Mtree

Tree creation

About Mtree

Mtree is a tree creation tool that allows easy high quality tree creation inside the Unity editor.

Mtree consist of:

- o User friendly step-by-step tree creation.
- o Branches obstacle avoidance to make trees that adapt to the environment.
- o Automatic material creation.
- o Shader that supports wind vertex displacement, fast translucency, leaf color variation, and instancing.
- o Automatic levels of details (LOD) creation.
- o Automatic billboard creation.
- o Automatic ambient occlusion baked into the vertex colors.
- o Prefab creation.

Useful links

Website https://mtreecreation.com/

FAQ https://mtreecreation.com/faq/

Official Unity thread
https://forum.unity.com/threads/mtree-tree-creation.548995/

Email mx.contactmx@gmail.com

Index

Mtree Documentation v 2.5.3
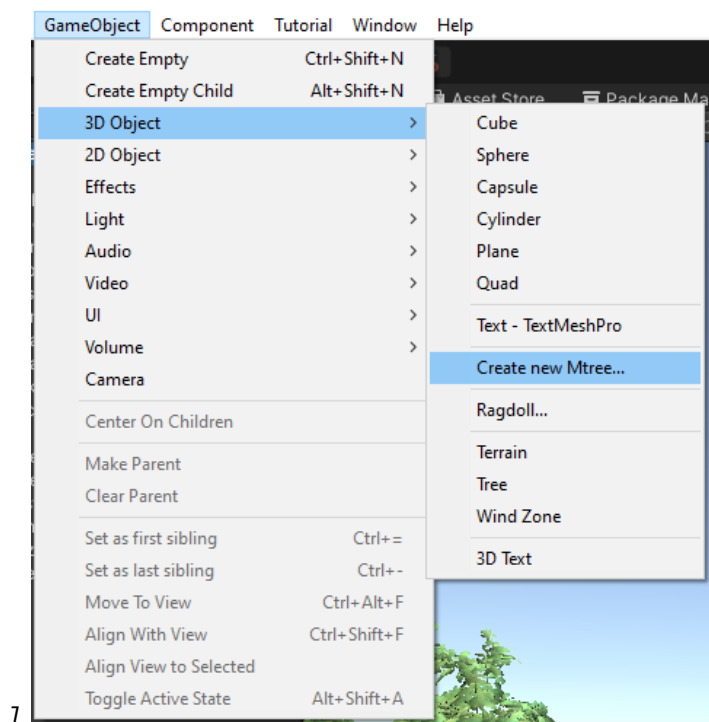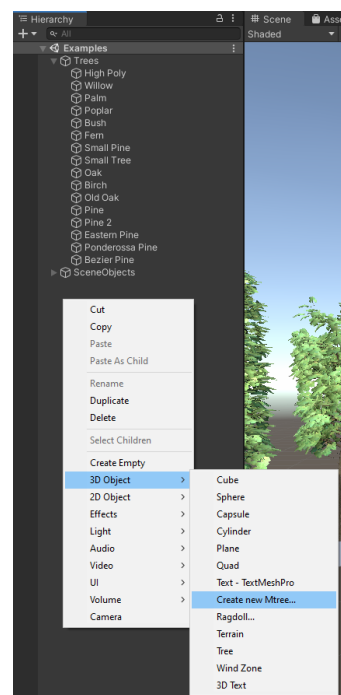
1. Getting started

Create a tree

There are three equivalent ways to create a new tree.

1. Go to *GameObject/3D Object* and select *Create new Mtree*.
2. You also can right-click in the Hierarchy and do the same.
3. You can also add an empty object, and add the component *MtreeComponent.*

