Dynamic Footsteps Audio System

- 5652 Sound Files
- 440 Sound Cues
- 2 Footwear Sets
- 13 Surface Types
- 2 Sample-rate Sets

EPIC MegaGrants RECIPIENT

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Easy Setup and Output

Easy setup allows the plugin to be used for motion capture, key framed, physics and ragdoll animation systems. Audio output functions in standard playback mode as well as when rendering from Unreal Engine for linear production.

Complete Realism

Human footsteps are far more than just walking so the articulation sets help create a more realistic sound for your characters.

There is a wide range of surface types supported within this system. The articulations are automatically triggered as part of the Blueprint functionality but we also include additional articulations to expand upon the core set and to maximise the user's options.

The initial set includes two shoe types; combat boots and sneakers. We have found that a hard shoe option and a soft shoe option cover the bulk of most use cases. Additional shoe types will be added at a later date.

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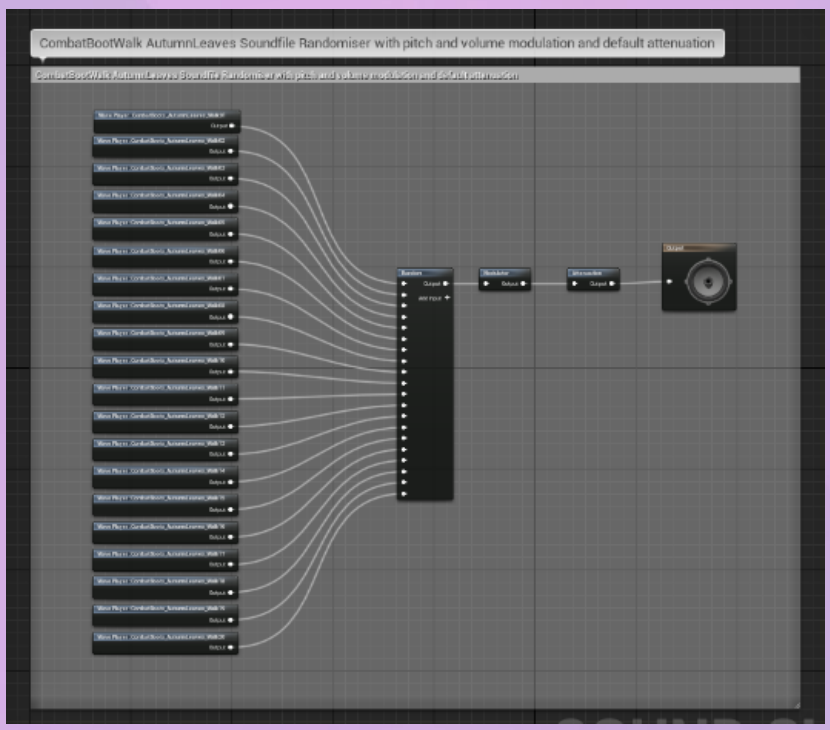

The huge range of sound files for each sound cue to randomly select from completely avoids noticeable repetition.

Functionality

Linking is simply a case of adding the plugin to the feet of any character model (this plugin does not care how many feet a model has; it is limited only by performance needs). The plugin then tracks the movement of any character that is linked to the plugin. The plugin tracks the impact speed and rotation of the feet and triggers the appropriate sound based on shoe and surface type.

This plugin includes a default Attenuation object for the assets, which provides reasonable sound drop-off within the 3D space. This can be tweaked to suit any project and multiple attenuations could be assigned across the asset sets.

