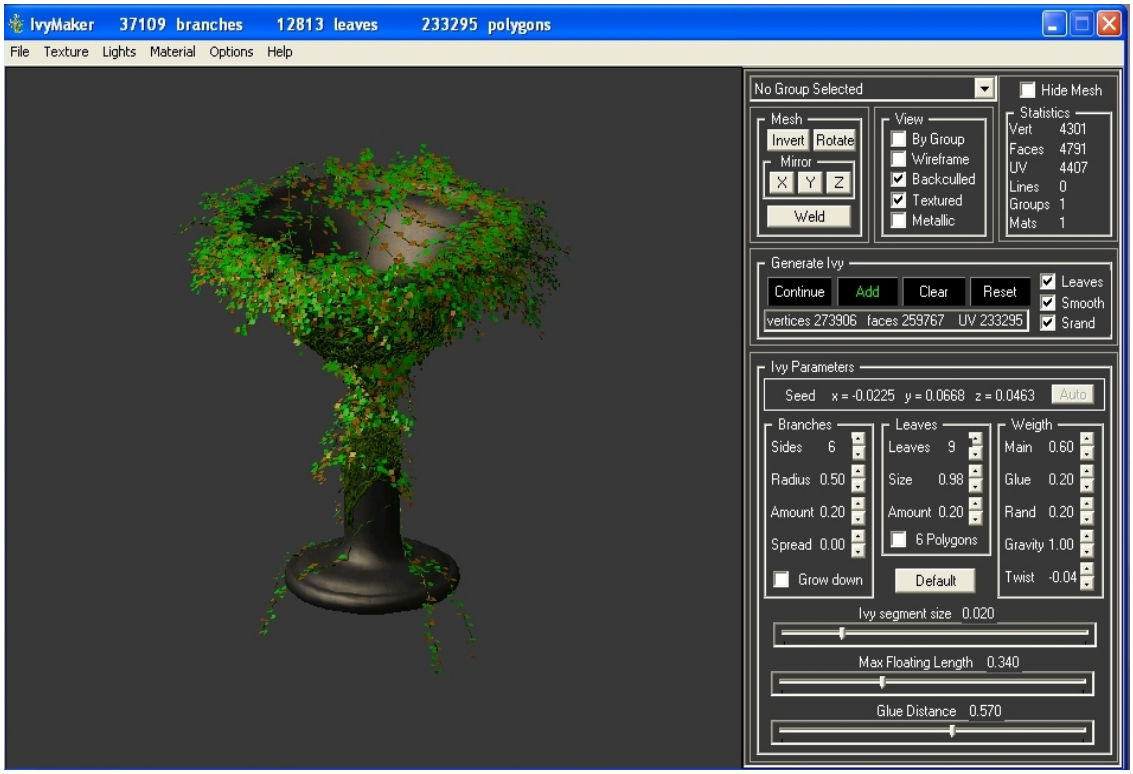
Ivy Maker



Introduction

This little stand alone utility allows you to create ivy plants that grow glued to a base model.
You can use walls, stairs, columns, statues or any other object as the base model
IvyMaker is able to import models in obj, 3ds, pp2, dxf, ply, off and stl formats.
The base model can be made with triangles or quads, it makes no difference and the IvyMaker is able t load high polygon count models as big as ten millions polygons, of course the time required to generate the ivy can be large. If you keep the base model below 100K polygons the ivy will be generated very fast.

IvyMaker is very easy to use with a very intuitive interface that only use the mouse, no keyboard typing required
Thee are many parameter dials that provides a great control of the generated ivy.

Warning

.The IvyMaker is a very fast ivy creator, so it can create an ivy mesh of 500,000 polygons in less than a minute. So if you don't take care the created mesh can be very big making your renderings very slow. For practical reason I have limited the created ivy mesh to one million polygons, even IvyMaker is able t create more larger meshes.
You have many parameters to have the polygon count under control and creating good quality ivies with a reasonable polygon count size.