1

2
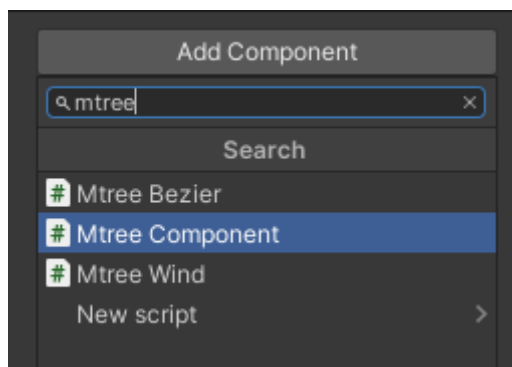
3

Mtree component

The Mtree component is what will guide the creation of the tree, and allows saving it as a prefab. It can be found in the inspector when a tree is selected.
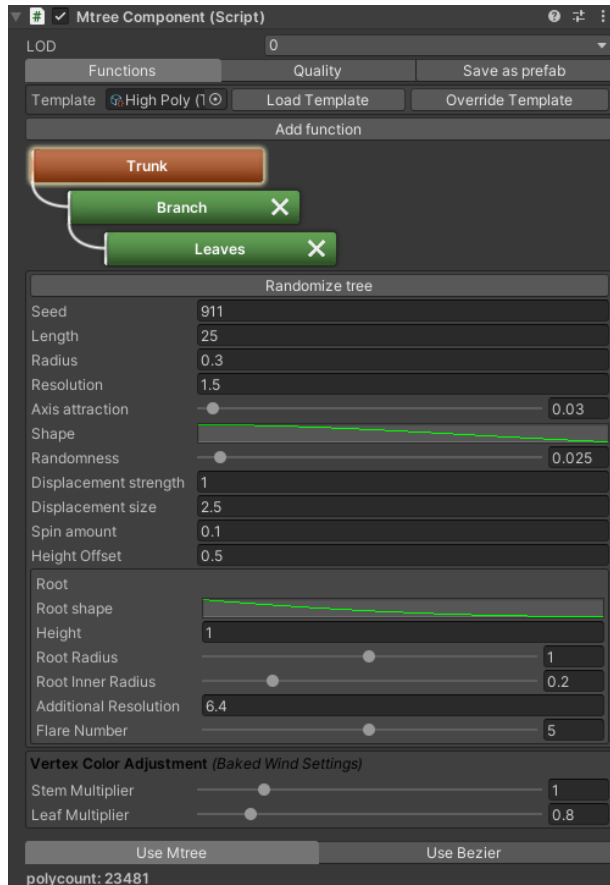
There are three tabs on the Mtree component:
- Functions – to create the tree level by level.
- Quality – to control the quality and polycount of the tree.
- Save as prefab – to export the tree as a prefab once it is finished.

Creating and using templates

When creating a tree, if you have a precise idea of the type of tree you want you can use an existing template. This will give your tree the shape that you want.

In the Mtree component, there are some options that enable you to save your tree as a template and to use an existing template. Mtree provides several templates : birch, pine, oak, etc… but you can always create your own templates.

Mtree Documentation v 2.5.3
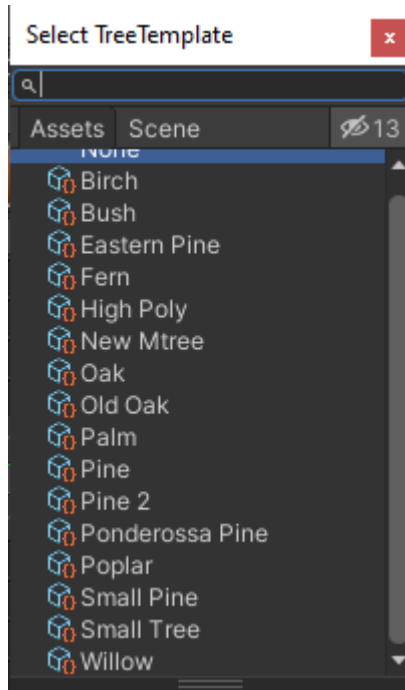
Functions tab

It is the most important tab, the one in which the tree is effectively created.

A tree follows an intuitive structure. First there is the trunk and the roots, then the branches, and finally the leaves. Each step is associated with a function, and each function has parameters.

To add a function, click on **Add function** and select the function you wish to add. The function will be added on top of the previously selected function.
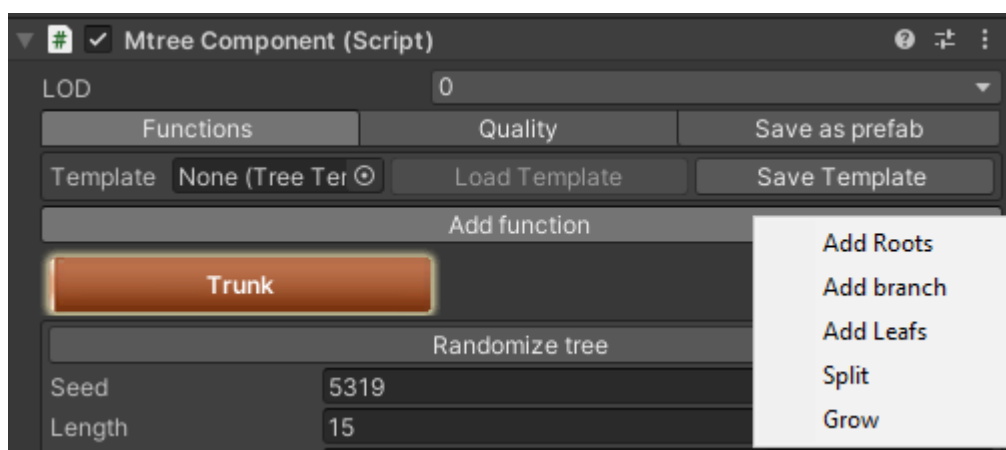
Note: the function Add Roots will only be available when you are selecting the trunk.

