

Real Ivy 1.0 Manual

Real Ivy is an **Editor Tool for Unity**. It's meant to **generate ivy** and other vegetation stuff **procedurally according to your levels**.

Once you put a seed in your map, **it will spread and grow in your map**, climbing walls, columns and whatever there is.

This growth is based on unity colliders, so if you want your ivy to climb your walls, you must put colliders into them.

What you need for use Real Ivy:

- A Unity Scene with colliders in it.

What Real Ivy returns:

- A mesh inside your project.
- A gameobject in your scene with a simple mesh renderer, pointing to the generated mesh into your project.

Known Issues:

- Undo Function doesn't work with this tool.
- Sometimes the branches will cross the colliders, getting inside floor or walls. Try changing step size, position of the seed, and randomize. Reopening Unity may help too.
- Sometimes the branches will become crazy and make weird knots. Try changing step size, position of the seed, and randomize. Reopening Unity may help too.

Warning

- Unity3D limits the vertex count of all meshes to 65.000. So if you make huge ivy with high resolution, you will reach this limit and the tool will crash.

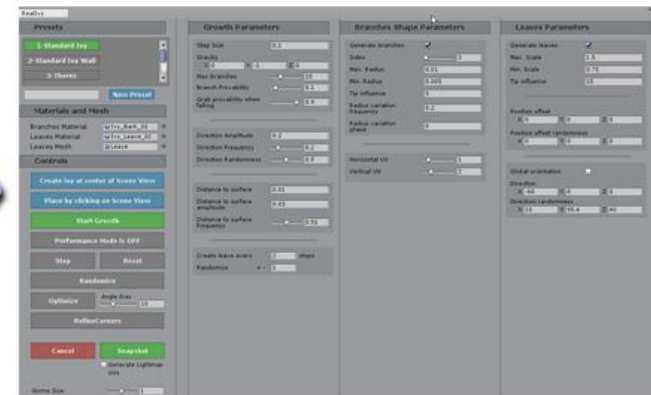
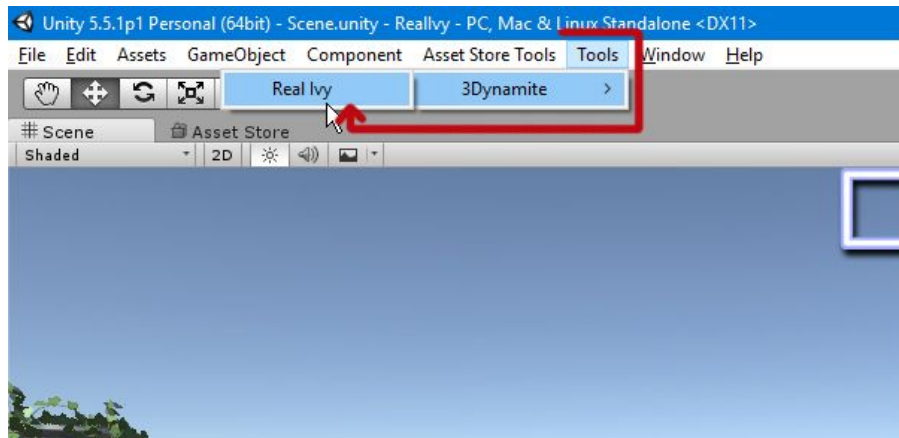
Let's talk about the features

- **Presets system** - Allows you to store configurations in order to improve your workflow and use different kinds of ivy when you need. A few presets are included in the package.
- **Normal mapping, reflections and PBR materials support** - The generated mesh is fully compatible with normal mapping, reflections and PBR techniques.
- **Lightmap UVs** - If you desire, you can generate Lightmap UVs for the generated mesh.
- **Optimizable Mesh** - You can optimize the mesh according to your needs, and balance between performance and visual quality.
- **Customizable Leaves Mesh** - You can use the mesh you desire for the leaves, making the ivy so good looking as you want.
- **Customizable Leaves Position, Orientation and Size**
- **Customizable Branch Shape** - Radius, radius variation, sides, and more.
- **Activate or deactivate leaves/branches independently.**
- **Place by click** - You can simply click in your scene wherever the ivy should start grow.
- **Customizable growth trajectory** - Adjust a few parameters for achieve different shapes and styles of vegetation.
- **Save mesh into project** - And use it as a simple mesh render.
- **Seed Based Randomness.**
- **Friendly UI.**

Let's talk about the workflow

This is my suggested workflow. You may find someone better for your purposes.

