Super Softbodies Readme

Guaranteed Softer Meshes

Overview

[Online Version](#)

This package is designed with flexibility and allows you to integrate high performing softbody systems into any project. We are simulating how softbodies behave with the use of Nodes (each one acting like a spring).

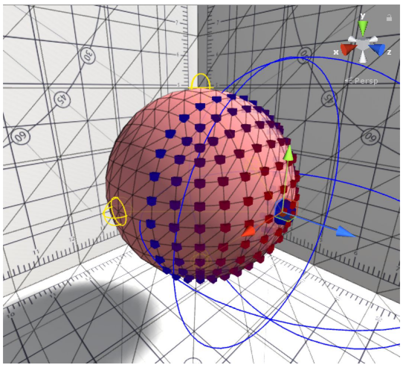
Support

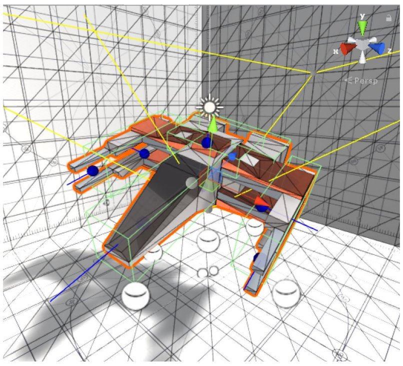
Please email info@turbokiwi.com for all support queries. We will aim to respond within 24 hours.

Quick Start

Due to the complexity of this system, this quickstart guide is only to explore the package, you will need to play with a lot of variables to set up objects perfectly.

- **Bouncy Ball** - This example demonstrates a basic setup that is relatively fast but still uses a damper for better looking collisions.
- **Jelly Cube -** Here we have a more dynamic setup that uses much more nodes than our other examples.
- **Squish Ball** - A high performance, but still dampened setup. We are able to create a lot of these due to their simplicity.
- **Spaceship Softbody** - This example is the more typical to include in your game. The nodes affect both the mesh and the compound colliders.
- Selecting an object displays all the nodes on it. You can then select a node to display more information about it, including the affecting vertices.
- When you run the scene, use the slider to test how the node affects the mesh.





You must **Bake** all changes on the root Softbody component.

Softbody Setup

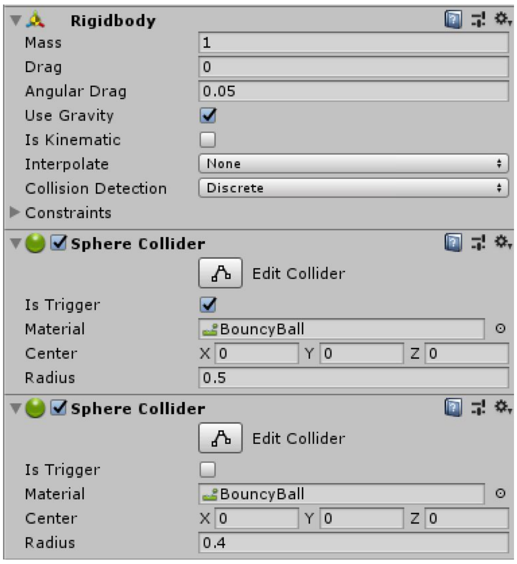
Our root object requires some setup to work correctly. Items marked with (Damping) are only required if the **SoftbodyDamper** system is integrated.

Core Collider

This object will act as our core, and works as usual with the Unity Physics System.

Soft Collider (Damper)

Just a usual Unity Trigger Collider, once it collides with an object, our **SoftbodyDamper** system will react to the collision and attempt to slow the object down.