To select a function and change its parameters, click on it. It will be highlighted once selected.
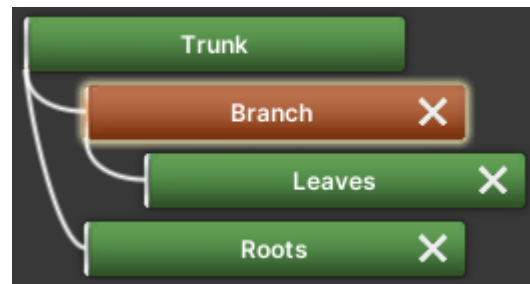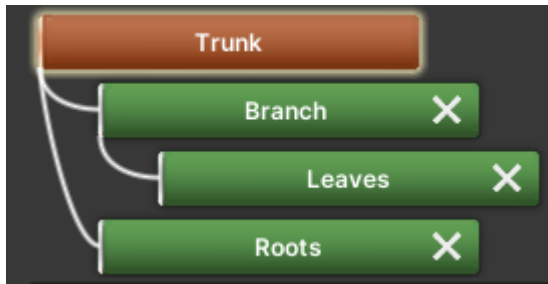
To remove a function, click on the X inside the function you wish to remove.

Roots Function

This function adds roots to the trunk of the tree. You must select the trunk to add roots to it. You cannot add roots to the branches of the leaves.

Branch Function

This function adds branches to the active level of the tree; if the trunk function is selected, the branches will be added to the trunk, and if a branch function is selected, the new branches will be added on the selected ones.

Leafs Function

This function adds leaves to the active level of the tree. If a tree has a leaf function, it will have two sub meshes, and two materials.

Split and Grow Functions

Those functions are used to have greater control over the tree. They are not used often.

The **Split** function adds tiny splits to the selected levels. Those splits are very short branches that can be grown.

The **Grow** function makes the extremities of the active level of the tree grow. It is mostly used after a Split function, but can be applied to any other function except a **Leafs** function.

Note : the **Branch** function is nothing more than a Split and Grow functions combined into one, with less parameters exposed.

The Functions parameters

Each function has a set of parameters which control how the function affects the tree. Playing with the parameters is probably the best way to discover their uses. Here are the most important parameters:

- **Seed** – Changing the seed will give another result of the function, like throwing dice two times will give two different numbers. To change the seed of all functions at once, you can click on **Randomize tree.**
- **Length** – controls the length of the branches/trunk generated.
- **Resolution** – Increasing the resolution will give a more complex looking tree, with a higher number of triangles. Be wary as the poly-count rises quickly.
- **Randomness** – A higher value will give the tree a more jagged appearance.

Quality tab
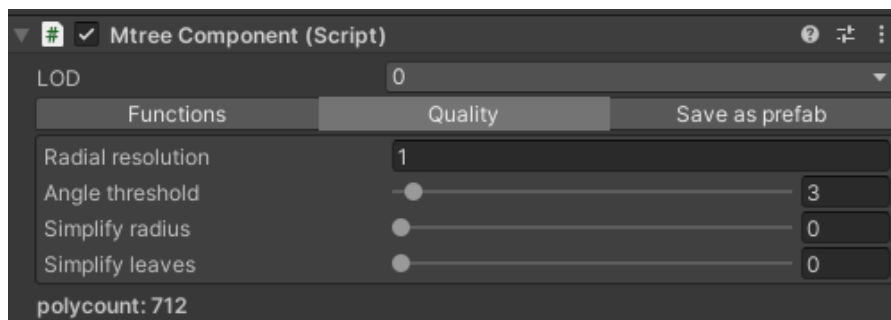
It is a seldom visited tab, it allows control over the quality of the tree. The settings of the quality tabs vary with the [level of detail](#) (LOD) of the tree. To visualize each LOD level, change the **LOD settings**.

- **Radial resolution** – Controls the amount of vertices that go around each branch. Lower is more performant.
- **Simplify angle** – Controls how much straight branches are simplified. Higher is more performant.
- **Simplify radius** – Threshold of the thinnest branch drawn. Higher is more performant.
- **Simplify leafs** – Controls the density of leaves after their creation. Higher is more performant.

In most uses, the default values of each LOD level are good enough.

Save as prefab tab
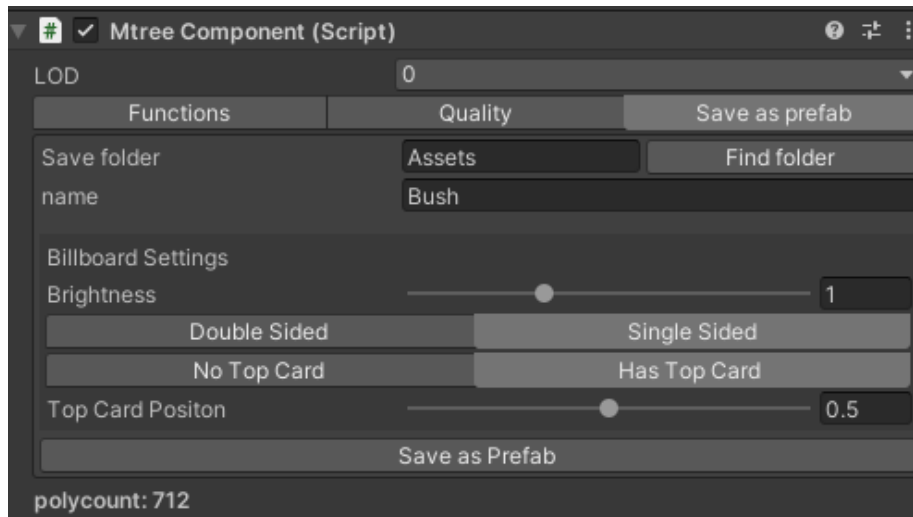
The trees are created with the Mtree component. When you are satisfied with the tree and consider it finished, **you must save it as a prefab using this tab**, otherwise the tree will not be optimized.