Texturing

The created ivy is UV mapped. For branches the U coordinate is the perimeter of the branch and the V coordinate is the length. So if you wish you can apply a texture to the branches or leave them untextured that render very nice.Leaves has a simple planar texture mapping.

Leaves

The created ivy can or cannot have leaves. When has leaves the number of leaves can be very large, so is very important to make each leaf as simple as possible to have a polygon count reasonable.

You can have two classes of leaves: A simple leaf that has only one face and is a square. You can apply a texture, but the shape still continue to be a square. You can use a transparency map and so you will have an excellent rendering, but very slow. Transparencies take a long time to be rendered and all is multiplied by the number of leaves. Depending on the scene is just enough to do nothing, no textures, no transparency map, only a green square is just enough.

The other class of leaf is a leaf with 6 polygons that has the shape of a leaf and does not require a transparency map. It can be textured or not.

You have increased the polygon count, but it renders faster.

The last thing about leaves is that the laves have two materials, so you will have an ivy with two colors or just use the same material settings for both materials.

Base Model

An ivy is not a tree or a bush, so to grow needs something where it can glue. This is the base model. It cam be something as simple as a square for a ground ivy or something complex as some architectural building.

You must set a point where the ivy begins to grow, it is the "seed". You can set many seed points creating multiple ivies for a more complex ivy pattern.

Display Window Interface

On the left side of the IvyMaker you have a window where you can see the base model and the ivy being generated. With the mouse left button you can rotate the model and with the mouse right button you can zoom the model.

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Parameter Dials

On the right side of the IvyMaker you have the parameter dials. They only respond to the mouse. Clicking on the up or down arrows it will increase or decrease the value of the parameter. Holding the mouse button on these arrows the value will increase or decrease automatically.

How to Install

No installation required, no serial keys and no activation Just put the IvyMaker folder in any place and click on IvyMaker.exe or create a shortcut to it in the desktop.

How was created

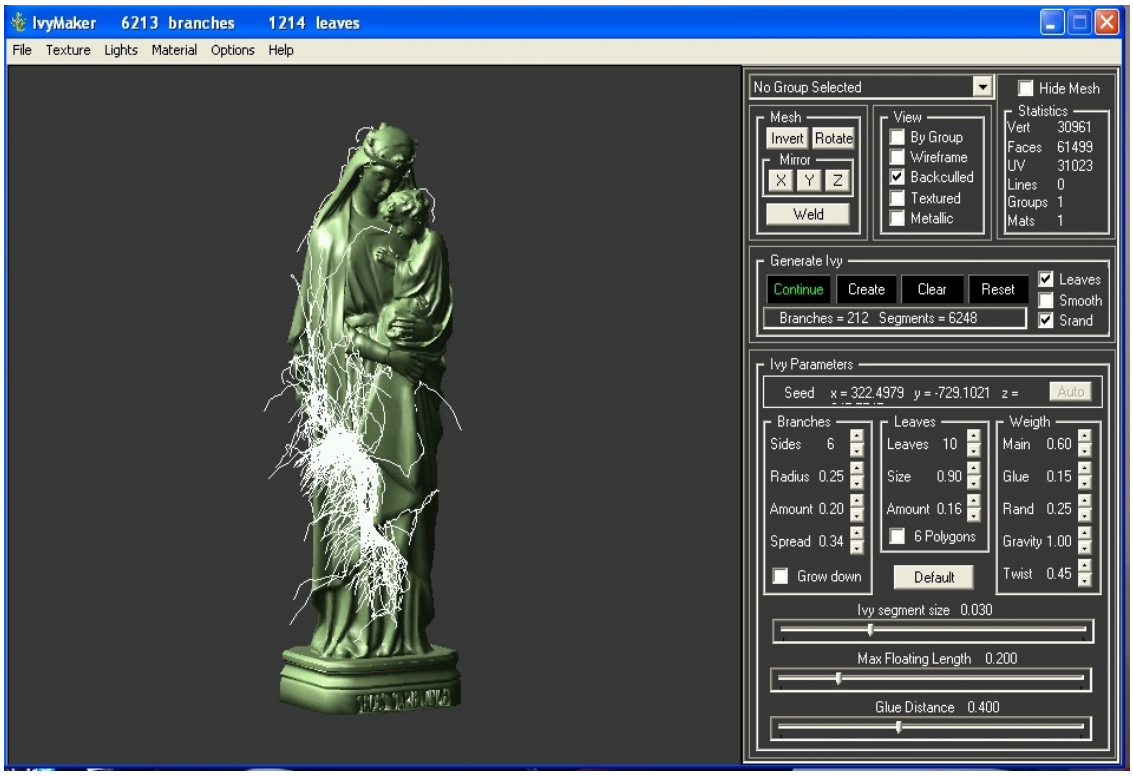
The IvyMaker was made with plain C and assembly language.