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Surface Types
Autumn Leaves
Bitumen
Carpet
Deep Water
Hard Dirt
Long Grass
Metal Grill
Scrub
Shallow Water
Short Grass
Snow
Wooden Bridge
Wooden Floor

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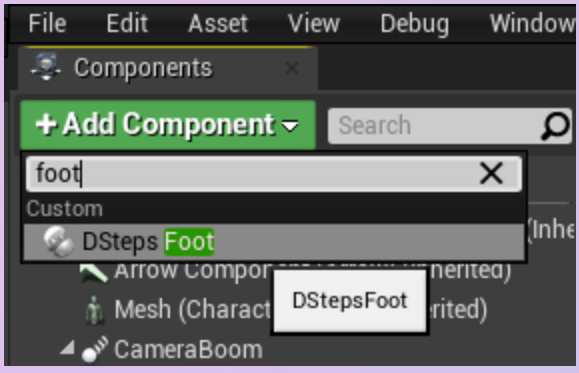
Installation

Unzip the contents of the .zip file into **[your project folder]/Plugins/Runtime/DynamicFootsteps** and then start up the Unreal Editor with your project.

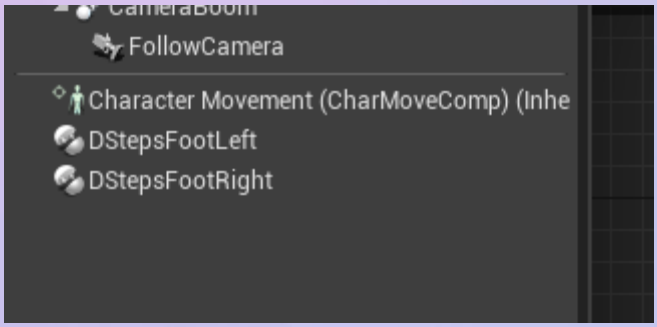
Quick Setup

For a quick setup with just the default terrain type (hard dirt), you can leave the plugin settings alone and just add the foot components to the character.

First add **DSteps** Foot components to the character that needs footstep sounds.



The character will need as many of these components as they have feet.



Next, tell each foot component which bones (or sockets) on the skeletal mesh correspond to that foot. Specify one bone/socket for the heel of the foot, and one for the ball.

Since most character skeletons will have the foot bone located at the ankle rather than the heel, you will probably need to add a socket to that bone to tell the foot component where the heel is. There are instructions on how to add a socket here:

https://docs.unrealengine.com/4.26/en-US/WorkingWithContent/Types/SkeletalMeshes/Sockets/ The important thing is to make sure the socket is at ground level.

Note: It is possible to utilise this system with only a single foot socket, but the output is far more realistic if we are accounting for both the heel and ball of the foot

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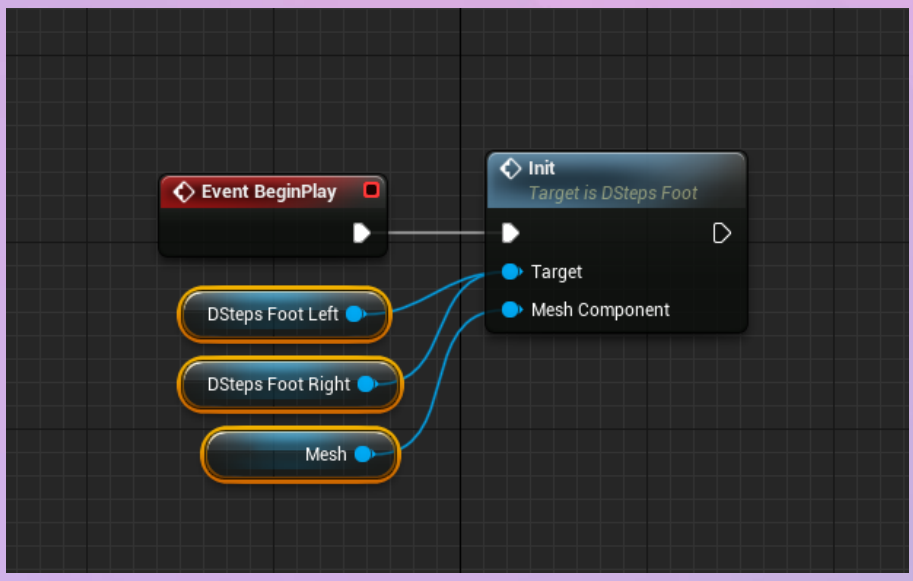
Last of all, you need to tell the foot components which skeletal mesh component to look at. This should be done in the BeginPlay Event of the character.