1. **Choose a preset** and modify materials and mesh and growth parameters as well if necessary.
2. **Place the seed** in your scene.
3. **Hit "Start growth"** button and let it grow.
4. **Hit "Stop growth"** when you have enough ivy.
5. **Adjust** "Branches Shape Parameters" and "Leaves Parameters". Those two categories of settings are real time configurable.
6. **Optimize your ivy** reducing the sides of the branches and hitting the "Optimize button". Repeat as many times as you need.
7. **Refine the ugly corners** if there are with the button "Refine Corners". It will do its best.
8. **Save the mesh** by pushing "Snapshot" button. It will save the mesh into the project and create a copy of your ivy in the scene, but as a simple mesh render.



You can open the tool under the tab “Tools” on Unity’s menus bar.

Presets



- 1 - These are **the presets**. Click on which you want to load it. The chosen one will be highlighted in green.
- 2 - If you click in the **Overwrite** button, you will overwrite the preset information with the current information in the Real Ivy Window. This is meant for improving a preset.
- 3 - This is the **Delete Preset** button. The default presets are not deletable
- 4 - This is a text field for the **name of a new preset**. Write there the name you want.
- 5 - Create **New Preset** button, when you click it, a new preset will be created.

The presets are alphabetically ordered, so I recommend to number them.

Leave Mesh and Materials

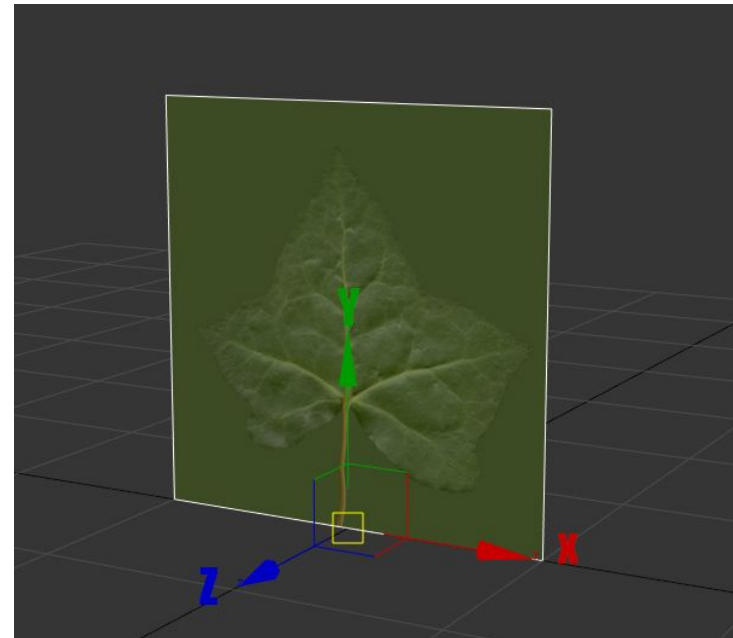


- 1 - Branches material** - Drag and drop a material here. It will be applied to the branches of your ivy.
- 2 - Leaves Material** - Drag and drop a material here. It will be applied to the leaves of your ivy.
- 3 - Leaves Mesh** - Drag and drop a mesh here. This will be used as model for all the leaves instantiated along the branches.