Saving the tree as prefab will generate all four LOD levels with ambient occlusion, as well as render a billboard. The meshes are saved in the specified folder, and a prefab with a LOD group is created.

You can visualize the result of the ambient occlusion pass by clicking on **Bake ambient occlusion**. Note that the ambient occlusion information will be lost if you change the tree afterwards.

You can Select the folder to which save the prefab by clicking on **Find folder**.

Save the tree as a prefab by clicking on **Save as Prefab** and wait until the process is over. You can find the prefab in the specified location. Once the tree is saved, only use the prefab, you can delete the tree with MtreeComponent attached.

You can Adjust the Vertex Color of the Tree by those two sliders, this will affect the Wind Strength on the Bark and the Leafs.

2. Exhaustive list of function parameters

Trunk

Parameter	Description
Seed	Random generator seed, changing the seed will give a new result for the tree function.
Length	The length of the generated trunk.
Radius	The radius of the trunk.
Resolution	The amount of points per unit of length.
Axis attraction	How much the tree is drawn to its original axis. Prevents the trunk from diverging too much.
Shape	The variation of the trunk radius with its length.
Randomness	How irregular the trunk looks.
Displacement strength	How much noise affects the geometry of the trunk.
Displacement size	How large is the noise affecting the geometry of the trunk.
Spin amount	How much the trunk is twisted.
Height offset	How much the trunk goes inside the ground. Helps when a tree is placed on uneven ground.
Flares	
Shape	The evolution of the radius of the trunk near the ground.
Start Height	The height to which the flares go.
Outer radius	The radius of the trunk on the ground.
Inner radius	The inner radius of the trunk.
Additional resolution	How much more resolution to add to the trunk near the ground.
Number	Number of flares near the ground.

Roots

Parameter	Description

Seed	Random generator seed, changing the seed will give a new result for the tree function.
Number	Roots count.
Length	Length of the roots.
Resolution	The amount of points per unit of length. **Warning:** polygon count is very sensible to this parameter.
Randomness	How irregular the roots are.
Radius	The start radius of the roots, relative to the radius of the trunk.
Shape	Evolution of roots radius along their length.
Split proba	The probability for a root to fork into multiple roots. **Warning:** polygon count is very sensible to this parameter.
Angle	The angle the roots will grow from the trunk.
Start height	Lowest position on the trunk at which the roots can start.
End height	Highest position on the trunk at which the roots can end.
Ground height	Adjust the height of the ground. The roots will try to follow the ground.
Attraction strength	How much the roots are attracted to the floor.

Branches

Parameter	*Description*
Seed	Random generator seed, changing the seed will give a new result for the tree function.
Number	Branches count.
Length	Length of the branches.
Resolution	The amount of points per unit of length. **Warning:** polygon count is very sensible to this parameter.
Randomness	How irregular the branches are.
Radius	The start radius of the branches, relative to the radius of what they grow on.
Shape	Evolution of branches radius along their length.
Split proba	The probability for a branch to fork into multiple branches. **Warning:** polygon count is very sensible to this parameter.
Angle	The angle of the branches from what they grow on.

Up attraction	How much the branches tend to grow toward the sky.
Gravity strength	How much gravity affects the branches.
Start	The minimum height from which the branches are created.
React to scene colliders	Check this box if you want the branches to react to scene colliders.

Leaves

Parameter	Description
Seed	Changing the seed will give another result of the function.
Mesh type	The geometry of the leaf.
	cross
	diamond cross
	diamond
	long
	plane
	procedural
	custom
Number	Leaves count.
Size	Leaves size.
Max branch radius	The maximum radius of the branches from which the leaves are created.
Leaf weight	How much the leaves are drawn to the ground.
Override normals	If true, the leafs normal will be determined by their position on the tree. If false the default leaf mesh normal is used.

Split

Parameter	Description
Seed	Random generator seed, changing the seed will give a new result for the tree function.
Number	Splits count.
Split angle	Angles of the new branches from their parent branches.

