Easy SpringBone QuickStart Guide

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1. Overview

The **Easy SpringBone** is an asset for Unity 2D Animation package. It provides spring effect to bones, to achieve hanging objects like rope or something with elasticity like jelly.
For more information about the 2D Animation package, please follow this link.
https://forum.unity.com/threads/2d-animation-is-out-of-preview-for-2019-3.818724/

For a quick start, you can watch this video.
https://youtu.be/lNHU6pIhRbw

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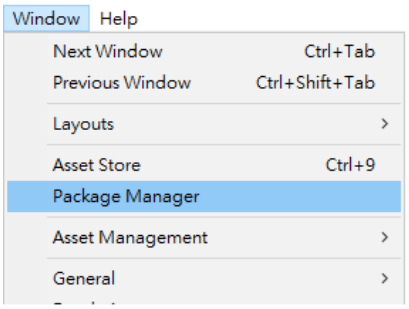
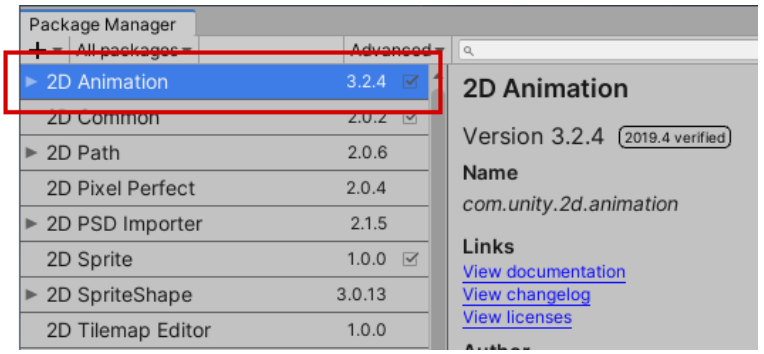
2. Setup

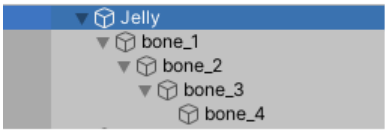
Setting **Easy SpringBone** is quite easy and only requires a few steps. It's recommended to backup your project before installing **Easy SpringBone**.

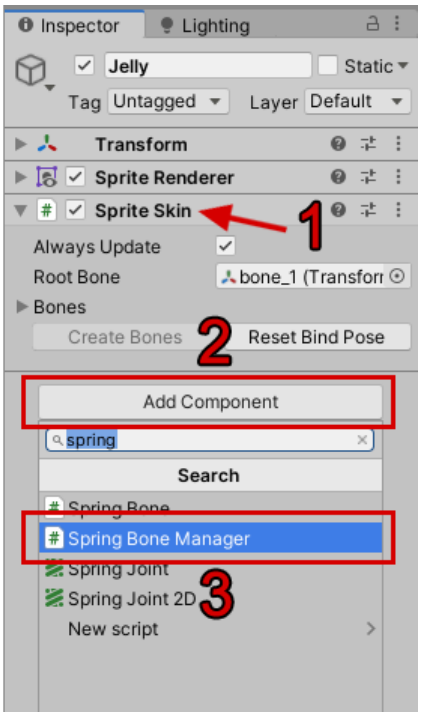
1. Make sure you have installed the Unity 2D Animation package.



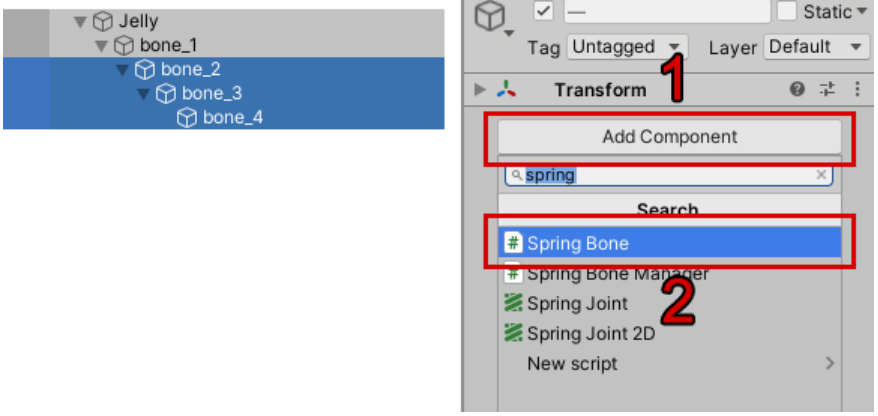


2. Select the sprite with the "Sprite Skin" component attached. Add the "SpringBoneManager" component to it.





3. Select bones that need SpringBone effect. Add the “SpringBone” component to them.

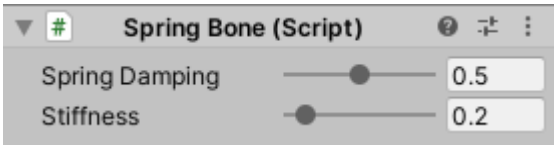


4. That’s it.

3. SpringBone Component

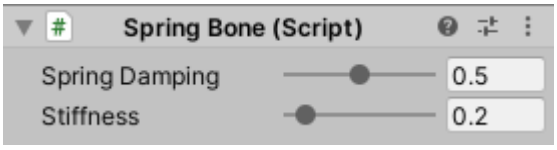
3.1. Spring Damping

Control the degree of elasticity. The smaller the value, the greater the swing back and forth.