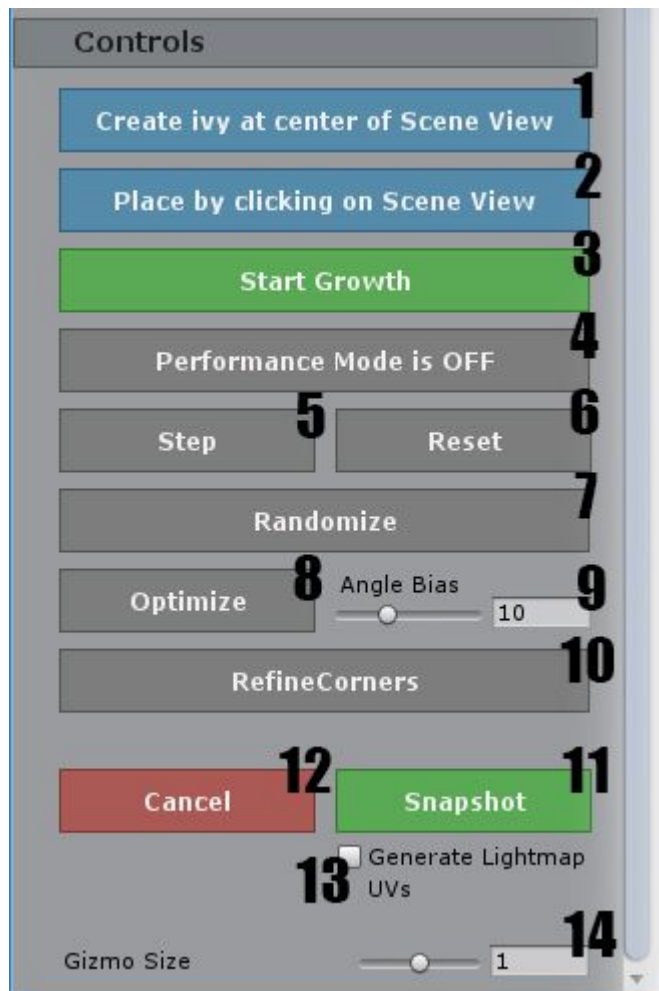
You can use the materials and the shaders that you want, with any feature such as wind effect, normal map, PBR illumination, lightmapping... Theoretically, the generated mesh will support any shader.

Indeed, you can drag and drop a mesh to be used as leaves in the mesh generation. The most common model you may like to use is a quad or a two sided quad (like the one included), with a leaf textured on it, but you can use any model you need, such as thorns, or geometrical leaves. Take care with the polycount!

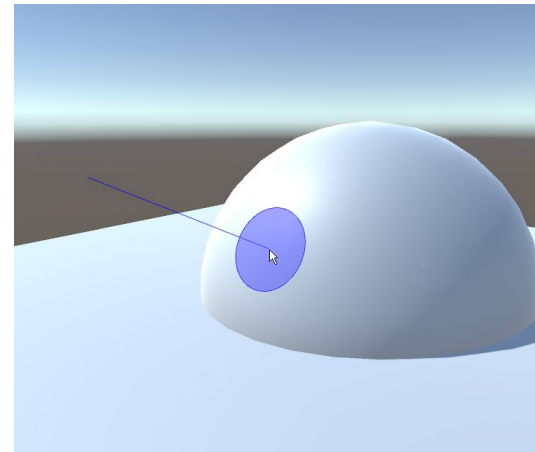
If you are going to use a custom model for your leaves, this is how the transform must be set:



Controls

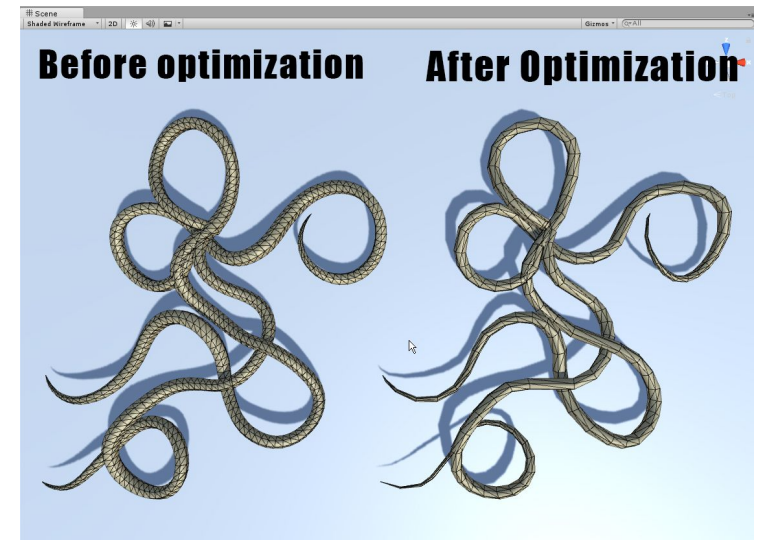
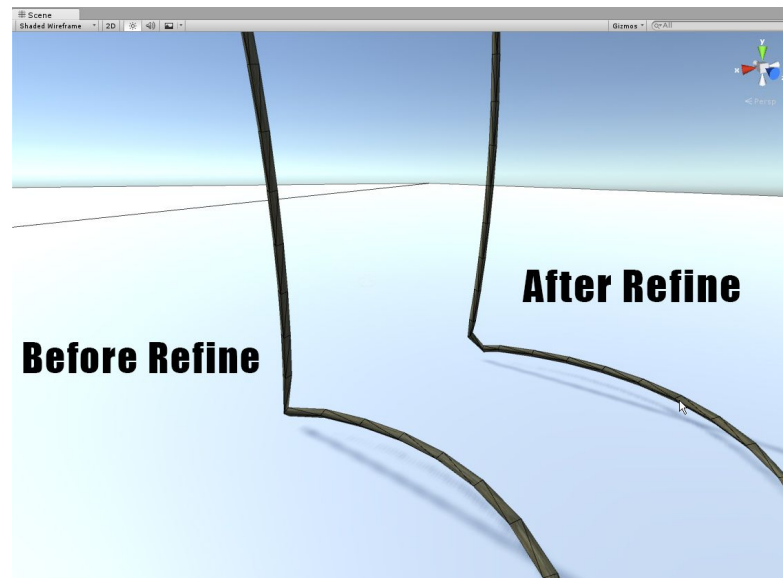


1. **Create ivy at center of Scene View** - Creates a Ivy Seed in the center of your scene view and let it selected.
2. **Place by clicking on the Scene View** - When click on this button, you are able to click on your scene view and the Ivy Seed will be created wherever you've clicked. This only works with colliders. You will see a blue gizmo showing where the Seed will be placed.



3. **Start Growth** - Let the ivy born and spread over your level. You can pause it clicking on this button again, cause it will change between "Start Growth" and "Stop Growth".

4. **Performance Mode** - This button enables or disables the performance mode. This mode disables the real time growth, so the mesh is generated faster. (Use it if the slowdown is too much on big ivys).
5. **Step** - Makes one single step in the ivy, like a frame by frame view.
6. **Reset** - Erases the current mesh, but doesn't destroy the gameobject or the settings.
7. **Randomize** - Creates a new random seed. If you don't like the way this ivy grows, this button will change this for the next growth. Commonly used after Reset.
8. **Optimize** - After the ivy is generated, this button will remove loops of the geometry for a better performance. Repeat as many times as necessary. THIS IS A DESTRUCTIVE OPERATION, so, take care. Anyway, if you reset and let it grow again without randomize, you should have exactly the same ivy.
9. **Angle Bias** - The lowest is this value, the lower quality loss for optimize operations.
10. **Refine Corners** - Sometimes a branch makes a sharp turn and create an ugly corner in the geometry. This button will try to improve these spots. THIS IS A DESTRUCTIVE OPERATION. Take care with it.