This program uses an internal very fast proprietary (Kawecki) rendering engine that does NOT use neither OpenGL nor DirectX, is very much faster that those, and does not require neither use video card processors.

No dll required and no registry entry is used. Only one exe file that is like a portable executable without the need of any virtualization.

System Requirements

Computer: Any modern PC Intel or AMD x86 or x64 and any video card.
Windows: Windows XP, Vista, 7,8,10 (32 or 64 bits).


IvyMaker 6213 branches 1214 leaves
File Texture Lights Material Options Help
No Group Selected
Hide Mesh
Mesh
Invert Rotate
Mirror
X Y Z
Weld
View
By Group
Wireframe
Backculled
Textured
Metallic
Statistics
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Faces 61499
UV 31023
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Groups 1
Mats 1
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Continue Create Clear Reset
Leaves
Smooth
Srand
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Ivy Parameters
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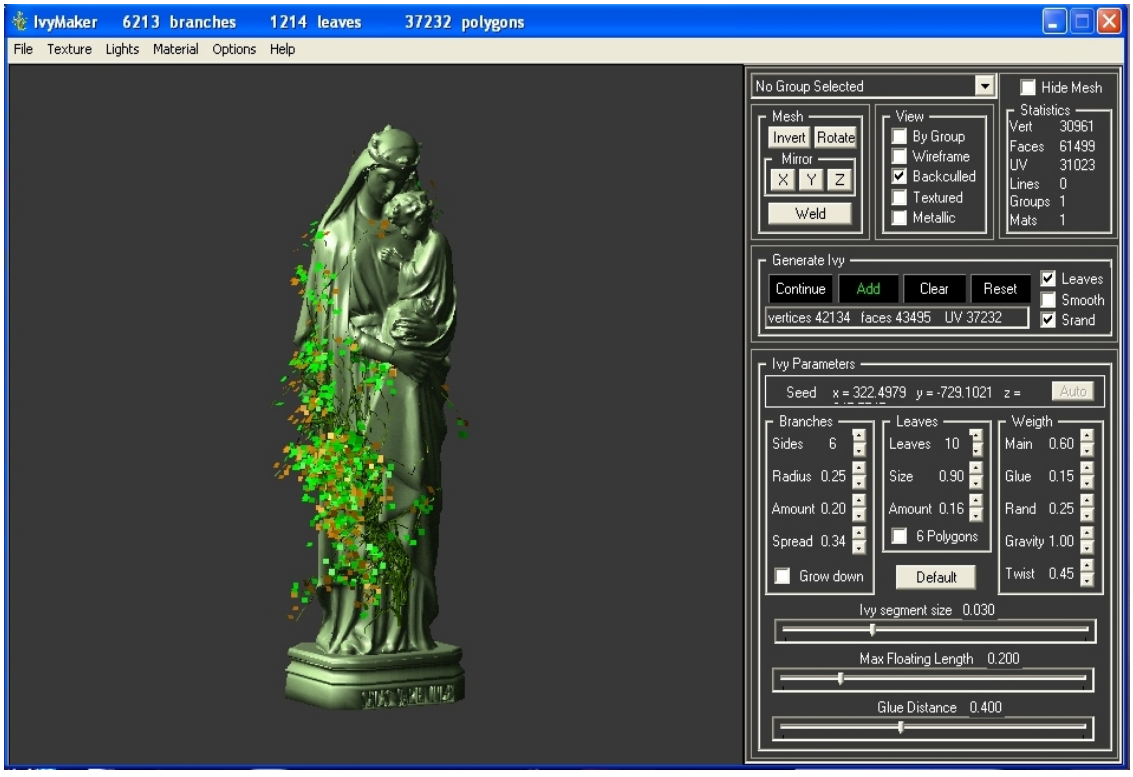
Auto
Branches
Sides 6
Radius 0.25
Amount 0.20
Spread 0.34
Grow down
Leaves
Leaves 10
Size 0.90
Amount 0.16
6 Polygons
Default
Weigth
Main 0.60
Glue 0.15
Rand 0.25
Gravity 1.00
Twist 0.45
Ivy segment size 0.030
Max Floating Length 0.200
Glue Distance 0.400


