

Name: Clone+
File: awClonePlus.lsc
Version: 1.2.1
Type: Modeler
Compatibility: LW9.x
Last Update: 05/08/08
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License: FREE

This program is free to distribute as long as the original ReadMe.pdf is included.

Note: As of version 1.2 the new name of this plugin is Clone+ (formerly known as Attacher). Sufficient number of features was added to justify the name change.

Description

The original purpose of the tool was to aid the user with aligning of one piece of geometry to another when the rotation angles are difficult to match manually. In the current incarnation this plugin is more of a general purpose cloning tool. It can use either vertices or polygons as placeholders for copied geometry. Generally, polygon or vertex normals are used for alignment. If such normal cannot be determined, a normal pointing in Y+ direction is used instead.

Note on interactivity

The Clone+ plugin offers some degree of interactivity. Due to the current limitations of LScript this plug-in cannot be fully interactive, that is you cannot move/rotate/zoom your modeler viewports while the plugin is active.

3 degrees of interactivity are offered. Please see the description of the *Refresh* control in the *Options* section for more information.

Please note that the performance of the plugin may decrease significantly when working with a larger number of placeholder polygons or when the objects being copied are more complex.

How to use

By default Clone+ installs in modeler under Utilities tab, "Additional" drop down menu.

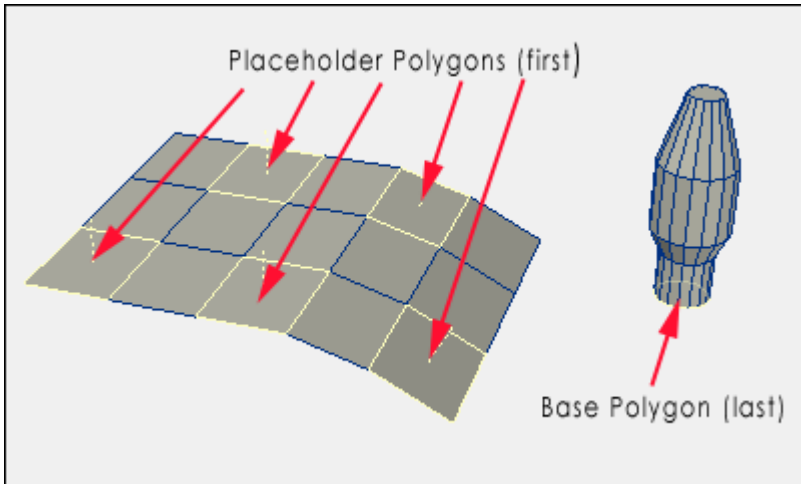
Before you run this tool, you have to prepare your selections and geometry. Clone+ accepts 3 types of initial configurations:

1. All geometry in single layer

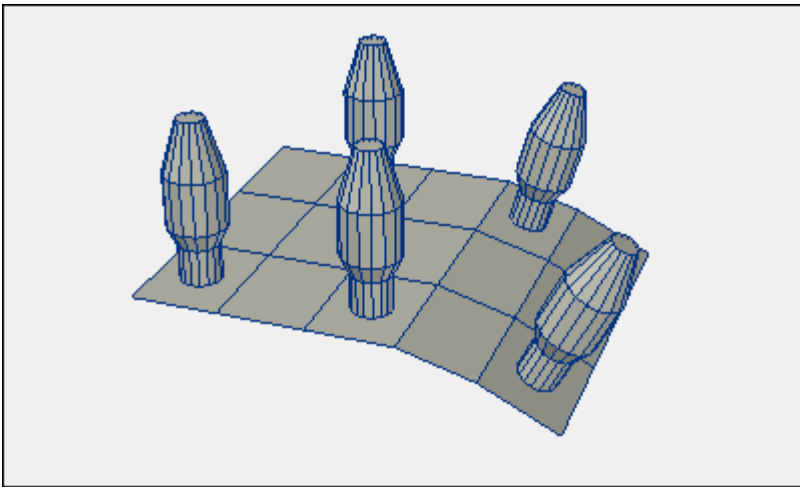
Select one or more polygons that will act as placeholders and a single polygon from the geometry that you want to attach to the placeholders. The placeholder polygons must be selected first. This allows you to use any methods or tools for selecting the polygon sets. Once the placeholders are selected, select the last polygon that acts as the base of your copied geometry. The tool automatically uses all geometry that is connected to this last polygon.

Note: The base polygon does not need to be aligned with anything. Its normal can point anywhere.