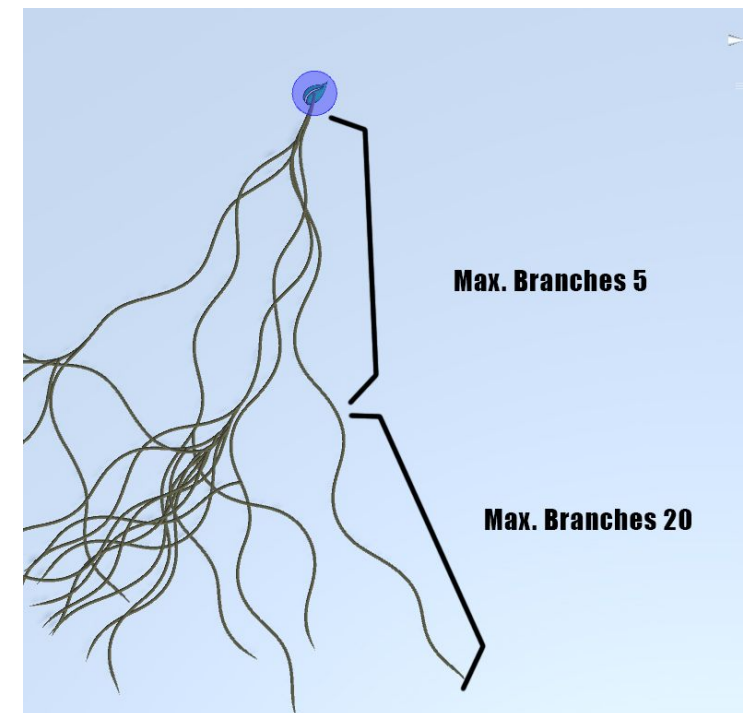
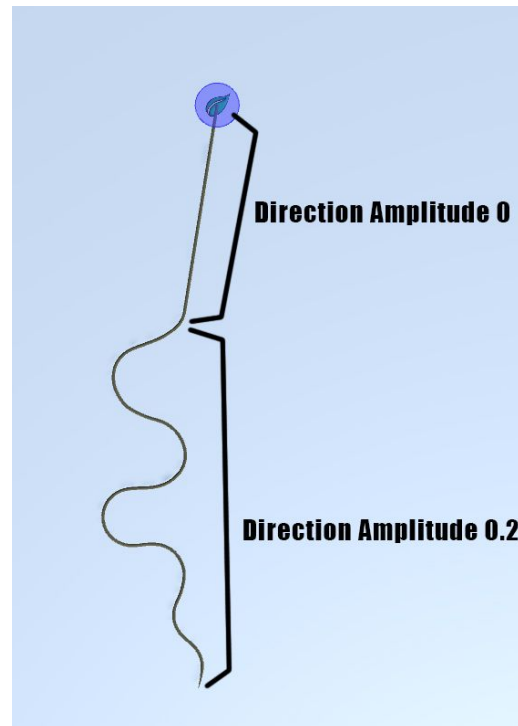
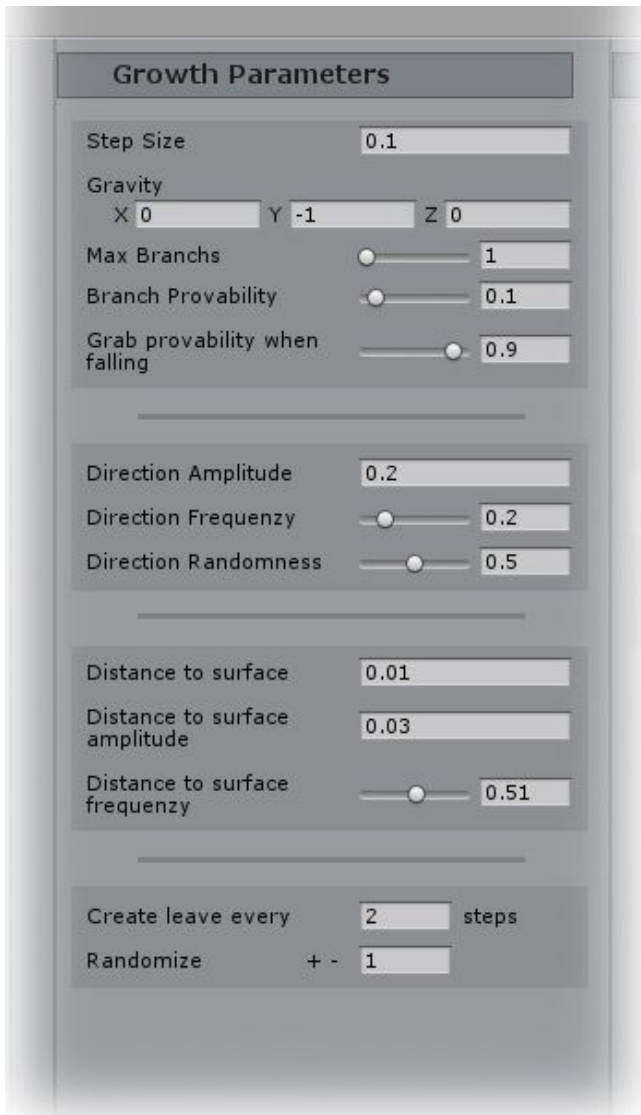


