

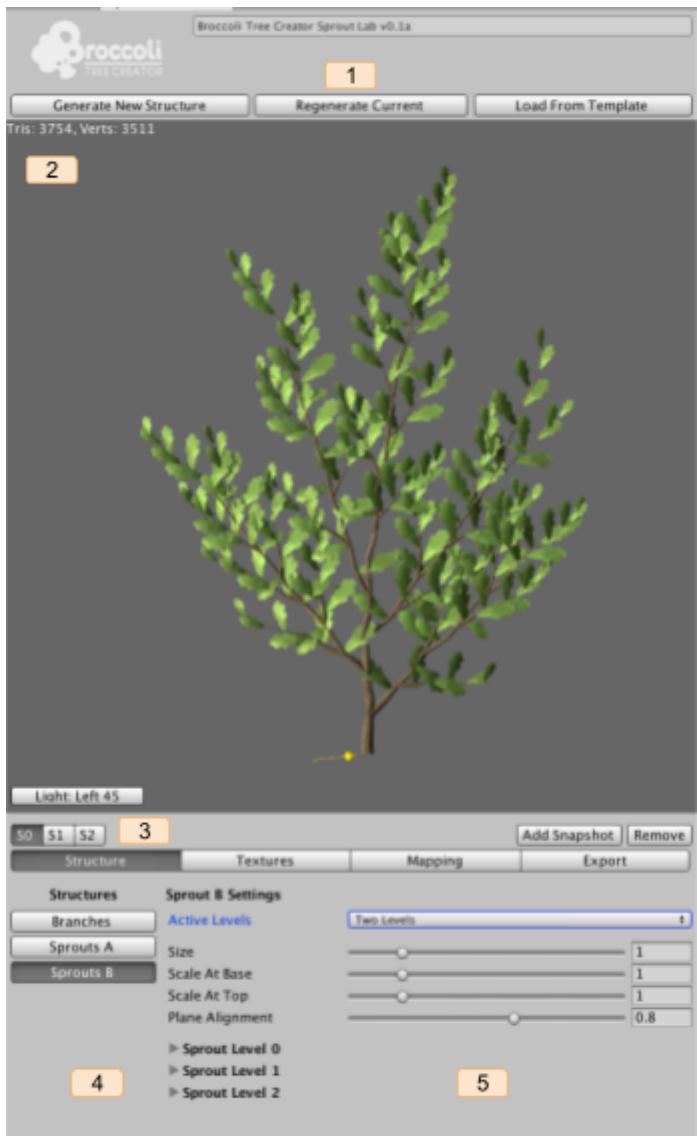
Broccoli Sprout Lab

Editor v1.0

Documentation

Sprout Lab Editor

UI Overview



The editor window contains the UI elements to set the configuration options and visualize the snapshot branches to be included in an atlas texture. To access the editor create a GameObject at the Scene Hierarchy:

Broccoli > Sprout Lab Editor

The main options sections are listed below:

1. Structure Generation Commands

These actions allow you to generate variations of branches to be integrated in the collection of branches. You can either generate a new structure iteration, regenerated one with the current settings or select one from the catalog.

2. Preview Canvas

This area displays the selected branch snapshot from the snapshots list. This canvas allows you to rotate around and zoom in/out the branch mesh. The default preview mode is called *Composite*, which closely resembles how the branch should look if the generated textures are used in a SpeedTree8 shader material. Other preview modes are *Normals*, *Extras* and *Subsurface*, these will be described further in this document. This area also displays textures when the Texture Section is selected.

3. Snapshot Commands

This section displays a list of branch snapshots. Each snapshot is a unique branch

variation, containing a unique set of structure options to be generated and a shared set of textures for the whole collection of snapshots.

4. Section Menu

There are four sections containing options to customize an individual snapshot or a collection of snapshots. Depending on the sections selected, this menu contains a navigation on structural aspects to modify on the branch (branches, sprouts A, sprouts B) or mapping previews (albedo, normals, extras, subsurface).

5. Section Options

Depending on the section and the section menu option selected, this area displays the options available to edit on the snapshot or snapshots collection.

These GUI areas and sections will be further described in this document.