Rigidbody

Mass	1
Drag	0
Angular Drag	0.05
Use Gravity	☑
Is Kinematic	□
Interpolate	None
Collision Detection	Discrete
Constraints	

☑ Sphere Collider

	Edit Collider
Is Trigger	☑
Material	BouncyBall
Center	X 0 Y 0 Z 0
Radius	0.5

☑ Sphere Collider

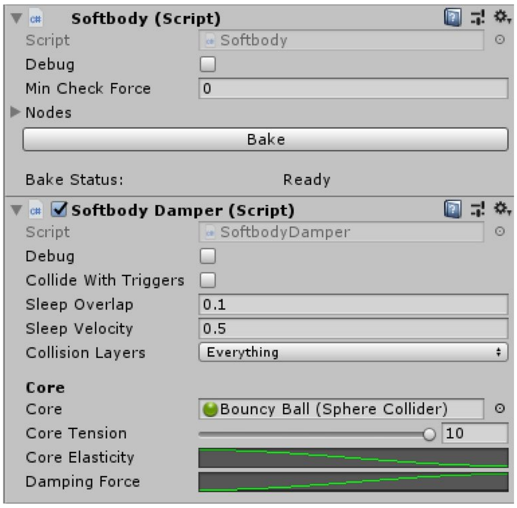
	Edit Collider
Is Trigger	□
Material	BouncyBall
Center	X 0 Y 0 Z 0
Radius	0.4

Softbody

Collision messages are fed through the softbody into the nodes. We also Bake our nodes from here when any changes are made.

SoftbodyDamper (Damper)

This component overrides the Softbody collision systems and creates dynamic movements for the nodes. It converts trigger messages into collision messages and feeds them into the Softbody component (then to the nodes).



Softbody (Script)

Script	Softbody
Debug	□
Min Check Force	0
Nodes	
Bake	
Bake Status:	Ready

☑ Softbody Damper (Script)

Script	SoftbodyDamper
Debug	□
Collide With Triggers	□
Sleep Overlap	0.1
Sleep Velocity	0.5
Collision Layers	Everything
Core	
Core	Bouncy Ball (Sphere Collider)
Core Tension	10
Core Elasticity	
Damping Force	

Softbody Node

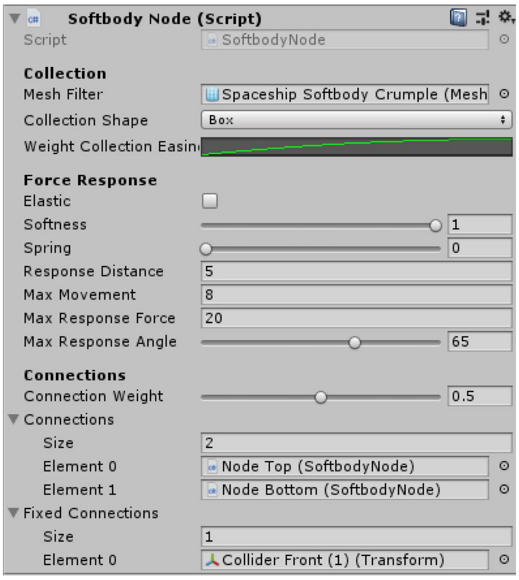
This is where we control the vertex movements. The nodes can affect Mesh Colliders and Mesh Filter. The node will move along its forward axis only, and is restricted by the **Max Movement** value.

Weight Collection Easing will describe how we affect the nodes. This will need testing as each object will require a different curve,

Elastic toggle is only if SoftbodyDamper is used, and will allow the node to compress and decompress.

Softness will limit the movement of the node, even if the max force is applied to it.

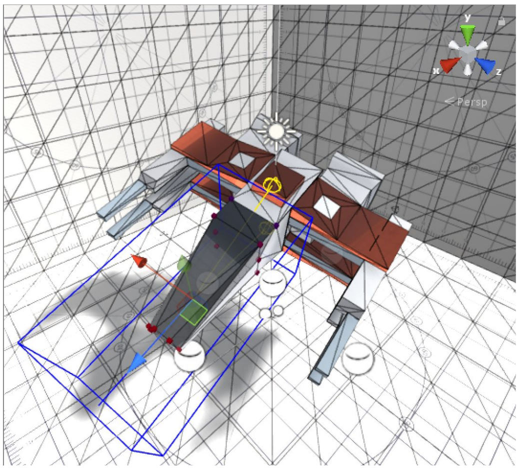
Spring will make the node spring back into default position by itself.