Split radius	The radius of the new branches relative to the radius of their parents.
Start	Where the splits start to appear on their parent branches.
Height spread	How evenly divided the splits are on their parent branches.

Grow

Parameter	*Description*
Seed	Random generator seed, changing the seed will give a new result for the tree function.
Length	The additional length to grow each extremity.
Resolution	The amount of points per unit of length. **Warning:** polygon count is very sensible to this parameter.
Split proba	The probability to fork into multiple branches. **Warning:** polygon count is very sensible to this parameter.
Split angle	When forking, the angle between the newly created branches.
Shape	The evolution of the radius with the length.
Split radius	When forking, the radius of the newly created branches.
Max splits at a time	The max number of splits that can occur in the same location.
Randomness	How irregular the branches look.
Up attraction	How much the branches tend to grow toward the sky.
Gravity strength	How much gravity affects the branches.

3. Shaders

Shader types

Legacy Shaders:

- ○   - Bark Shader
- ○   - Bark Shader Outline
- ○   - Leaf Shader   => forward only
- ○   - Leaf Shader Deferred   => deferred only

- ○   - Leaf Shader Outline

Billboard Shader
- ○   HDRP Shaders:
- ○   - Bark HDRP Shader
- ○   - Leaf HDRP Shader
- ○   - Billboard HDRP Shader
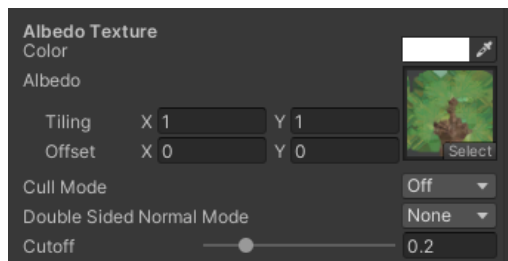
LWRP Shaders:
- ○   - Bark HDRP Shader
- ○   - Leaf HDRP Shader
- ○   - Billboard HDRP Shader

URP Shaders:
- ○   - Bark HDRP Shader
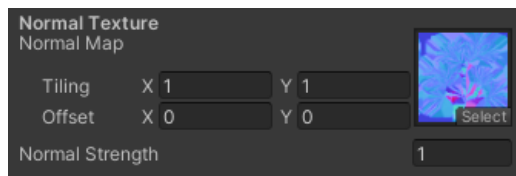- ○   - Leaf HDRP Shader
- ○   - Billboard HDRP Shader

Shader properties

Albedo

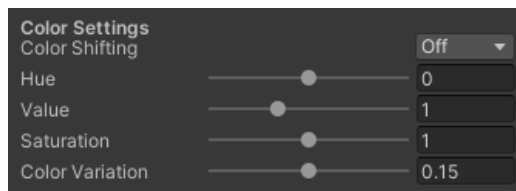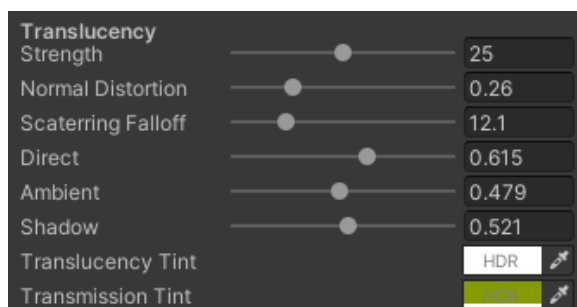| Property	Explanation
Color	Color tint
Albedo	Main Texture of the Material
Cull Mode	Which Face is being rendered
Double Sided Normal Mode	How the backface Normals are displayed
Cutoff	Threshold of Alpha Cutout

Normal

Property	Explanation
Normal	Normal Map of the Material
Normal Strength	Intensity of the Normal Map

Color Settings

Property	Explanation
Color Shifting	Color Shifting On / Off toggle
Hue	Color
Value	Brightness of the Color
Saturation	Saturation of the Color

Translucency Legacy & Outline Leaf

Used by: Leafs Legacy, Leafs Outline shaders.

Property	Explanation
Strength	Translucency effect strength, you can think of it as a multiplier slider.

Normal Distortion	Defines the amount of normal distortion on the translucency effect.
Scattering Falloff	Scattering falloff amount for the translucency effect.
Direct	Direct light influence on the translucency effect.
Ambient	GI/ambient light influence on the translucency effect.
Shadow	Self-shadowing influence on the translucency effect, reduces the translucency effect in shadowed areas.
Translucency Tint	Translucency Color
Transmission Tint	Transmission Color

Translucency Custom Leaf Shader
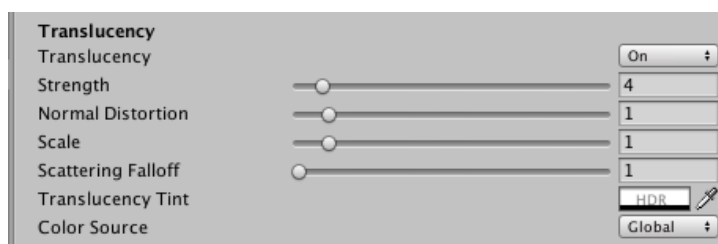
Used by following shaders: Leafs LWRP, Leafs URP, Leafs Legacy Deferred