IvyMaker 6213 branches 1214 leaves 37232 polygons
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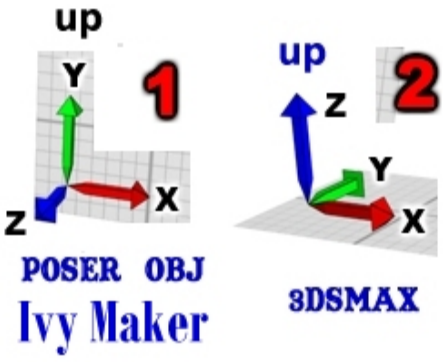
Glue Distance 0.400

Loading the Base Model

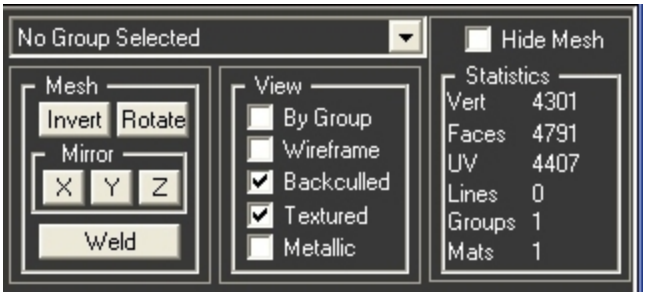
In the **file menu** you can load or import the model that will be used as base model for the ivy generation. You can load meshes in **obj**, **3ds**, **dxf**, **pp2**, **ply**. **off** and **stl** formats.

Ivy Maker Coordinate System

The Ivy Maker use a coordinate system where the y axis is up, x left-right and z front-back.
Your base model maybe was created using a different coordinate system, so if not corrected the ivy will grow in the wrong direction.
With **3ds** model it is not a problem because IvyMaker does the conversion automatically.
In other cases you must do the conversion by yourself, if it is the case. Ivy Maker provides some tools for the task.



Base Model Tools



Invert: Inverts the mesh normals

Mirror: You can mirror the mesh in the x,y,z direction.

Wireframe: Display the model in wireframe form.

Textured: You can see the model with a texture applied

By Group: Once checked enables the combo-box above where you can select a part of your model selected by group or material, if exist any.

Rotate: Rotates the model.

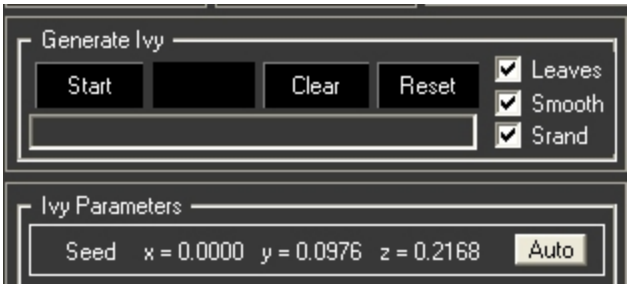
Weld: You weld all the vertices that have the same value.

Backculled: Makes invisible the faces that are looking back

Metallic: You see the model with a reflective metallic surface.