Structure Section

This section contains options to modify the structure of the selected snapshot. The Structure Section menu displays three options, each for a structural aspect of the branch snapshot:

Branches

Contains the settings to control the number of branches, their distribution, direction, girth, length, and straightness. The options available to this structural aspects are the following:

Active Levels

Defines the number of hierarchy levels of branches used in the snapshot. There are up to 4 hierarchy levels to select, each level has its own collection of settings to adjust, in order to give each branch the look you want. Selecting the *Main Branch* option gives you a single branch, whereas selecting *Three Levels* gives you a branch with 3 hierarchy levels from the main single branch.



Girth at Base / Top

Sets the girth of the branches from the origin (Base) of the snapshot to the tip of the last branch in the hierarchy (Top).

Noise at Base / Top

How irregular the branch would be from the base to the top of the branches. Lower values give you straight branches pointing out to their direction. The higher the value, the more irregular the branch will look like.

Noise Scale at Base / Top

The scale of the noise controls the resolution of the irregular or ondulatory noise added to the branches. Lower values produce branches with more irregularities in a smaller length on the branch; higher values introduce the irregularities more spread across the length of the branch.

Frequency

The number of branches to spawn from the parent level. This option is available from the level 1 and up in the hierarchy.



Level 2 with frequency = 1-3



Level 2 with frequency = 5-7



Level 2 with frequency = 9-11

Length at Base / Top

Length of a branch from the base of the parent to the top of it.

Parallel Align at Base / Top

Direction of each branch from the base of the parent to the top of it. Parallel alignment adheres to the direction of the parent branch.

Gravity Align at Base / Top

Direction of each branch from the base of the parent to the top of it. Gravity alignment adheres to the direction against the gravity (upwards) instead of the direction of the parent branch.

Sprout A / B

Contains the settings to control the number of sprouts (leaves) on each branch level, their distribution, direction and size. The Sprout Lab Editor allows you to have two sets of sprouts (Sprout A and Sprout B) with separate configurations each. In order to get Sprout A or Sprout B active on the snapshot, each configuration needs to have at least one leaf albedo texture assign and be enabled at the desired hierarchy level to appear in.



Snapshot with Sprout A.



Snapshot with Sprout A and Sprout B.

The options available to this structural aspects are the following:

Active Levels

This option is the same as the *Active Level* option in the *Branch Section Menu*. It controls the number of branch levels to be available for the whole snapshot.

Size

Set the dimensions of each sprout mesh to be used later by the Scale setting, resulting in the mesh size depending on the position of a sprout on its parent branch.

Scale at Base / Top

Scaling is applied to the base size of a sprout mesh. The distribution of this scaling is taking from the base of the parent branch to its top.



Snapshot with uniform scaling.



Snapshot with scale = 2 at bottom.

Plane Alignment

The Sprout Lab Editor main function is to provide you with a set of flat textures to be used on your tree materials. This means that each branch snapshot mesh is going to be projected on a 2D texture. This value controls how much each sprout mesh is aligned in parallel with this 2D plane. Lower values mean each sprout mesh is going to most likely point in a different direction and not at the projection

plane normal. This is important if you want to get normal maps with more variation per leaf in a snapshot.



Sprout Level Enabled

The sprouts coming from a particular hierarchy level of branches could be enabled or disabled on each level. For example, if you want the main and first level of the branches hierarchy to have no leaves, then this options would be disabled for level 0 and level 1 in the hierarchy.

Frequency

The number of sprout meshes to assign to each branch in the given hierarchy level.



Parallel Align at Base / Top

Set the direction each leaf mesh should point towards relative to the direction of its parent branch. The higher the value the leaf will point more to the branch direction, a value of 0 gets the leaf to point perpendicular to its parent branch direction. Take in account that the final leaf direction is a combination of the parallel and gravity align.

Gravity Align at Base / Top

Similar to the Parallel Align this value is used to calculate the direction of each leaf mesh relative to the against-gravity vector (upwards). Take in account that the final leaf direction is a combination of the parallel and gravity align.



Gravity align = 0



Gravity align = 1

Branch Range

Controls the distribution of the leaves on a branch, limiting the range these are assigned on the length of the parent branch.



Branch Range = 0-1



Branch Range = 0.5-1

Textures Section

In this section you set the textures to be used by the branches and the sprouts. When selecting a texture for sprouts the preview canvas on this section changes to display the texture, showing controls to set the areas to be used for the leaves.

Branches

All the branches are mapped using a unique albedo texture and optionally a normal texture. The following options appear when selecting *Branches* on the *Selection Menu* on the left of the GUI.