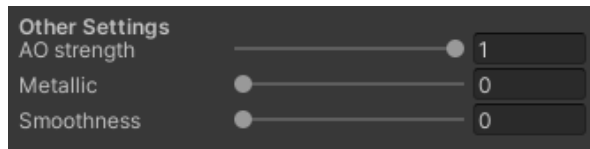| *Property*	*Explanation*
Translucency	On / Off toggle for Translucent effect.
Strength	Translucency effect strength, you can think of it as a multiplier slider.
Normal Distortion	Defines the amount of normal distortion on the translucency effect.
Scale	Size of the Effect
Scattering Falloff	Scattering falloff amount for the translucency effect.
Translucency Tint	Translucency Color - only works if custom color is selected as source.
Color Source	Select if global light color or custom color is used.

Translucency HDRP Leaf Shader

Used by following shaders: HDRP.

4.x	Diffusion Profile List

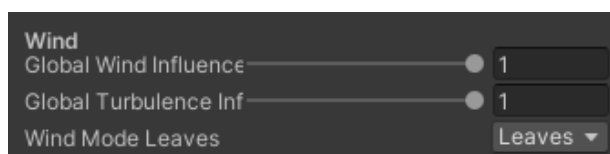| 5.x / 6.x	Diffusion Profile Provided by Mtree, set directly in Shaders.
7.x	DIffusion Profile, which can be directly switched out in the Shaders.

Thickness Map is directly baked into uv4.x Channel.

Other settings

Property	Explanation
AO Strength	Ambient Occlusion Strength.
Metallic	Main Texture of the Material.
Smoothness	

Wind

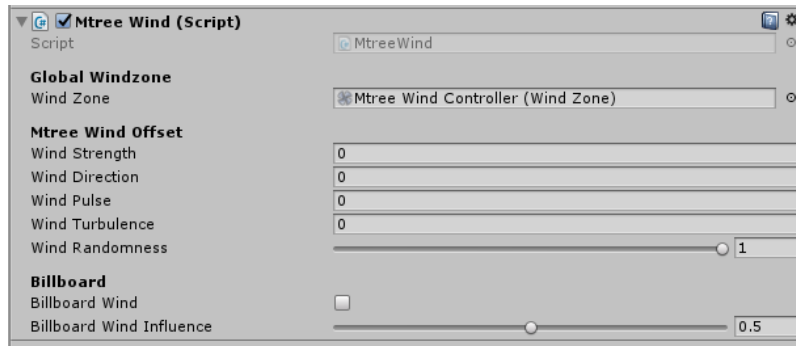| Property	Explanation
Global Wind Influence	Global Wind influence (needs to be the same on Bark / Leaf Material).
Global Turbulence Influence	Global Leaf tumbling influence.

Global Wind Controller

The Mtree Wind script works with or without a Wind Zone. If a Wind Zone is selected the Wind Zones Parameters are used for controlling the Wind and The Mtree Wind Offset is for fine tuning the Mtree Wind, if a behaviour is too much or anything other is not as desired.

Billboard Wind is by default off.

Mtree Documentation v 2.5.3

Property	Explanation
Wind Zone	If Wind Zone is assigned, Mtree Wind will execute from there.
Wind Strength	Main Global Wind Strength
Wind Direction	Main Wind Direction
Wind Pulse	Wave Speed
Wind Turbulence	Shivering of the Leaves
Billboard Wind	Toggle for Billboard Wind
Billboard Wind Influence	How much the Main Wind impacts on Billboards

Adding a Global Wind Controller

Mtree Wind Controller can either be attached by script, Add Component on a GameObject, or by opening the Menu: "*Window/Mtree/Add Mtree Global Wind Controller to Scene…*".
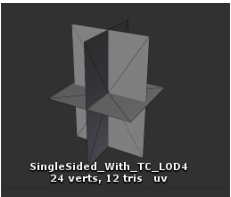
This will add a WindZone and the Mtree Wind Script to the Scene at Position (0,0,0).

Mtree Documentation v 2.5.3
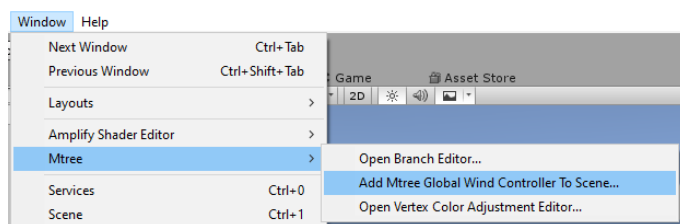
4. Billboard

Overview

in Mtree 2.3 you can now select between four different Billboard types.

