

PhysSound v2.3.0

Created By Kevin Somers

Contents

PhysSound Overview	2
PhysSound Material Types.....	2
PhysSound Materials	3
General Properties	3
Material Type	3
Pitch Randomness.....	3
Slide Pitch Mod	3
Relative Velocity Threshold	3
Impact Normal Bias.....	3
Use Collision Velocity.....	4
Scale Impact Volume.....	4
Audio Sets	4
Fallback Audio Set	4
Material Type	4
Impact Clips.....	5
Slide Clip.....	5
PhysSound Objects.....	5
PhysSound Material	5
Audio Sources	5
Auto Create Sources	6
Use PlayClipAtPoint.....	6
PhysSound Terrain	6
Scripting	7
PhysSoundObject	7
SetEnabled	7

PhysSound Overview

The PhysSound system adds the ability to bring your physics to life through the use of impact and sliding sounds. The system works with both 2D and 3D physics.

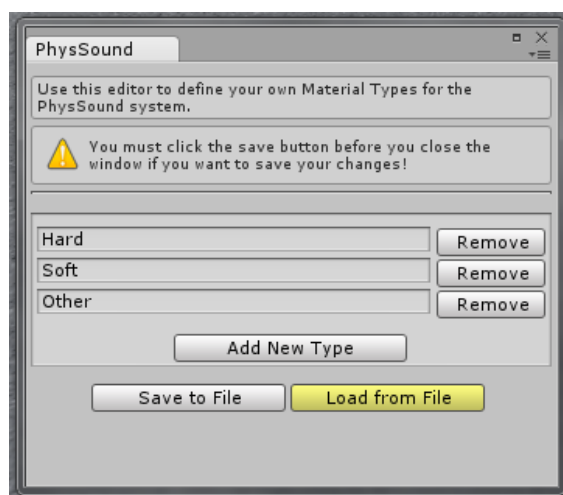
There are 3 parts of the system: PhysSound Material Types, PhysSound Materials, PhysSound Objects.

PhysSound Material Types define the base set of different kinds of objects. PhysSound Materials define the properties that regulate interactions between objects. PhysSound Objects are components that manage the material and audio sources used by the objects.

PhysSound Material Types

Material Types are the core of the PhysSound system. They allow for distinctions between different kinds of objects, resulting in more versatile and realistic interactions.

The PhysSound Material Type Editor allows you to define your own material types. You can find this editor under **Window/PhysSound**.



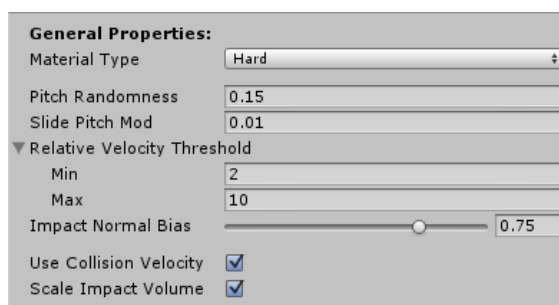
These types can be named anything you want, as long as there are NO duplicate names. In order to save your changes, you MUST click on the "Save to File" button. If you want to undo your changes, click the "Load from File" button.

Once you have defined these types, you can use them in your PhysSound Materials, which will be explained next.

PhysSound Materials

PhysSound Materials establish the different properties that regulate interactions between objects. They also hold all of the audio data that will be played. To create a new PhysSound Material navigate to Assets/Create/PhysSound Material, or right click your Assets window and navigate to Create/PhysSound Material.

General Properties



Material Type

The Material Type is whether the material is hard or soft. This list is the same list that you defined in the Material Type Editor.

Pitch Randomness

If desired, the pitch of both the impact and sliding sounds can be randomized by the given amount, reducing the chance of similar sounds overlapping.

Slide Pitch Mod

This value determines how much the velocity of a sliding object effects the pitch of the sound. That is, objects sliding faster will have higher pitched sliding sounds. This value should generally be very low (less than 0.1 in most cases), and tends to make more sense for rolling objects.

Relative Velocity Threshold

The relative velocity of a collision (i.e. the impact and sliding force) is an integral part of how this system determines how to play sounds.

The Min value is the minimum velocity required to play a sound. The Max value is the maximum velocity needed to play a sound. For example, using the numbers above, if an object is sliding across a surface at a speed of 2 the slide sound volume will be 0. If it is sliding at a speed of 10, the slide sound volume will be 1.

The system also determines which sounds to play based on the collision's velocity relative to the given Min and Max values, if Use Collision Velocity is checked.

Impact Normal Bias

PhysSound takes into account a surface's normal versus the collision's velocity direction when calculating what sounds to play. So for example, an object that hits a surface at a 90 degree angle will be seen as more forceful than an object that strikes a surface at a 30 degree angle.

This value determines how much emphasis is put on the collision normal, where 0 means the normal is not taken into account at all, and 1 means it is fully taken into account. A value close to 0 will produce loud impact sounds when an object hits at a low angle, and a value close to 1 will do the opposite.

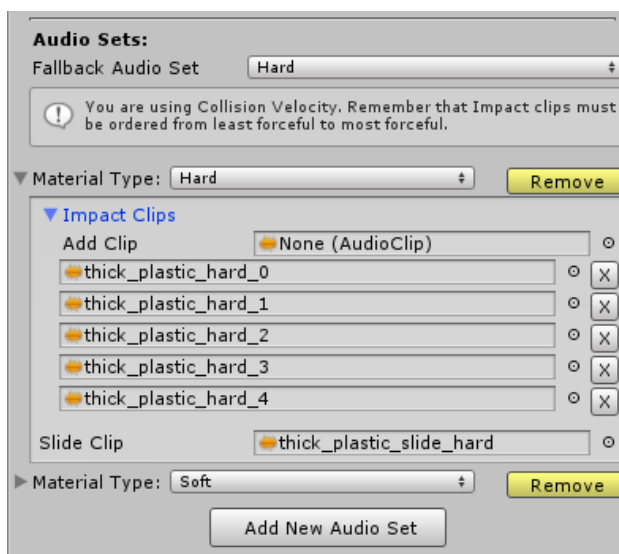
Use Collision Velocity

If this is checked, you can order your impact sounds based on the force of an impact. This means that a different sound will be played based on how hard one object strikes another. Otherwise sounds will be chosen at random.