Main Texture

This field is used to set the albedo texture to use on all the branches. This field is required.

Normal Texture

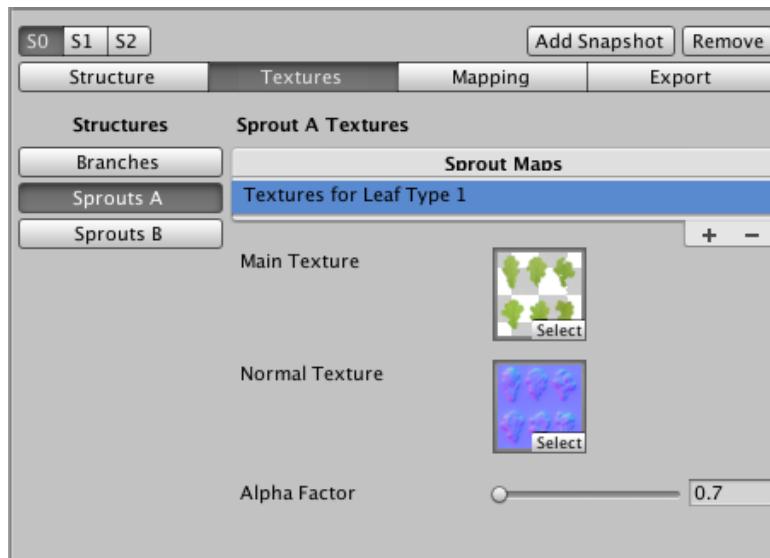
This field is used to set the normal texture to use on all the branches. This field is optional.

Y Displacement

This value is used to spread the UV mapping along the length of the branch meshes.

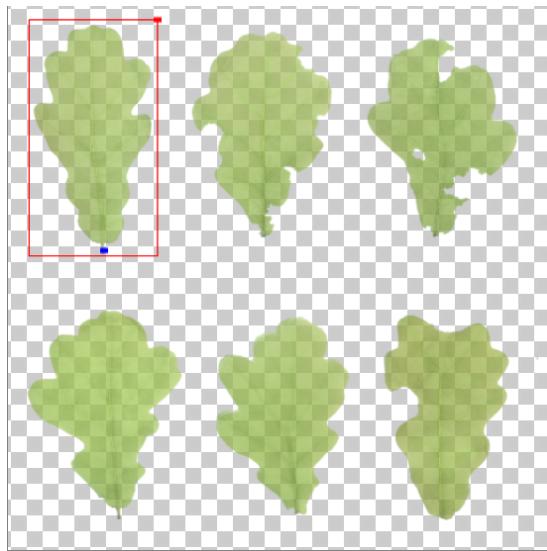
Sprouts A / B

Sprouts allow for multiple textures and areas within these textures to be mapped as individual leaves. First you have to select *Sprouts A* or *Sprouts B* on the *Selection Menu* on the left of the GUI, then add a new entry to the Sprout Maps list or select one of the existing entries for editing. The option to delete an existing entry is also available.



Main Texture

This field is used to set a texture and the area to be used as a leaf. The preview area displays the texture set and shows controls to define the area containing the texture region to work with. The blue point inside this area represents the pivot point or origin for the leaf.



Normal Texture

This field sets the normal texture for a *Sprout Map* entry. The normal map texture should have the same image distribution as the Main Texture, with an OpenGL normal tangent space (emerald green points upwards). At this time Sprout Labs does not offer an option to convert the normal map from other tangent spaces.



Alpha Factor

Optionally set transparency for the map. This value is taken in account in the subsurface texture to set how much translucency a leaf will hold.