Selection



Result



Advantages of this configuration:

The base of the copied geometry can point anywhere.

Disadvantages of this configuration:

Only geometry connected to the base polygon gets copied.

2. Placeholder polygons in foreground layers, cloned items in background layers

Place and/or select all polygons that you want to use as placeholders in foreground layers. Place all geometry that you want to copy in background layers. Each background layer acts as a separate item being copied. Use separate background layer for each item.

Note: Items in background layers are assumed to point in Y+ direction. They are not be rotated prior to the cloning as it is the case with configuration 1. They are not required to be placed at the origin.

Advantages of this configuration:

- Clone and mix multiple items at once.
- Clone items containing disjoint pieces of geometry.

Disadvantages of this configuration:

- Items in background must be aligned in Y+ direction.

3. Placeholder points in foreground layers, cloned items in background layers

Everything is the same as with the configuration 2, but the placeholder points must be explicitly selected in foreground layers. If nothing is selected, all polygons in foreground layers are used.

It is clear that the disadvantages of configuration 2 and 3 are minor, but their advantages are significant. Thus, these two are probably the preferred modes of operation. However, the configuration 1 is still accepted, should there arise a need for it.

Controls:

1. General Tab

“Scale”

This control adjusts the scale of copied geometry. Values above 100% are acceptable.

“Scale to polygon”

When working with a single layer (configuration 1), each copy of the geometry is scaled according to the size ratio of placeholder polygon and the **base polygon** (not the whole geometry being copied). When working with background layers the XY size of the bounding box of the background layer is used instead to compute the ratio.

To adjust overall scale of all copies, the scale control (described above) can be used. The “Scale to polygon” option is turned on by default.

This option is turned off and disabled when working with points as geometry placeholders.

“Use Normals”

When turned on, placeholders’ normal vectors are used to rotate the items. Otherwise, the normal vector rotations are not applied. This option is turned on by default.

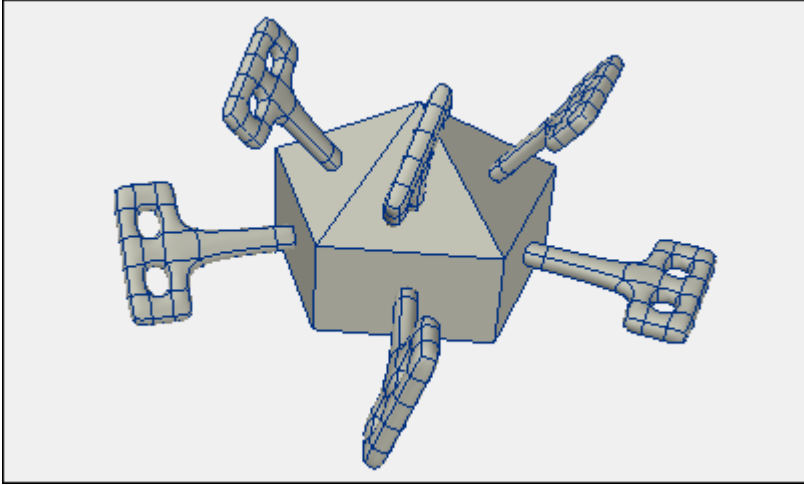
“Rotation”

The rotation angle spins each copy of the geometry around the normal of the corresponding placeholder polygon or point. This rotation remains active when *Use Normals* is disabled.

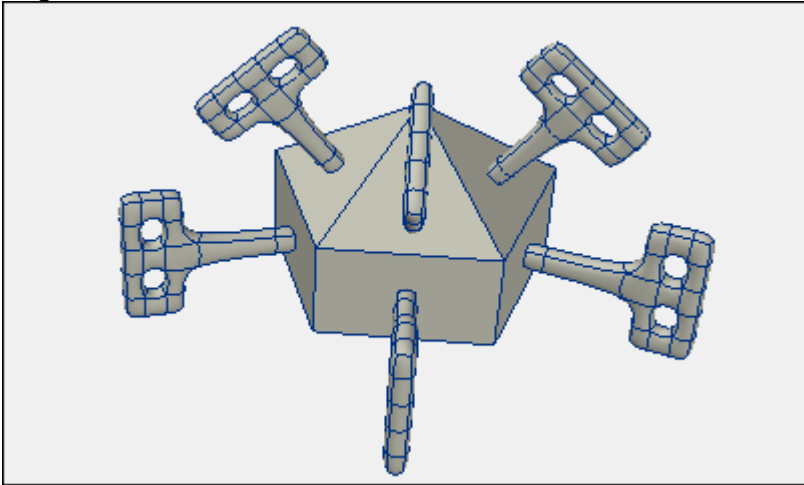
“Align”

In most cases where the placeholder polygons have their normals pointing in different directions (a ball can be a simple example) the copies of the geometry are not be aligned. This option tries to align the rotation based on the angle between the placeholder’s normal and the Y+. Please note that this type of alignment does not provide proper alignment in all cases. The *Align* option is turned off by default.