Hide Mesh: It hides the base mesh allowing you to see only the created ivy.

Ivy Generation



Seed

The seed is the starting point from where the ivy begins to grow. You can set the seed point in an automatic way with the **Auto** button or in a manual way right-clicking with the right button of your mouse on some point of the base mesh.
The **Auto** button will set the seed somewhere in the bottom or top of your base model depending if the ivy grown up or grown down. You will see the seed point as a red dot on your base model.
If you are having troubles on setting the seed point in a manual way, turn the display to wireframe mode and right-click on some vertex of the model.
You only can set the seed point before the ivy begins to grow (start button is visible). Once the growth has started the seed point has no more use. You can only change it again after clicking clear or reset and all the process begins again.

Start

Once you set the parameters and seed position you can begin the ivy generation process clicking the **Start** button. The **Start** button will change into the **Continue** button.

Continue

Clicking on the **Continue** button the ivy begins to grow, you will see it as an ivy skeleton in th display window. You can make the ivy grow clicking the continue button, holding the mouse left button on the continue button, clicking the keyboard enter key or holding down the keyboard enter key. You can change the ivy parameters at any time and return to the growing process with the continue button.
You can save at any time the ivy preview skeleton without leaves using the file menu, but it will export as an obj file with lines and not faces like a dynamic hair. Poser is able to render it, but not all the other 3d softwares are able to do it

NOTE: It can happen that the ivy generation has reached a dead-lock where no new branch is possible, the ivy stopped growing and the Continue button vanishes. In this case if you want the ivy to continue growing you must change the ivy parameters, clear or reset and start all again. Some possible causes are **Ivy segment size** too big, **Max floating length** too small or branches **amount** too small.

Reset.
Clears all what you have done returning to the **Start** point.

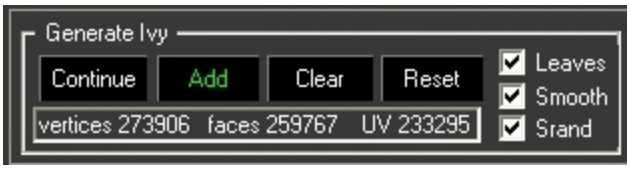
Clear.
With single ivies is exactly the same as the **Reset** button, but with multiple ivies it only clear the latest ivy and not the other **"Added"** ivies (See later what is Add)..

Leaves
Checked the ivy mesh will have branches and leaves, unchecked the ivy will have only branches.

Smooth
Checked the ivy will be generated smoothly with time (slow grow).
Unchecked the ivy generation will be faster with a lot of branches created in each step.

Srand
If checked it will reset the random number generator used by the IvyMaker each time you press the **Reset** or **Clear** buttons, so with the same parameters the IvyMaker will generate the same mesh. Without resetting, each created ivy will be different due to the random process.

Create
Clicking this button it creates the ivy mesh and the **Create** button turns into the **Add** button.

