This ability should be near the top of the ability list so it overrides any lower priority ability.
3. Set the *State* name to “LedgeStrafe” and add the crawl states to other objects that should change values when Ledge Strafe is active. In the demo scene the Character IK and Capsule Collider Positioner components have a LedgeStrafe added.
4. Setup the ledge that the character can strafe on. The ledge object should either be in the specified *Layer Mask* or contain the Object Identifier component with the specified *Object ID*. See the Detect Ground Ability Base class for more information on these parameters.
5. A solid object should exist on one side of the ledge that the character can lean against.

Inspected Fields

Detect Wall Distance

The distance to detect a wall before the ability can start.

Horizontal Start Offset

The distance to check to the left and right of the initial wall position to determine if location is a valid starting position.

Wall Offset

The distance that the character should stand away from the wall.

Gap Offset

The distance away from the wall that the gap exists.

Can Start Gap Offset Cast Radius

The radius of the cast when determining if a gap exists and the ability is determining if it can start.

Active Gap Offset Cast Radius

The radius of the cast when determining if a gap exists and the ability is active.

Start Move Towards Wall Speed

The speed that the character should move towards the wall when starting.

Stop Force

The amount of force to apply when the ability stops from input or the jump ability. This will push the character away from the wall.

Stop Force Frames

The number of frames to apply the force in when the ability stops from input or the jump ability. This will push the character away from the wall.

Roll

The Roll ability allows the character to play a rolling animation. A rolling animation can also play if the character falls from a tall object. While in first person view the camera can roll with the character, stay in an upright rotation, or switch to a third person perspective.

Setup

1. Select the + button in the ability list under the “Abilities” foldout of the Ultimate Character Locomotion component.
2. Add the “Agility Pack/Roll” ability. This ability should be positioned above the Fall ability so the character will keep rolling even while in the air.
3. Set the *Roll Fall Height* if the character should start to roll after falling from a large distance.

Inspected Fields

Start Cast Distance

Specifies the cast distance to ensure there is enough space for the character to roll.

Roll Fall Height

Start the roll ability if the character falls from a height greater than the specified value. Set to -1 to disable the falling roll.

Switch To Third Person

Should the roll ability switch to a third person view if the character is in a first person view?

Vault

The Vault ability will allow the character to traverse over a vertical object.

When the Vault ability begins the AbilityFloatData Animator parameter will specify the forward velocity of the character. This can be used within a blend tree to play different vaulting animations based on the speed. The AbilityIntData parameter specifies the height of the vaulting object. This allows different vault animations to play based on the vault height. Because AbilityIntData is an int the height value is multiplied by 1000 to allow for a high precision while still being stored within an int parameter. For example, if the vault height is 1.53 units tall then the AbilityIntData will be 1530.

Setup

1. Select the + button in the ability list under the “Abilities” foldout of the Ultimate Character Locomotion component.
2. Add the “Agility Pack/Vault” ability. This ability should be positioned near the top of the list so it will override any abilities beneath it.
3. Setup the objects that the character can vault over. If the object can be detected by a cast ensure it uses a layer included within the Vault’s *Detect Layers* field. If an ID can be used the Object Identifier component should be added to the vault object. The ID specified by the Object Identifier component should match the Vault’s *Object ID* field.
4. Ensure the *Object Detection* field is set to the correct detection method. If a cast is used the *Angle Threshold* should also be set. This value indicates the angle at which the vault ability can start and a good value for vault is under 30.
5. No other steps are required once the vaulting objects and the Vault ability has been setup.

Inspected Fields

Max Height

The maximum height of the object that the character can climb over.

Start Location Depth Offset

Adds to the vault object’s offset.z value to allow the ability to play sooner when the character is running versus walking. The x value represents the character’s z velocity while the y represents the amount to add the Ability Start Location’s depth offset value by.