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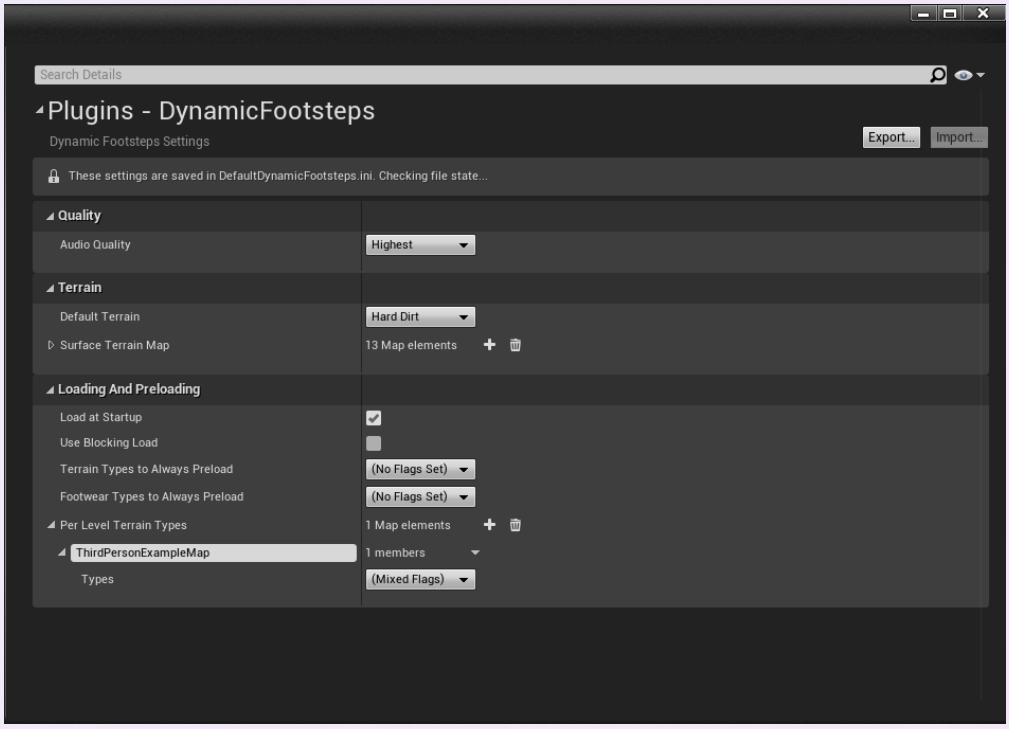
Plugin Settings

The Plugin Settings can be found under:

Edit/ProjectSettings/Plugins/DynamicFootsteps



Quality

Audio Quality has two setting options

Highest: 96KHz, 32B, 20 sound-file assets per Sound Cue

Lowest: 48KHz, 24B, 10 sound-file assets per Sound Cue

Terrain

Default Terrain

This assigns the selected terrain sounds to any surface type that is not otherwise tagged.

Surface Terrain Map

The Surface Terrain Map is where you define which sound sets are assigned to the various surface tags within your project. You can add as many Surface types as your project includes and select the desired sound set from the drop-down menu

The Surface Terrain Map is linked to the Physical Surface properties in the Project Settings
Edit/ProjectSettings/Engine/PhysicalSurface
The surfaces defined under this setting are what will link under the Surface Terrain Map

Per Terrain Pivot Sound Durations

One of the key aspects of this plugin is tracking foot rotation while in contact with a ground surface. This triggers a pivot sound. These settings allow you to adjust the minimum length of the pivot sound per surface type. These have been carefully tuned during development and we do not recommend adjusting them unless you take note of the values before you start.

