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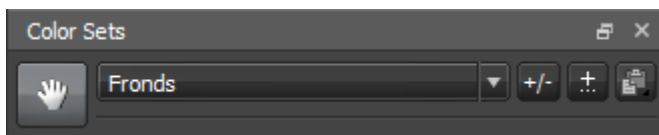
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Mesh Assets

Mesh assets are imported models from third party applications that can be used as parts of the tree.

Asset Common Properties



Each of the asset bars have a common group at the top. View this page to read about the common asset groups.

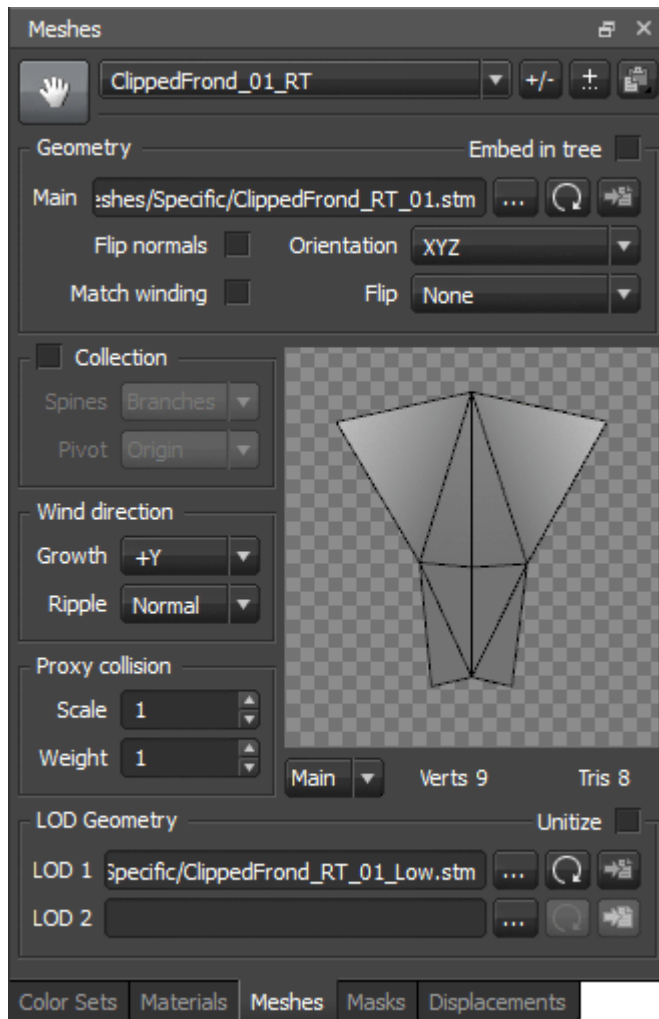
Meshes

Meshes are modular 3D models that can be used for leaves, fronds, zones, or force objects.

Acceptable Formats

The SpeedTree Modeler can load a variety of mesh formats, including FBX, OBJ, STM, SRT, DAE, and 3DS files.

Geometry Group



Main

The mesh asset that will be used most of the time, or all of the time in lieu of LOD meshes (see below). Either type a filename in the slot, or use the browse button to select an image file. Use the “reload” button to reload the file on disk.

Export Mesh

Mesh assets can be exported with the button to the right of “Main”. Exported meshes can be in 'OBJ' or 'STM' formats.

Embed in tree

This option makes the mesh part of the SpeedTree procedural model (SPM) file, and no longer reads the mesh data from disk. Unchecking this option will read the disk version, if it is found.

Flip normals

The vertex normals are flipped and the mesh faces will light in the reverse direction.

Match winding

If necessary, this corrects triangles whose face normal is different from the vertex normals. This may or may not be needed for a particular mesh, depending on your final application.

Orientation

Changes the initial orientation of the mesh. The most applicable settings are “Z-up Right-handed”

and “Y-up Right handed”. Set this value to the coordinate system used to create the model. For instance, a model made in Maya should be set to “Y-up Right Handed”. Arbitrary rotation orders can be applied as well.

Flip

Inverts one or more axes of the mesh asset. Use this option if your mesh comes in flipped incorrectly.

Collection Group

Enabled

When a mesh asset has “enabled” turned on in the 'Collection' group, it becomes a collection rather than a reference to a mesh file on disk.

Spines

When collections are enabled, they may be comprised of spine generators. If this is the case, the “Spines” option determines which portions of the spine generators are channeled into the collection. When set to “Branches”, branch and cap geometry only will be included. When set to “Fronds”, only frond geometry will contribute. When set to “Both”, all spine related geometry will contribute.