	Type	Verts	Tris	Textures	Shader Culling	Explanation
DoubleSided_No_TC_LOD4 8 verts, 4 tris uv	Double Sided without Topcard	8	4	2	Off	Less geometry used.
DoubleSided_With_TC_LOD4 12 verts, 6 tris uv	Double Sided with Topcard	12	6	3	Off	Less geometry used & Looks good on fly overs.
SingleSided_No_TC_LOD4 16 verts, 8 tris uv	Single Sided without Topcard	16	8	4	Back	More detailed.
SingleSided_With_TC_LOD4 24 verts, 12 tris uv	Single Sided with Topcard	24	12	6	Back	More detailed & looks good on flyovers.

Billboard settings
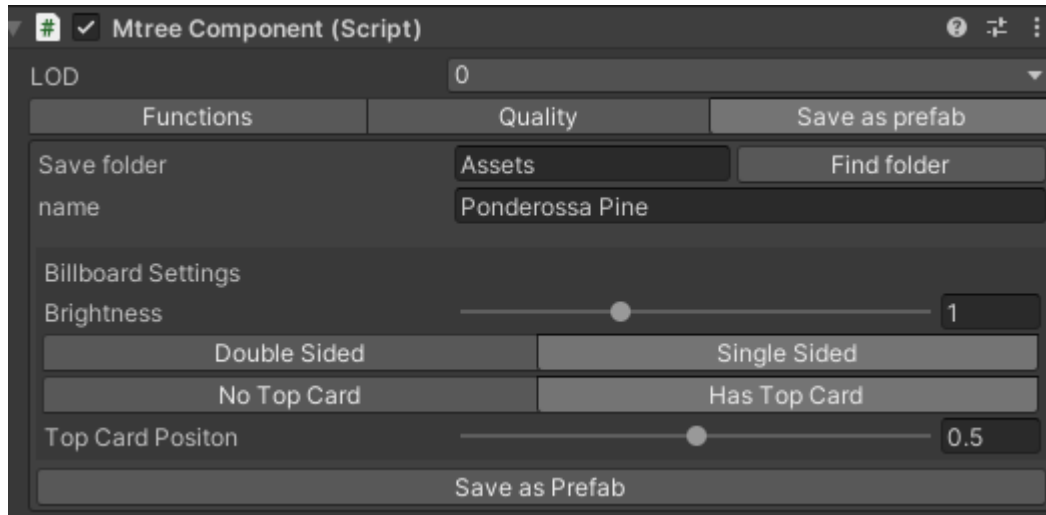
| Property	Explanation
Brightness	Brightness of the Render captured from the Tree.
Double Sided / Single Sided	How the Mesh is created.
No Top Card / Has Top Card	Adding a Topcard to the BB..
Top Card Position	Height position of the Top Card (0 = Bottom of BB, 1 = on Top of BB).

5. Branch texture editor tool

Preamble: it is often more difficult to find branch textures than to find leaf textures. However, using branch textures is known to be more optimal, that is why Mtree offers you a unique and simple tool that creates a branch texture from a leaf texture, and then uses it as a leaf shader.

Getting started with the Branch Editor

Open the Branch editor

You can find it in **Window ⏸ Mtree ⏸ Open Branch Editor**
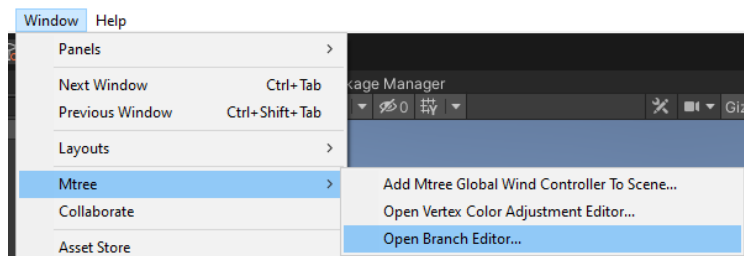
Create a basic Branch Texture

The two most important settings are the leaf texture and the bark texture.

After assigning those two textures, play with all the other parameters until you are satisfied with the result. You can find the exhaustive description of all parameters in the next chapter.

Choose the size of the generated texture. Once you are satisfied with the result and want to save the texture, click on **save texture**.

Standard and Enhanced Mode

Since Mtree 2.2 you can switch between Standard (Procedural generated Normals) and Enhanced Mode, which is available when you add Normal Maps to the given Properties.

Warning: if any of the Bark or Leaf Normal Properties are empty, Enhanced Mode won't be available to use.

Use Normal Rotation only if the Normals in Enhanced Mode are incorrect. You can hit Show Normals / Show Textures button to switch the view.