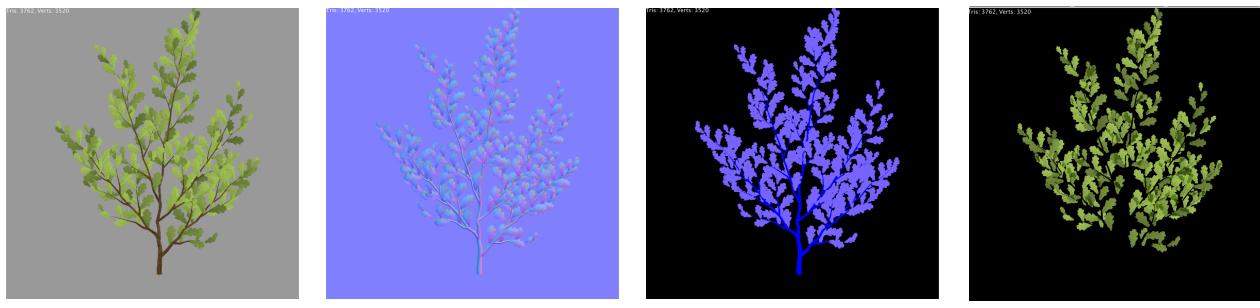
Mapping Section

This section displays controls to modify how the mapping for each sprout will look like when exporting them to single or atlas textures.

Mapping Options

The left menu of the Mapping Section displays 4 options to visualize the mapping modes for the selected snapshot:

- **Composite:** shows the branch snapshot the way it should look when using the four textures (albedo, normals, extras and subsurface) on a SpeedTree 8 shader material.
- **Albedo:** show the branch snapshot with the flat colors of the textures assigned to branches and leaves.
- **Normals:** shows the branch snapshot with the normal color values (in OpenGL tangent space) according to the orientation of branches and leaves.
- **Extras:** this special texture contains values for metallic, glossiness (smoothness) and ambient occlusion within a RGB color value. Red for metallic, green for glossiness and blue for AO.
- **Subsurface:** Subsurface scattering (SSS) is a mechanism of light transport in which light that penetrates the surface of a translucent object is scattered by interacting with the material and exits the surface at a different point. The light will generally penetrate the surface and be reflected a number of times at irregular angles inside the material before passing back out of the material at a different angle than it would have had if it had been reflected directly off the surface.



Albedo Map

Normal Map

Extras Map

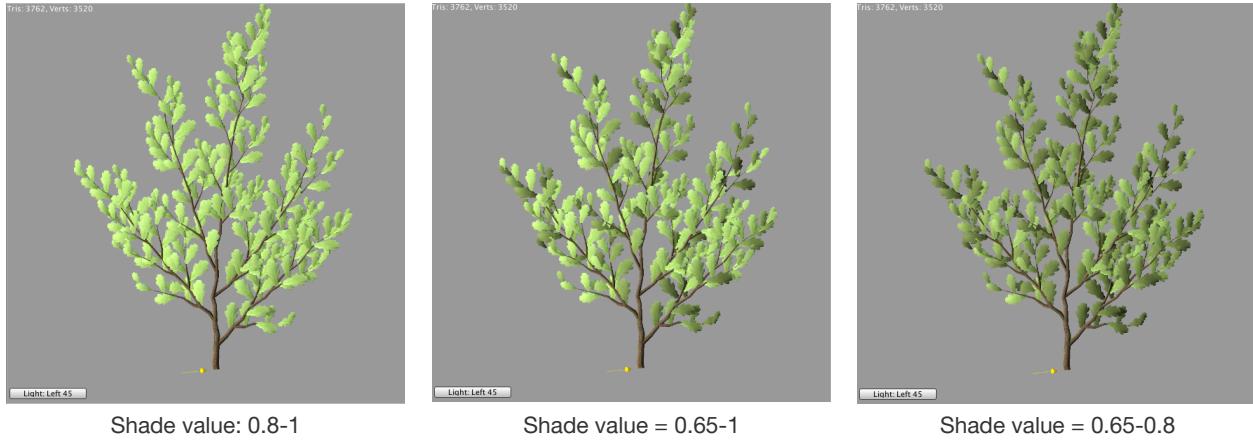
Subsurface Map

Mapping Setting

Contains controls to modify the parameters of shade, color, normal, metallic, glossiness and subsurface values reflected on the textures.

Sprout Shade

This value adds a random dark shade to every leaf mesh using a range set with a slider going from 0.65 to 1. Setting both the minimum and maximum value to 1 gives the leaves no shade variation, the maximum dark shade value is 0.65.