Softbody Node (Script)

Script	SoftbodyNode
Collection	
Mesh Filter	Spaceship Softbody Crumple (Mesh
Collection Shape	Box
Weight Collection Easin	
Force Response	
Elastic	□
Softness	1
Spring	0
Response Distance	5
Max Movement	8
Max Response Force	20
Max Response Angle	65
Connections	
Connection Weight	0.5
Connections	
Size	2
Element 0	Node Top (SoftbodyNode)
Element 1	Node Bottom (SoftbodyNode)
Fixed Connections	
Size	1
Element 0	Collider Front (1) (Transform)

SoftbodyNode (continued)



Our nodes can also affect one another with the connections.

Connections describes other nodes that we want affected by this one. Our Bouncy Ball example uses this to extrude the sides of the object when compressing the bottom.

Fixed Connections are objects we want to move directly with the node. Our Spaceship example uses this to move the compound colliders when the nodes are compressed, this way we can have a dynamic shape interacting with the physics engine.

SoftbodyJobManager

Our job manager will limit the amount of updates done per frame, with exception to priority objects who will run on the frame after they become priority.

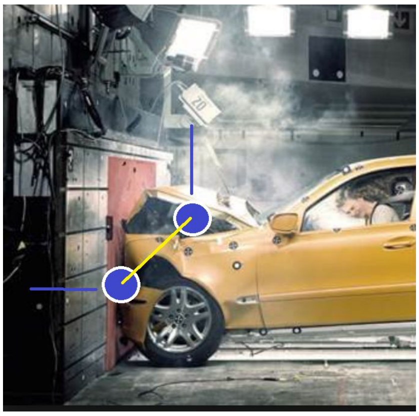
Advanced Details

The systems are designed to simulate softbodies, we therefore sacrifice visual details and approximate movements using our nodes.

Mesh Colliders

You can integrate mesh colliders into the softbody system as well, these will require their own nodes however. We must do this because a mesh collider is typically optimized and not the same as the rendering mesh.

Crumple Zones

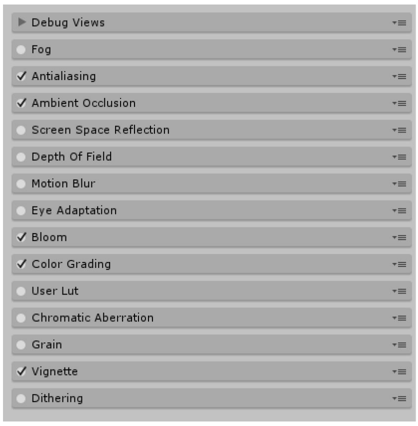


Crumple zones can be created using nodes perpendicular to the affected node. So you might have a node on the bonnet of a car pointing up, and the node on the front of the car connecting to it. The connection will apply force to it, but the bonnet node will move along its own axis.

Post Processing

The package screenshots included a heavy post processing stack, this has been left out of the package but can easily be re-implemented if desired.

Just copy the toggle boxes in this image and you can achieve the same look.



▶ Debug Views
○ Fog
✓ Antialiasing
✓ Ambient Occlusion
○ Screen Space Reflection
○ Depth Of Field
○ Motion Blur
○ Eye Adaptation
✓ Bloom
✓ Color Grading
○ User Lut
○ Chromatic Aberration
○ Grain
✓ Vignette
○ Dithering

Bubblegum

The Bubblegum framework is a flexible framework designed for Unity3D. The scripts and shaders in this pack are available free to use:
https://bitbucket.org/alexisrabadan/bubblegum

Credits

Creative Commons Licence
Various models by Kenny http://kenney.nl/
Calibration Assets by Unity3D https://www.assetstore.unity3d.com/en/#!/content/25422

THE END