Loading and Preloading

Note: These settings are still in development and may be updated in the future

These options control the various Load Optimisation settings. The plugin is linked to the foot of a model, so all loading of assets is linked to the loading of the linked model.

Load at Startup This results in the sounds loading at the time the linked model is loaded

Use Blocking Load This forces a pause in play while assets load (Not recommended)

Terrain Types to Always Preload Select if any specific terrain types are preloaded

Footwear Types to Always Preload Select if any specific footwear types are preloaded

Per Level Terrain Types

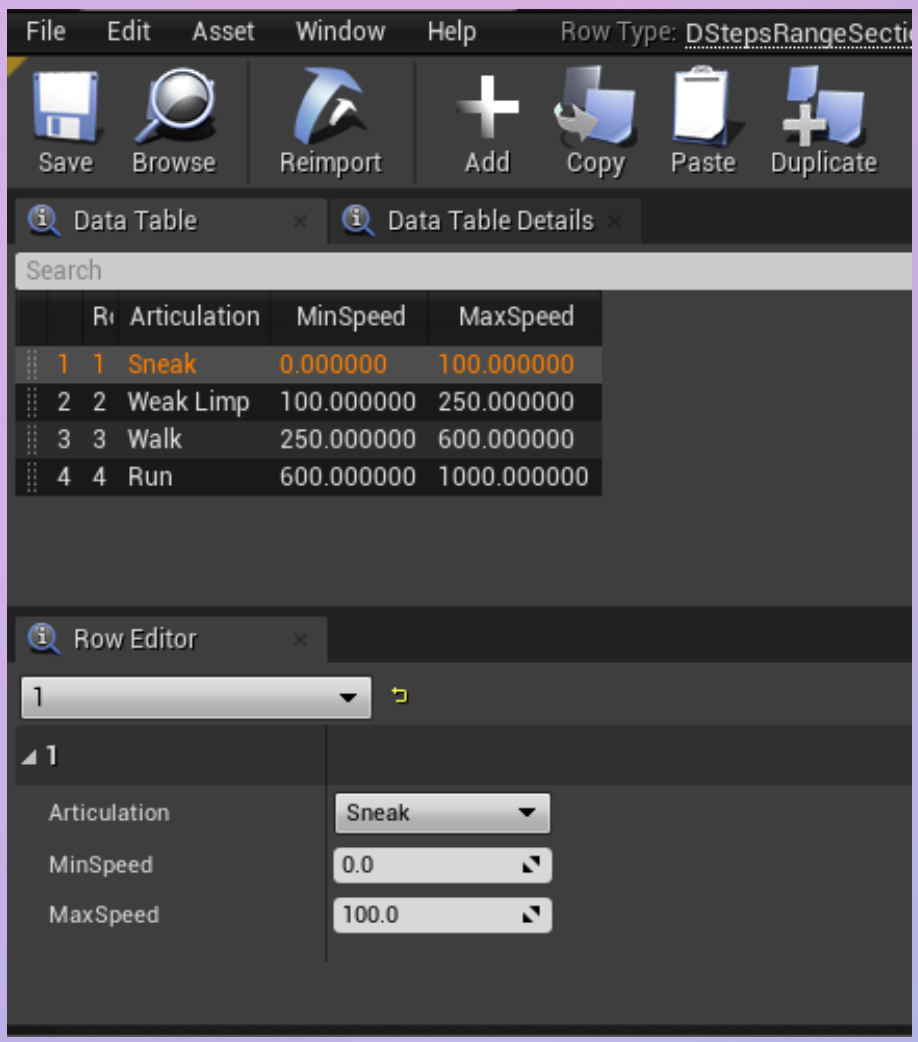
You can select each of your project's levels and for each level tag any and all terrain types to be used. This ensures those terrain sets are preloaded for each relevant level if Preload has been selected.

Blueprint Tweaking

While this plugin is designed to work straight “out of the box”, the Blueprint system lets you tweak this plugin to support specific project needs.