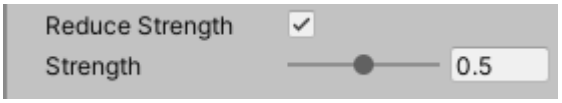
3.2. Stiffness

The degree of stiffness can also be regarded as the toughness of an object. The lower the value, the softer, the higher the harder.



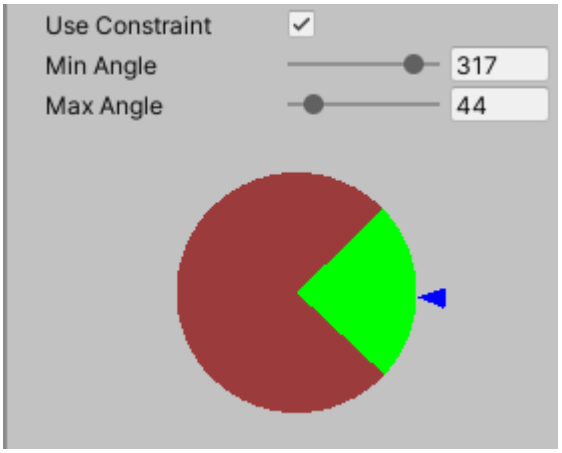
3.3. Strength

Control the overall strength. If you feel the effect of SpringBone is too strong, use "Strength" to modify it. The smaller the value, the lower the effect. It is usually recommended to turn it off to save some calculations.



3.4. Constraint

This is an advanced feature. You can limit the movement of bones within a certain range. “MinAngle” and “MaxAngle” determine this range. It is recommended to observe the value from the pie chart below. The green part represents the movable range, the red part represents the non-movable range, and the blue arrow represents the current position of the bone. This will require some calculations, only use constraint when you really need it.



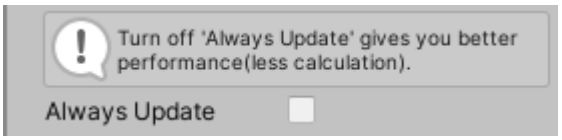
3.5. Ignore Spring Bone

Temporarily disable the SpringBone effect, and the bones will be immobile. This can be used in some situations, such as when the character is frozen.

4. SpringBoneManager Component

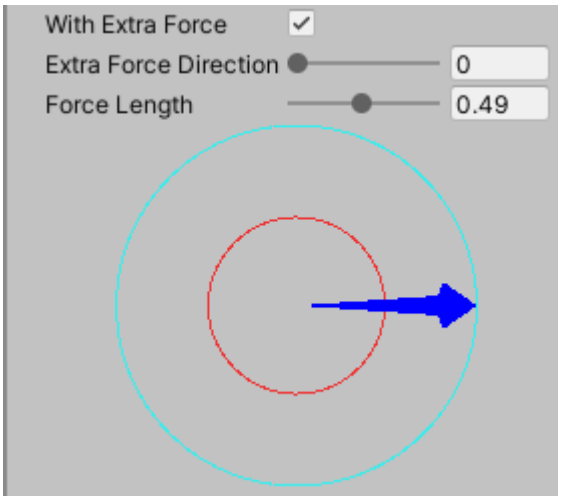
4.1. Always Update

Enable “Always Update” if you need to change the properties (such as Stiffness or Extra Force) of SpringBone during run time. This will increase the amount of calculation per frame, so only use it when you need it.



4.2. Extra Force

Extra Force provides a force from the world. Simulate something like wind or gravity. “Extra Force Direction” represents the angle of force, and “Force Length” represents the strength of the force. It is recommended to observe the value from the visual graph below. The cyan circle represents max force can be applied. The red circle represents the current force. The blue arrow represents the direction of force.



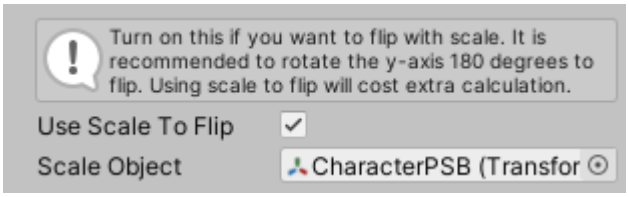
5. FAQ

5.1. How do I flip my object?

There are two ways to flip the object.

The first way is to rotate the y-axis 180 degrees, and all SpringBone effects will be flipped accordingly.

The second way, using the x-axis scaling to -1. To use scale, you must enable the scale option in SpringBoneManager and specify the scale object.



These two ways cannot be used together because they use different calculations. It's recommended to flip with rotation because it needs less calculation (better performance).

This video demonstrates how to do it.

https://youtu.be/sqZjc6D20lw

5.2. What is the best way to adjust properties?

The most effective way is to enable "Always Update" in play mode, and then adjust properties (such as Spring Damping, Stiffness, or Strength, etc) until you feel satisfied with the effect. Write down the values of these properties, and set them back after exiting play mode.

5.3 Can I use a script to control SpringBone?

Of course you can. Please check the scene of demo3 and demo4, they demonstrate how to do it.

5.4 Does it support URP?

Easy SpringBone itself has nothing to do with URP, so yes, it supports URP. But the wind particle effect in the demo scene uses the built-in shader. If you use URP, please upgrade the wind effect material to URP shader.
Operation: Edit --> Render Pipeline --> Universal Render Pipeline --> Upgrade Project Materials to UniversalRP Materials