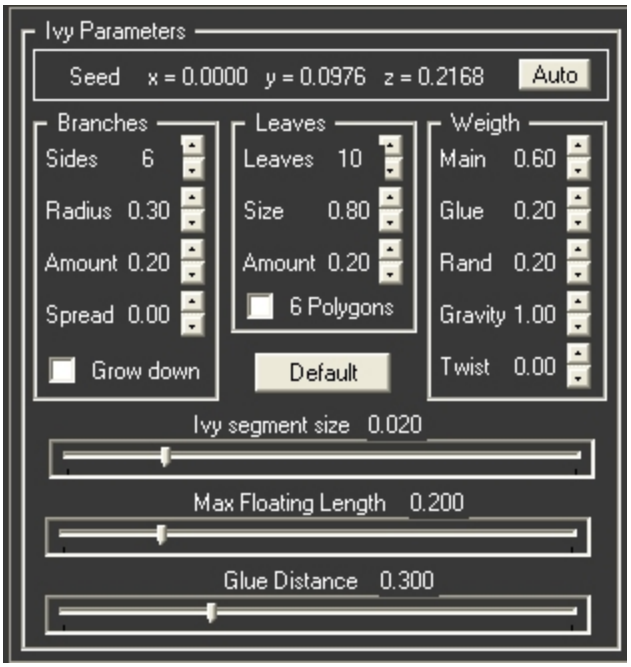


Add
Now you have several choices:
- You can save the created ivy and finish your job.
- You can click the **Continue** button and return to the growing process for a bigger ivy.
- You can click the **Add** button and the ivy is added to your job and you can create other ivy with other seed in other part of the model. The **Clear** button will not remove anymore tis ivy, only the **Reset** button can do it.

You can create as many ivies you want in different parts of the base model.

Saving the Ivy mesh
In the **file menu** you an save the ivy as obj file. You have two options for saving:
Export Ivy mesh as obj (default) : It saves the ivy with the **y axis up**
Export Ivy mesh as obj (3dsMax) : It saves the ivy mesh with the **z axis up.**

Ivy Parameters Description



Default

The **default button** will set all the ivy parameters to its default value.

Branches

Sides: The number of sides of the branch mesh. You can have branches with 1,2,3,4,6,8,12 and 16 sides. One side give the lowest polygon count for the created ivy, but each segment is only a planar rectangle. 16 sides give a nice circular tube fr for the branch segment, but you have increased sixteen times the polygon count.
A good compromise values are 6 or 8.

Radius: Gives the size of the branch segment diameter..

Amount: This value is the probability for each segment of a branch to generate another branch. A zero value will create only a single branch ivy while a value of one will create an ivy with the maximum amount of branches..

Spread: Factor that controls the angle between a child branch and its parent branch. A zero value gives a normal ivy while a one value gives an ivy with branches going away from other branches.

Grow down: Checking this box the ivy will grow down instead of growing up.

Leaves

Leaves: This value is the maximum number of leaves that each segment of a branch can have. It is only the maximum, how many leaves will have each segment will depend on other probability factors.
A zero value gives an ivy without leaves.

Size: The size of each leaf..

Amount: The probability of each branch segment to have a leaf. A low value gives an ivy with few leaves while a high value creates an ivy with a lot of leaves.

6 Polygons: Creates a six polygon leaf that has a shape of a leaf, so you don't need to use transparency map for a detailed rendering while the default leaf is only a rectangle that will need transparency map for a rendering with details.

Weight

Main: The importance of the principal direction of ivy growth (up or down).

Glue: How much the ivy is "glued" or attracted to the base mesh.

Rand: The importance of random directions for the branches..

Gravity: The importance of gravity attracting the branches toward the earth.

Twist: How much the ivy rotates around the base model. Positive and negative values. Nice for columns.

Ivy Segment Size

Is the size of each segment of a branch. Small values creates an ivy with smooth branches and more branches, but t also increase the number of polygons of the created mesh. A large value decrease the polygon count, but also increases the risk for the ivy stop growing.

Max Floating Length

Is the maximum length that a branch can have that is not glued to the base model. Small values can make the ivy stop growing while large values create too long branches that are not glued, fine for a bush, but not for an ivy.

Glue Distance

How far the branches are attracted to the base model.

Changing, saving and loading strap parameters

You can change the parameters at any time during the ivy generation process and the new parameters will be used from this point.
You can also save the used ivy parameters for later use as *.ivy file. Then you can load them again to be used in another work.
The save ivy file is a simple text file that you can edit.

Other Functions

Menu Options

File: You can load and save parameters, export the model, load your own texture and exit the program.

Texture: There are three internal textures you can apply to the base model.
You also can load your own texture under the file menu "Load texture", but you can have only one custom texture loaded at the same time.

Lights: There are three lights that you can turn on/off for different illuminations of the arc.

Materials: There are ten different materials for applying only for the base model .

Options: There are some visual options there..

About the Author

This software was created in June 2015 by the Hardware/Software Electronic Engineer and Artist Ricardo Kawecki.

I hope that you enjoy my "IvyMaker".....