11. **Snapshot** - Saves the generated mesh into your project, asking you where do you want to save it, and creates a copy in your scene of the ivy using the saved mesh. This gameobject is the one you must use in your final scenes.
12. **Cancel** - Cancels the creation and deletes the Ivy Seed.
13. **Generate Lightmap UVs** - If checked, the mesh will be lightmapping suitable.
14. **Gizmo Size** - Changes the size of the blue gizmo of the Ivy Seed. You may want to change it for huge or tiny scenes.

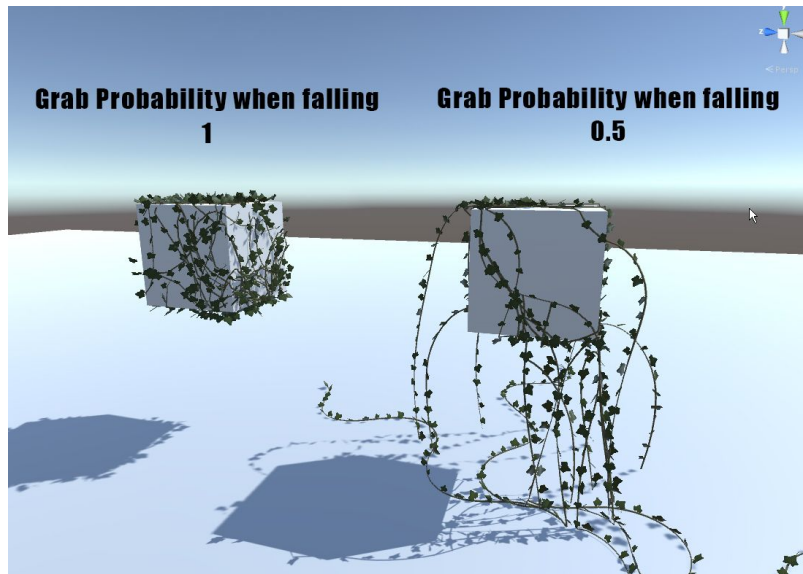
Growth parameters

These parameters determine the way the ivy grows. The paths it will take in the world. You can change them during the growth in order to achieve certain effects. For example, you can make the ivy starts being curly at certain point, or control the amount of branches during the growth.

I recommend to change these values with the growth paused.