Speed Range Table

DynamicFootstepsContent/BluePrints/SpeedRangeTable



SpeedRange Table

The Speed range Table is where the articulation sets are defined for the range of impact speeds. There are 4 levels of impact intensity. This is sufficient for common usage. The ranges can be adjusted to cause the included articulation sets to trigger at different impact speeds and additional articulations can be added into the RangeTable.

By default, the plugin uses Sneak, Weak Limp, Walk, and Run in that order from lowest to greatest intensity. Strong Limp and March could function as additional steps within this range. Strong Limp is generally heavier in intensity than Walk and March is heavier again. Stagger is a series of unpredictable impact types suitable for a drunk person or Zombie.

Assets

There are currently over 5000 sound files included in this plugin pack.

Asset Groups: This plugin contains the following asset groups:

Articulation Sets		Terrain Sets
Walk	(Core)	Autumn Leaves
Run	(Core)	Bitumen
Stealth Walk	(Core)	Carpet
Pivot	(Core)	Deep Water
Limp Soft Impact	(Core)	Hard Dirt
Limp Hard Impact		Long Grass
March		Metal Grill
Stagger		Road Gravel
Jump Impact		Scrub
		Shallow Water
		Short Grass
		Snow
		Wood Bridge
		Wood Floor

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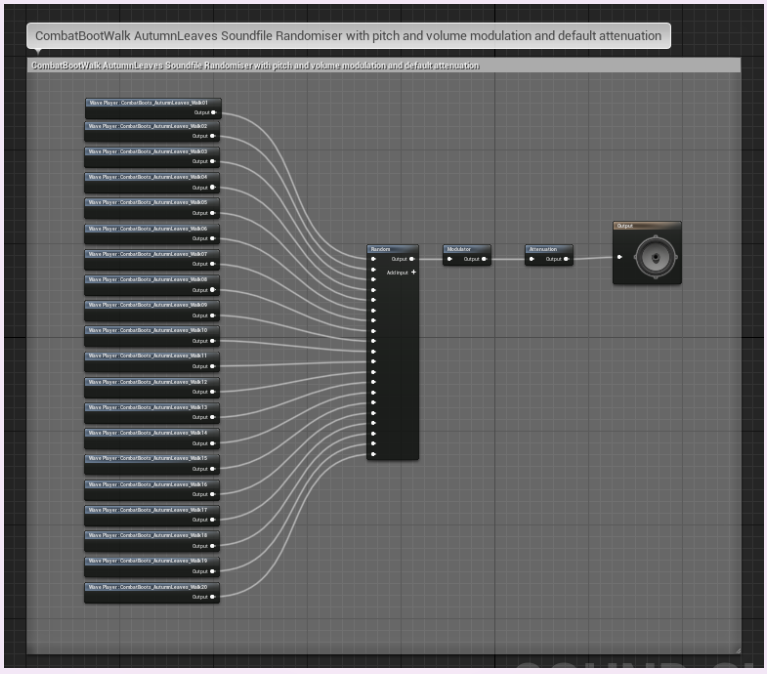
Every articulation for every surface type contains 10-20 sound file variations to maximise realistic playback. The default asset pack has been recorded at 96KH, 32Bit. The plugin also includes a 48KHz, 24bit option with only 5-10 sound file variations for projects that need to be mindful of resource usage.



Sound-file randomisation in SoundCues

Line trace function

If your project has very specific or unusual physics driving the character animation you may want to adjust aspects of the Line Trace Function.

DynamicFootstepsContent/BluePrints/DStepsFoot
LineTrace Tab

This is the main functionality for detecting when the foot is in touch with a surface type and which specific surface type is relevant. It does a simple line trace for the objects.

Rendering

We will include more information on rendering output in a future update of the manual.

Unreal Does not automatically include audio output during video rendering, so you need to adjust some settings to include it. The full description of the process can be found at the following link.

https://answers.unrealengine.com/questions/858782/how-to-get-audio-rendered-alongside-video-using-se.html