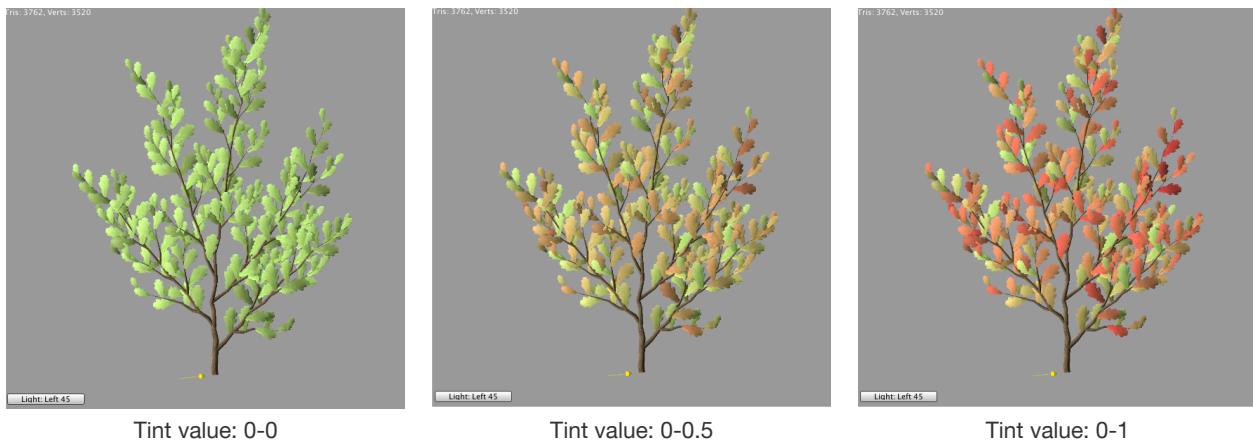


Tint Color

This is the value color for the tint to apply to leaf meshes through the snapshot branch.

Sprout Tint

Similar to *Sprout Shade*, this value adds a random color tint to every leaf mesh using a range set with a slider going from 0 (no tint) to 1 (full tint). You can get more uniform tinted leaf on the whole snapshot branch by using a min and max value in range close to each other.



Metallic

Metallic is a property of PBR (Physically Based Rendering) materials. This property corresponds to whether a surface is conductive or dielectric. Conductive materials have different reflective properties, and they tend to be reflective with no albedo color. In PBR materials, this property affects how much a surface reflects the surrounding environment. The value range is from 0.0 to 1.0.

Glossiness

Glossiness is a property of PBR (Physically Based Rendering) materials. This property could be found as roughness or smoothness as well, it defines how rough or smooth the surface is. Rough surfaces scatter the light in more directions than smooth (glossy) surfaces, which make reflections blurry rather than sharp. The value range is from 0.0 to 1.0. When glossiness equals 0.0, reflections will be blurry. When roughness equals 1.0, reflections will become sharp.

Subsurface

Subsurface scattering is a property of PBR materials used to calculate how much light a surface of a translucent object scatters by interacting with the material and exiting the surface at a different point. The color and intensity of it is set in the subsurface map.

Export Section

This section contains the option to import and export Sprout Lab Snapshot Collections from and to Scriptable Object files. It also contains settings to export the snapshot to individual textures or to an atlas texture.

Export Options

Commands for importing or exporting to files.

Export Textures

This command exports the texture for the selected snapshot or all the collection of snapshots to an atlas texture, depending on the selecting export settings. Depending on the size of the collection, creating the takes might take some considerable time, the editor will display a modal dialog with a loading bar to display the progress of the exporting operation.

Import from File

This command opens a file explorer window requesting to select a Scriptable Object file containing a Sprout Lab Snapshot Collection to load its data to the Sprout Lab Editor. This way you can save, share and retrieve your work in the editor.

Export to File

This command exports the working Sprout Lab Snapshot Collection data to a Scriptable Object file to be later retrieved to the editor to continue working with it.

Export Settings

This section contains options for the export commands described above.

Atlas Size

The size of the atlas containing all the snapshots in the collection or a single snapshot texture to be exported if that is the case on the *Export Mode* field.

Padding

The number of pixels used to separate each snapshot instance in the atlas. The values can go from 0 to 25 pixels.

Export Mode

Select from *Selected Snapshot* to export textures only for the branch snapshot you have selected or *Atlas* to export the whole snapshot collection to an atlas texture.

Take

This field is a number you can set on the textures file names to export.

Path

This option opens up a folder explorer window where you can select the destination of the files to export. Below this field there is a box showing the final path for all the textures according to the export settings.

Textures

This mask field is used to declare the type of textures to export (snapshot or atlas) according to the mapping modes: *albedo*, *normals*, *extras*, *subsurface*, *composite*.