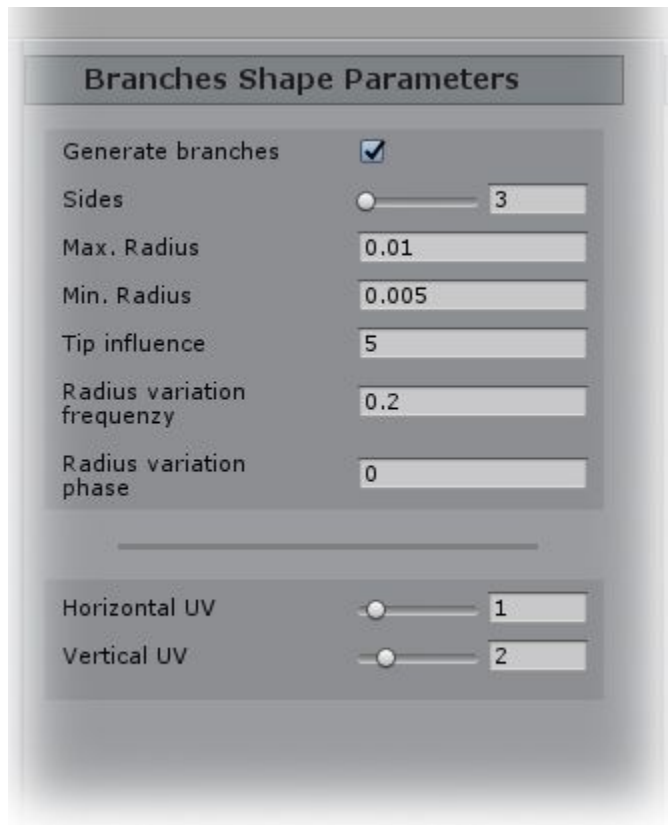


- **Step Size** - Is the distance between one point of the ivy and the next. Usually, use lower values for smaller ivys and higher values for bigger ivys.
- **Gravity** - Where should the ivy fall to when it losses the grab.
- **Max Branches** - The maximum amount of branches allowed. You can edit this value during the growth for control the branch spawning.
- **Branch Probability** - The chances of generate a new branch every step.
- **Grab Probability when falling** - This value controls the chances the ivy has to seek for a new surface when it is falling.



- **Direction Amplitude** - How much it will divert from the straight direction.
- **Direction Frequency** - How many curves will have the trajectory.
- **Direction Randomness** - Randomize the previous values.
- **Distance to surface** - The minimum distance the ivy will try to keep with the surface.
- **Distance to surface amplitude** - How much the distance to the surface will vary.
- **Distance to surface frequency** - How many curves will have the trajectory respect to the surface.
- **Create Leaves every N steps** - Leaves will spawn every this number of steps.
- **Randomize** - Randomize the above value for cool variations.

Branches Shape Parameters



These parameters are REAL TIME, so you can see dynamically the results on the branches while you change them.

They control the shape of the branches.

- **Generate branches** - Whether branches will be generated or not.
- **Sides** - The sides of the section of the branches. Think about the branches like twisted cylinders with this amount of sides. The higher this number is, the heavier the mesh will be. Keep this value down as much as you can.
- **Max. Radius** - The maximum radius the branch will reach.
- **Min. Radius** - The minimum radius the branch will reach.
- **Tip influence** - This value controls the "sharpness" of the tip of a branch. I recommend to adjust this value at the end of the ivy creation.

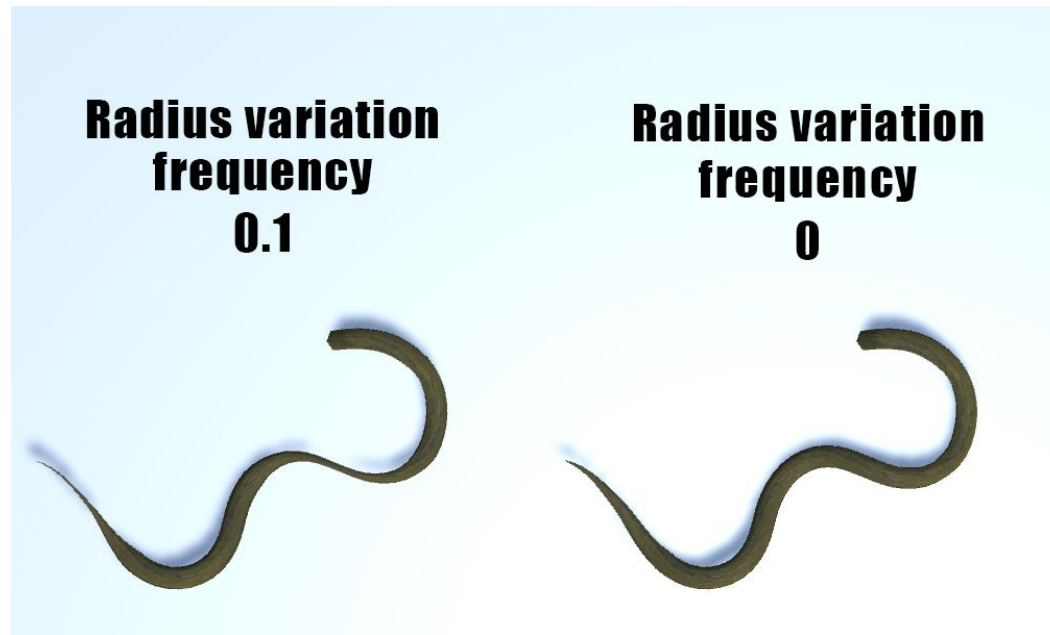


Tip influence 15



Tip influence 1

- **Radius variation frequency** - This controls how many times the branch will become thick and thin again, for creating organic lumps.