Pivot

“Pivot” determines the pivot point of the collection mesh. When set to “Origin”, the scene origin (0,0,0) is used as the collection's pivot. When set to “First”, the pivot of the first contributing node is used. This option is useful if the collection contributors are already growing off of the tree somewhere.

More info: Collections

Wind Direction Group

The properties in the 'Wind Direction' group affect the way that leaf meshes react to wind. These settings only apply to meshes that have been assigned to leaf generators.

Growth A vector determining the direction the mesh is “growing”. This is necessary for correct wind behavior on meshes such as Spanish Moss meshes. Depending on the way the mesh was originally modeled, this value may need to be changed to match the intended growth direction prior to being imported into the Modeler.

Ripple This value determines the ripple “style” used with this mesh asset. On the wind properties, 'leaf ripple style' can be set to use the direction of each vertices normal, or to “computed”, which will use this value instead. Options include “Normal”, X, Y, and Z. X,Y, and Z are constant directional vectors.

More info: Wind

Proxy Collision Group

The settings in the 'Proxy Collision' group only apply to mesh assets that have been assigned to a

proxy generator during proxy collision detection.

Scale

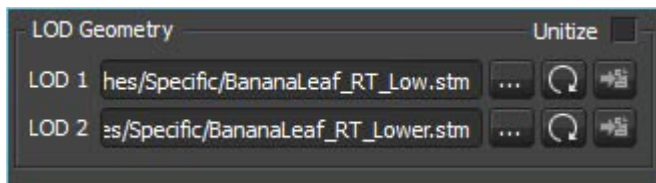
This scales the bounding box of each mesh asset for proxy collision purposes, or each collision object found in a 'SRT' mesh asset. When using 'SRT' mesh assets, the actual collision objects are referenced when calculating proxy collision. This scalar can be used to bring in or out the neighboring trees. Mesh collision scale can be further edited on a generator level (e.g. collision volumes can be scaled again per proxy generator).

Weight

Proxies are sorted by “Weight” before proxy collision occurs, favoring the higher weight when culling. Collision weight can be further edited on a generator level (e.g. weight can be scaled again per proxy generator).

More info: Proxy Collision

LOD Geometry Group



The two file selectors in the LOD Geometry group correspond to meshes used with “mesh LOD”. Mesh LOD is the process of replacing the “Main” mesh file with more simplified versions, for use with level of detail. Up to two LOD meshes can be specified.

Unitize

The “Unitize” option will take the longest extent of each LOD mesh (including “Main”) and resize all subsequent meshes to have the same length in that extent. Also known as “normalizing” the meshes, this feature allows for reasonable LOD mesh results with disparately sized source geometry.

LOD 1

The next LOD mesh used after “Main” (“Main” can be thought of as “LOD 0”). LOD 1 will either switch in at a defined distance, or by altering the mesh index LOD property. Use the buttons on the right to browse for, reload, or export the assigned mesh. Export formats include OBJ and STM.

LOD 2

This is the last LOD mesh, for viewing at a far distance. As such, the model can be significantly lower in detail from the “Main” mesh. Otherwise, LOD 2 works identically to LOD 1.

More info: Mesh LOD

Mesh Preview

The preview window displays the currently selected mesh. Right click in the preview area to toggle lighting, backface culling, and scribed (outlined) rendering. No materials are displayed on the mesh - materials are assigned to meshes on the objects that use them (e.g., leaf generators). This

approach allows the same mesh to be used with multiple materials throughout the model. The triangle and vertex count for the mesh are displayed below the window.

Check the box labelled “Show Alignment Help” to overlay a graphic that helps align meshes for their intended use. Generally speaking, SpeedTree objects expect the 'Z' axis to be the 'up' direction of the mesh. Frond geometry demands that the mesh grow along the positive 'Y' axis. Leaf geometry works best when oriented down the negative 'Y' axis. Use the 'Orientation' and 'Flip' properties in the 'Geometry' group to help align imported meshes with the alignment indicator.

Using SRT Files



When a “SRT file” (SpeedTree Run-Time file, generated by the SpeedTree Compiler) is loaded as a mesh asset, it's purpose is primarily for world building. As such, the actual geometry is only ever represented as a cross-hatch. However, when a matching billboard atlas is applied to a SRT proxy generator, the texture coordinates in the SRT files are used and the correct billboard image is mapped to the cross-hatch.

Advantages to Using SRT Files



When world-building for real-time use, using SRT files provides several advantages:

- Low poly cross-hatched geometry
- Use of actual billboard atlas
- SRT collision objects used during proxy collision (more accurate)
- Export of world-building data may be configured to contain the actual filenames of the run-time models for use in your game or real-time visualization, providing a seamless integration with the SDK.

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