Align disabled (default)



Align enabled



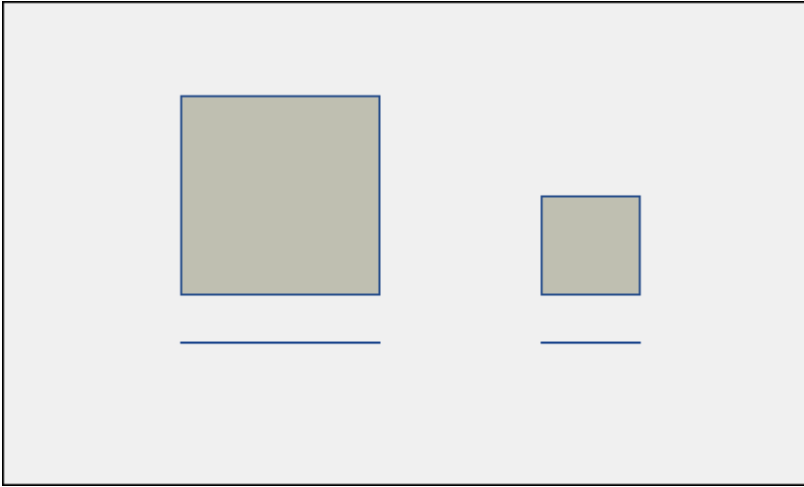
“Y Offset”

This control adjusts the offset of the copied geometry along the placeholder polygon’s normal. It can accept positive as well as negative values.

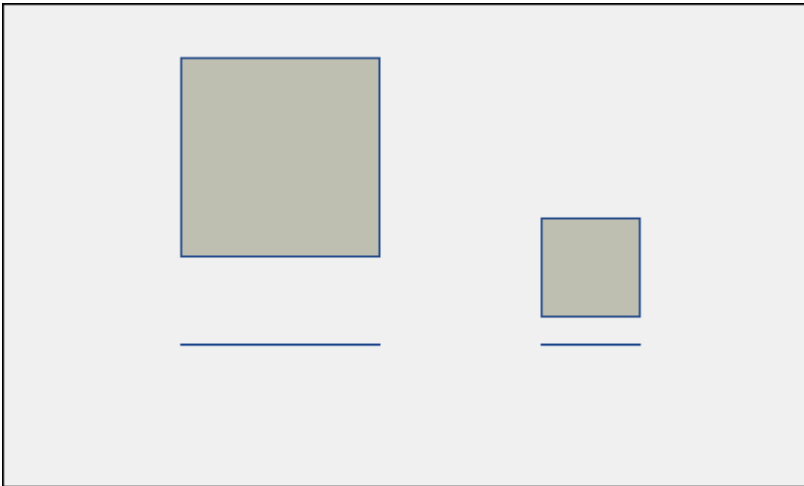
“Scale” (next to Y offset)

When checked, the amount of Y offset gets adjusted according to the scale of the copied geometry. Values that affect the Y offset when this option is checked are “Scale” (*General* tab) and “Random Scale” (*Jitter* tab).

Scale turned off



Scale turned on




“U Offset” and “V Offset”

Note: U and V correspond to the X and Y axes in copied object’s local coordinates.

These controls adjust the U and V offsets from the center of the placeholder polygon in this polygon’s UV space. These offsets work most predictably if the placeholder polygons lie in one of the axial planes (XZ, XY, etc).

2. Coverage Tab

“Area %”

This value controls the percentage of placeholder polygons or points being used. The value can range from 0 to 100. The coverage is random and can be regenerated using the  button.

“Angle”

The *Angle* allows narrowing down the number of placeholder polygons or points being used based on the angle between their corresponding normal and Y+. In other words, it measures the slope.