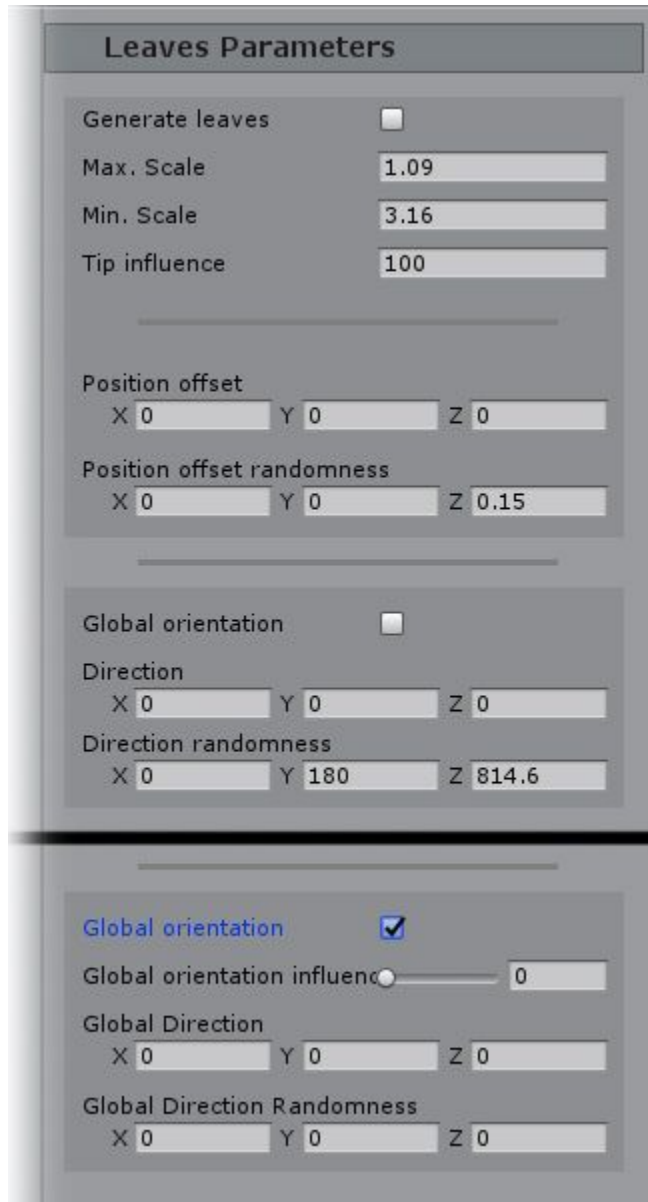
- **Radius variation phase** - This will change the location of the lumps across the branch.
- **Horizontal UV** - Controls the transversal UV coordinates of the branches for correct mapping.
- **Vertical UV** - Controls the longitudinal UV coordinates of the branches for correct mapping.

Leaves Parameters

These parameters are REAL TIME, so you can see dynamically the results on the leaves while you change them.

They control the scale, position and rotation of the leaves.

- **Generate branches** - Whether leaves will be generated or not.
- **Max. Scale** - The maximum scale of the generated leaves.
- **Min. Scale** - The minimum scale of the generated leaves.
- **Tip Influence** - How many leaves will be decreasing while reaching the tip of the branches.
- **Position offset** - The offset of the leaves relative to the center of the branch. You may need it for prevent the leaves are within the branch itself.
- **Position offset randomness** - Randomizes the previous parameter.
- **Global orientation** - If deactivated, each leaf will have independent orientation. Otherwise, you will be able to make all of them to point the same direction. Global orientation is useful for hanging leaves.



**Global Orientation
ON**

**Global Orientation
OFF**

- **Direction** - Where the leave shall point to, relative to the direction of the branch at that point.
- **Direction randomness** - Randomizes the previous parameter.
- **Global orientation influence** - How much the global influence affects to the leaves.
- **Global direction** - Where the leaves shall point to, relative to global space.
- **Global direction randomness** - Randomizes the previous parameter.