Warning:

If you are not on the Standard Pipeline and using the Branch Editor, Mtree will switch Automatically Pipelines as long as you use the Branch Editor (your Materials get Pink), and switch back, when closing the Editor Window. This action does not break your Scene Setup.
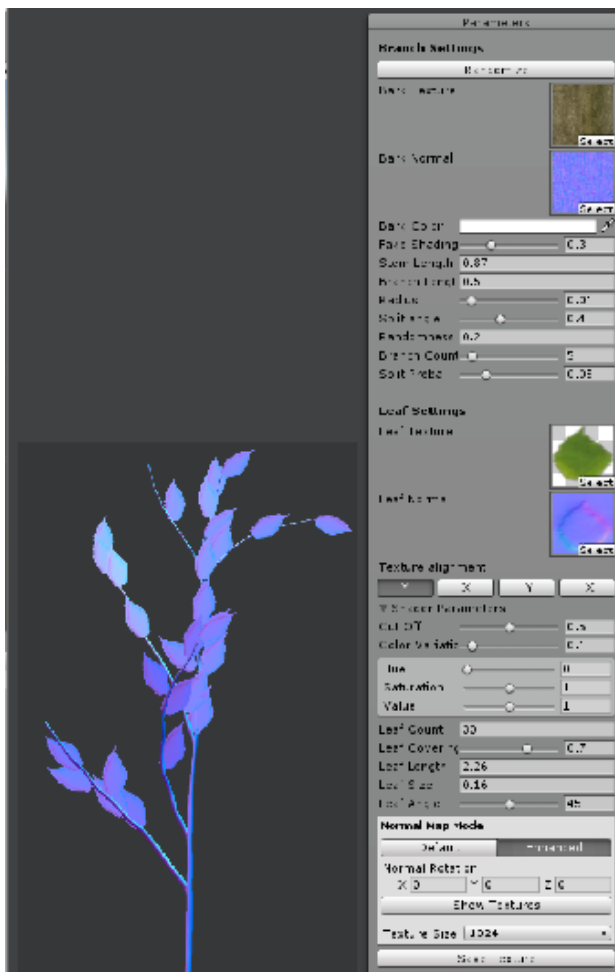
6. Exhaustive list of the Branch Editor parameters

Branch settings

Parameter	Description
Randomize	Change the seed of the branch.
Bark Texture	The texture you choose for the bark.
Bark Normal	
Bark Color	The color of the bark.
Fake Shading	How "3D" the bark appears.
Stem Length	The length of center branch
Branch Length	The length of the side branches
Radius	The radius of the branch.
Split angle	The angle between the newly created branches and the stem.
Randomness	How irregular the branches look.
Branch Count	The number of side branches.
Split Proba	The probability for a branch to fork into multiple branches.

Leaf Settings

Parameter	Description
Leaf Texture	The texture of the leaf.
Leaf Normal	
Texture Alignment	The rotation of the leaf texture.
Cut off	Threshold at which a pixel is considered transparent.
Color variation	

Hue	The tint of the leaves.
Saturation	How strong the colors are.
Value	How dark the leaves are.
Leaf Count	How many leaves there are on the branch.
Leaf covering	How the leaves are concentrated towards the extremities of the branches.
Leaf length	How long the leaves are.
Leaf Size	The size of the leaves.
Leaf angle	The max angle between a leaf and the branch it grew from.

7. Mtree compatibility with pipelines version

Mtree is compatible with most versions of the Unity pipelines: you need to import the corresponding Mtree SRP package for the pipeline version you are using.

Pipeline	*Pipeline version*	*Mtree SRP package to use*
HDRP	HDRP < 4.9	not supported
	HDRP 4.9	4
	HDRP 4.10	
	HDRP 7	7.1.8
	HDRP 8	
	HDRP 10	10
	HDRP 11	11+
LWRP	LWRP 4	4
URP	URP 7	7.1.8
	URP 8	
	URP 10+	

Mtree Documentation v 2.5.3

8. Creating your own asset for the Asset Store

What file can I use ?

- All the Trees, which are saved as Prefabs and made with Mtree can be used for your Asset.
- The Leaves, Bark,Billboard Shader and all the Shaders in the SRP folders.
- The Mtree Wind Script.

You are not allowed to use anything else, to provide a new Asset on the Asset store! („For example: Source Code, Textures, etc.")

If you're making a Game, and do not sell any Part of this Asset for production, you're free to use anything under the EULA from the Asset Store!

Licensing
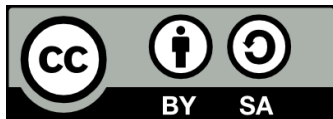
This Asset is governed by the Asset Store EULA (https://unity3d.com/de/legal/as_terms); however, the following components are governed by the licenses indicated below:

2020©by Maxime following files are available under a Creative Commons Attribution-ShareAlike 4.0 Licence(international):

- Mtree/Shaders/Legacy/Leaves.shader

- Mtree/Shaders/Legacy/Bark.shader

- Mtree/Shaders/Legacy/Billboard.shader

- Mtree/Scripts/MtreeWind.cs

- Mtree/SRP/...

https://creativecommons.org/licenses/by-sa/4.0/legalcode