“Range”

This value works in conjunction with *Angle* control above and allows using placeholders whose normal angle falls within a given range from the specified angle. For example, if the *Angle* is set to 45 and the *Range* is set to 5, all placeholder geometry whose normals fall between 40 and 50 degrees are used.

“Mix Layers”

If two or more background layers are used, they are randomly mixed during cloning. Their distribution is approximately equal. This button allows generating a different distributions of cloned items. Although this control is always enabled, it has effect only when working with multiple background layers.

3. Jitter Tab

There are two common controls on the *Jitter* tab.

Randomize: 

This button generates a new set of random values for the field located next to it.

Direction: 

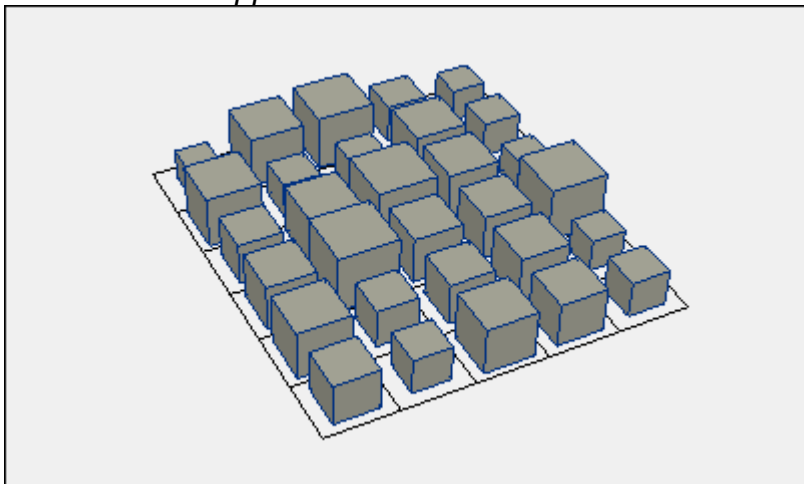
This control sets the direction for random values for the field located next to it.

For example, when the “+/-” random scale is applied the geometry can get either scaled up or down by a random value set by the field. With the “+” random scale applied the geometry gets only scaled up and with the “-” random scale applied it gets only scaled down.

“Random Scale”

This control randomizes the scale of copied geometry along the X, Y and Z axes. The value represents the maximum variation in percents. Any value greater than or equal to 0 is allowed.

Random scale applied

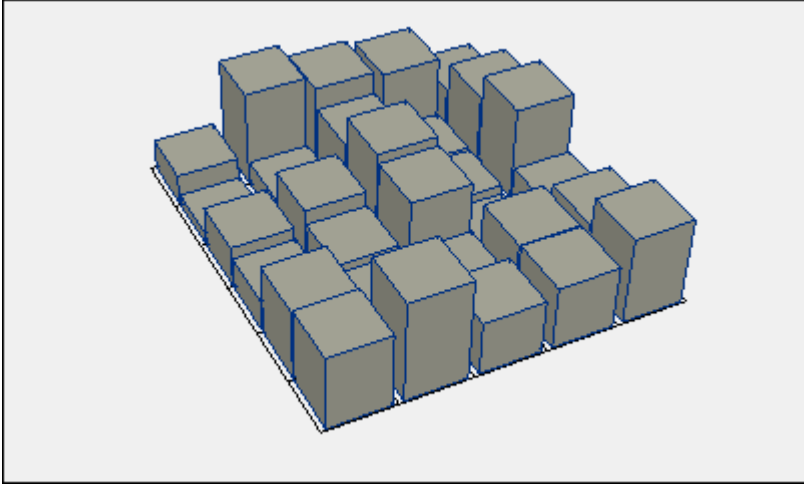


“Per Axis Random Scale”

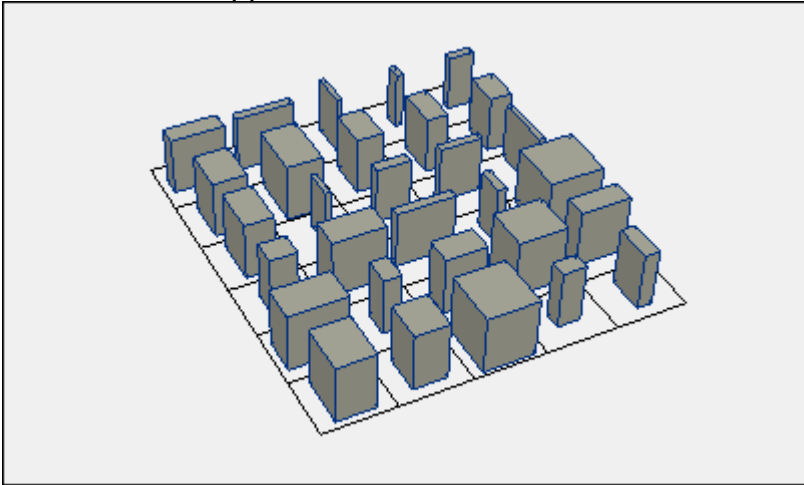
These controls randomize the scale of copied geometry along the corresponding axis. The values represent the maximum variation in percents. Any values greater than or equal to 0 are allowed.