Scale Impact Volume

If this is checked, the volume of the impact will be modified based on the impact force, further reducing the chance of similar sounding sounds playing. Otherwise all sounds will be played at the same volume.

Audio Sets



**** Any of the AudioClip fields can be left blank if desired.***

Fallback Audio Set

Specifies the Audio Set that should be used when an object a) collides with an object who's Material Type does not have a matching Key, or b) collides with an object that doesn't have a PhysSoundMaterial assigned to it.

Material Type

This defines what Material Type this audio set is associated with. Using the above as an example, whenever this object collides with an object whose PhysSound Material Type is "Hard", the audio set with the Material Type "Hard" will be used.

Impact Clips

Impact Clips are played when one object strikes another. You can specify multiple impact sounds.

If you are using Collision Velocity, these audio clips should be sorted from least forceful to most forceful, and the system will choose which sound to play based on the force of the collision. As a general rule, you shouldn't have more sounds than your threshold can accommodate for. That is, if the Min and Max of the threshold are 2 and 7, that means there can be a maximum of 6 impact sounds.

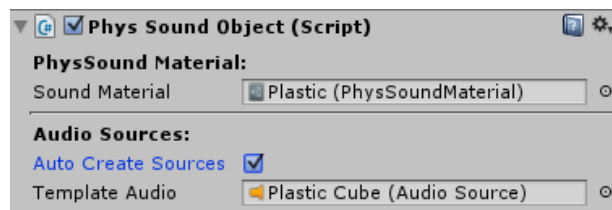
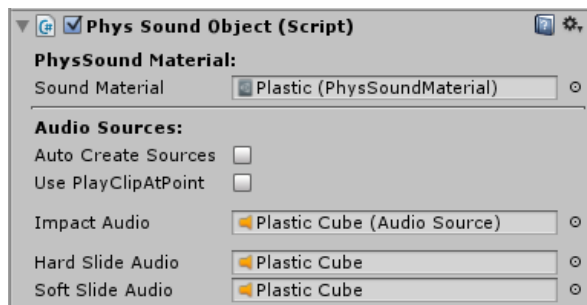
If you are not using Collision Velocity, sounds can be in any order and one will be chosen randomly upon each collision.

Slide Clip

The Slide Clip is played when one object rubs against another. These audio clips should be looping sounds.

PhysSound Objects

In order to make your objects use PhysSound Materials, you must attach a PhysSound Object component to the object. This component manages interactions between objects and manages the AudioSources used to play the sounds. To add this component to your objects, use the AddComponent button and navigate to PhysSound/PhysSound Object.



PhysSound Material

The PhysSound Material applied to this object determines how it behaves when interacting with other objects.

Audio Sources

PhysSound Objects use several audio sources to play the impact and sliding sounds specified in the material.

The Impact Audio Source is used to play all impact sounds. Each audio set defined in the Sound Material must have its own Slide Audio source in order to play the sliding sounds correctly (as well as have more than one slide sound play at once). The list of Slide Audio sources will be automatically updated to match the audio sets of the Sound Material.

Auto Create Sources

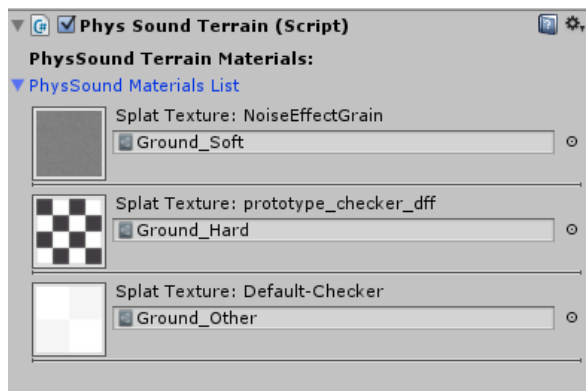
If you wish, you can let PhysSound create these Audio Sources automatically when the scene loads by selecting Auto Create Sources. You can then specify a template Audio Source to use values from.

Use PlayClipAtPoint

Normally, a single AudioSource is used to play all impact sounds. But this can lead to sounds getting cut off when impacts happen in rapid succession. PlayClipAtPoint instantiates a new AudioSource every time an impact sound is played, and destroys it automatically when the sound is done playing, so a sound will never be cut off. ***You should use this option with caution, as you don't want to be instantiating and destroying a lot of objects rapidly.***

PhysSound Terrain

The PhysSound system also has the ability to apply materials to a terrain, and play sounds based on the splatmap of the terrain. To add this component to your objects, use the AddComponent button and navigate to PhysSound/PhysSound Terrain.



Each splat texture on a terrain has a PhysSound Material assigned to it. Whenever you add or remove a texture from the terrain, the list of materials will be updated as well. There will always be the same number of materials as splat textures. A material slot can be empty if desired.

Scripting

Generally speaking, PhysSound is a very closed system that requires little to no scripting on the user's part. However, there are some functions that may be useful, which are described here.

PhysSoundObject

SetEnabled

Enables or disables this script and its associated AudioSources. Useful for optimization, such as disabling the script and AudioSources when the player is far away.

Parameters:

- **Enable (bool):** Whether to enable or disable this object.
-