Note: U and V correspond to the X and Y axes in copied object’s local coordinates. Random scale along the Y axis *does not* affect the scale of the Y offset (general tab).

Random scale applied to Y axis



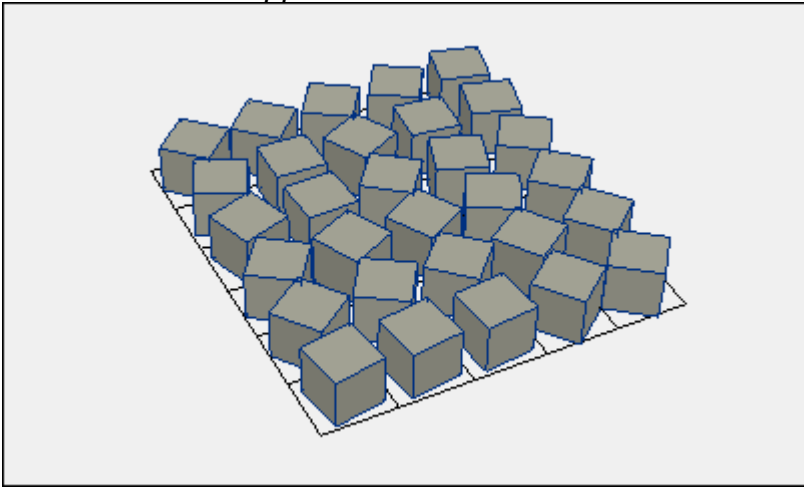
Random scale applied to U and V axes



“Random Rotation”

This control randomizes the rotation angle of each copy of the geometry around the normal of the corresponding placeholder polygon. The value represents the maximum variation in degrees.

Random rotation applied



“Mirror”

If there are many placeholder polygons selected this control can adjust how many of them have the geometry mirrored along the U axis. The value represents percentage and can range between 0 and 100.

4. Options

“Create in new layer”

With this option checked the newly created geometry gets placed in a new layer.

“Refresh”

This option allows selecting one of the three degrees of interactivity.

Real Time mode works in conjunction with the “spin” buttons: 

With *Real Time* selected all updates to the geometry are applied immediately as you “spin” through the values or type new values into any of the fields. Because the Clone+ is rarely fast enough to be interactive, this mode is rarely used.

On Release mode applies changes upon the release of the “spin” buttons or when new values are typed into any of the fields. This allows you to freely spin through the values to get the exact value before the refresh happens.

Manual mode applies changes only when you explicitly click on the *Refresh* button. *Refresh* button is always active in any of the three modes.

Tips and Tricks

The original idea for this plugin was to work with only a few placeholder polygons at a time. If you plan to use it as a cloning tool on a heavy geometry it might be better to clone the geometry in several phases using only a subset of the placeholder polygons or points during each cloning phase.

Known Limitations

Align option works well only for certain setups.

Performance issues when working with larger amounts of geometry.

History

Version: 1.2.1
Date: 05/08/08

Fixed: *mix layers* button left inactive by mistake

Version: 1.2
Date: 05/04/08

New name for the plugin: Clone+ (previously: Attacher)

Added ability to work with multiple items (including curves) in background layers

Added ability to work with points as placeholders

New tabs: Coverage and Options

Ability to define coverage based on the slope and angular range

Progress bar

Version: 1.1
Date: 09/17/07

New tab: Random

Added:

Scale Y Offset

Real time edits

Version: 1.0
Date: 08/09/07

First release

Contact

Bug reports, comments or suggestions are welcome. This plug-in has been tested to a reasonable degree and appears to behave as described. If you find something wrong with it, or have some ideas for enhancement contact me through my website. I cannot promise anything because I am not a full time developer, but I will try my best to take any comments into account.

<http://www.artssphere.com/contact.php>

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