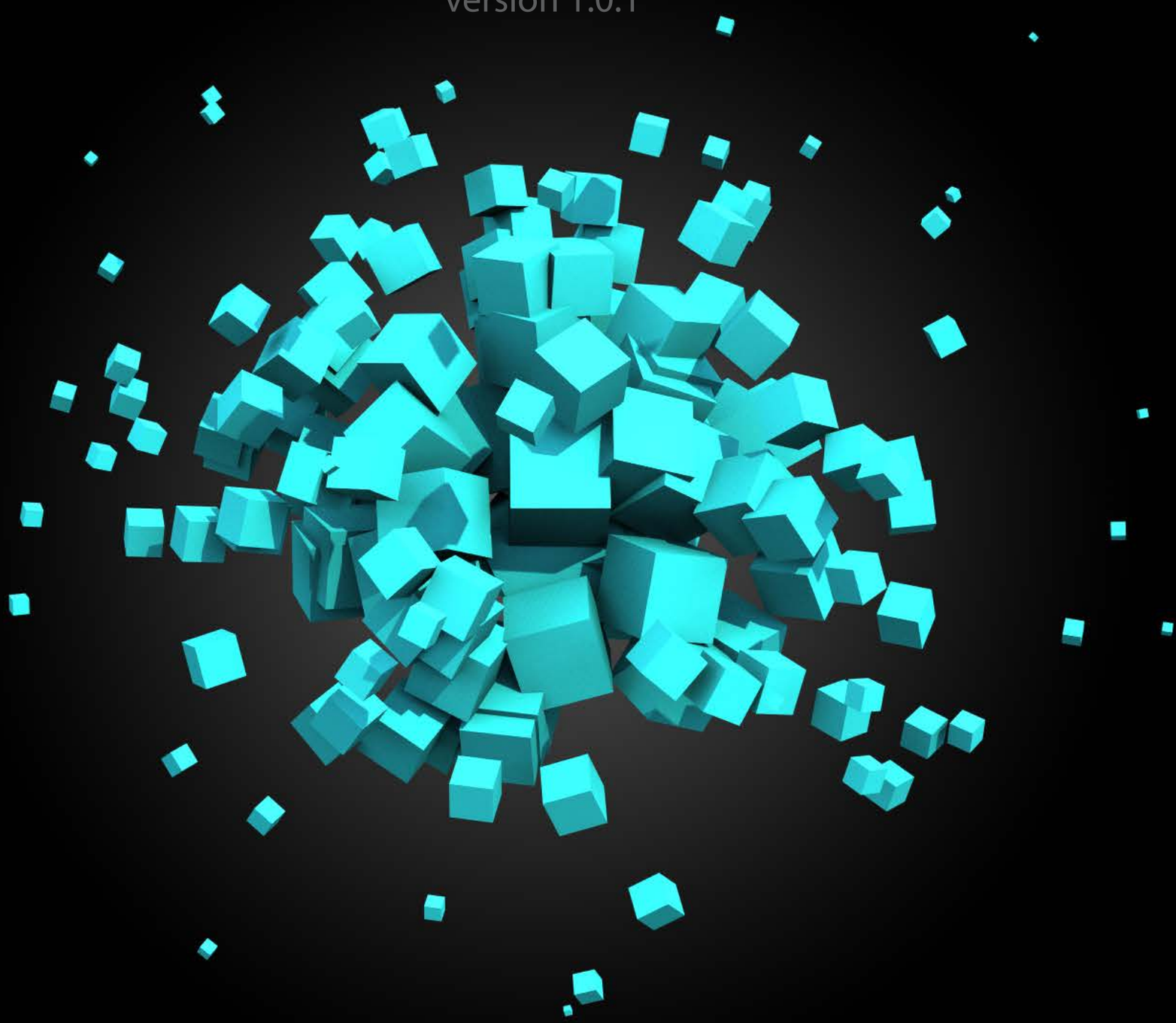
UltraScatterPro

version 1.0.1



reference guide

Contents

1 Introduction

Welcome to UltraScatterPro - an advanced solution for creating instances in Daz Studio. UltraScatterPro builds upon the ideas of UltraScatter and takes instancing to the next dimension with the ability to scatter inside volumes and create matrices in addition to scattering over surfaces.

1.1 Basic Operation

1.1.1 Surface Scatter

1. Choose the object (or group of objects) from your scene you wish to scatter.
2. Open the UltraScatterPro script.
3. Select a scatter type: Surface.
4. Choose the “Target object” from the dropdown in the script’s settings panel. This is the object that the instances will be scattered over.
5. Select the number of instances you would like.
6. Set how you would like the instances to be distributed, scaled, and rotated (see below for detailed information on all the options)
7. Press the Scatter button to create the instances.

1.1.2 Volume Scatter

1. Choose the object (or group of objects) from your scene you wish to scatter.
2. Open the UltraScatterPro script.
3. Select a scatter type: Volume.
4. Choose the “Target object” from the dropdown in the script’s settings panel. This is the object that the instances will be scattered within.
5. Select the number of instances you would like.
6. Choose whther the scatter will be random or ordered (in rows)
7. Set how you would like the instances to be distributed, scaled, and rotated (see below for detailed information on all the options)

8. Press the Scatter button to create the instances.

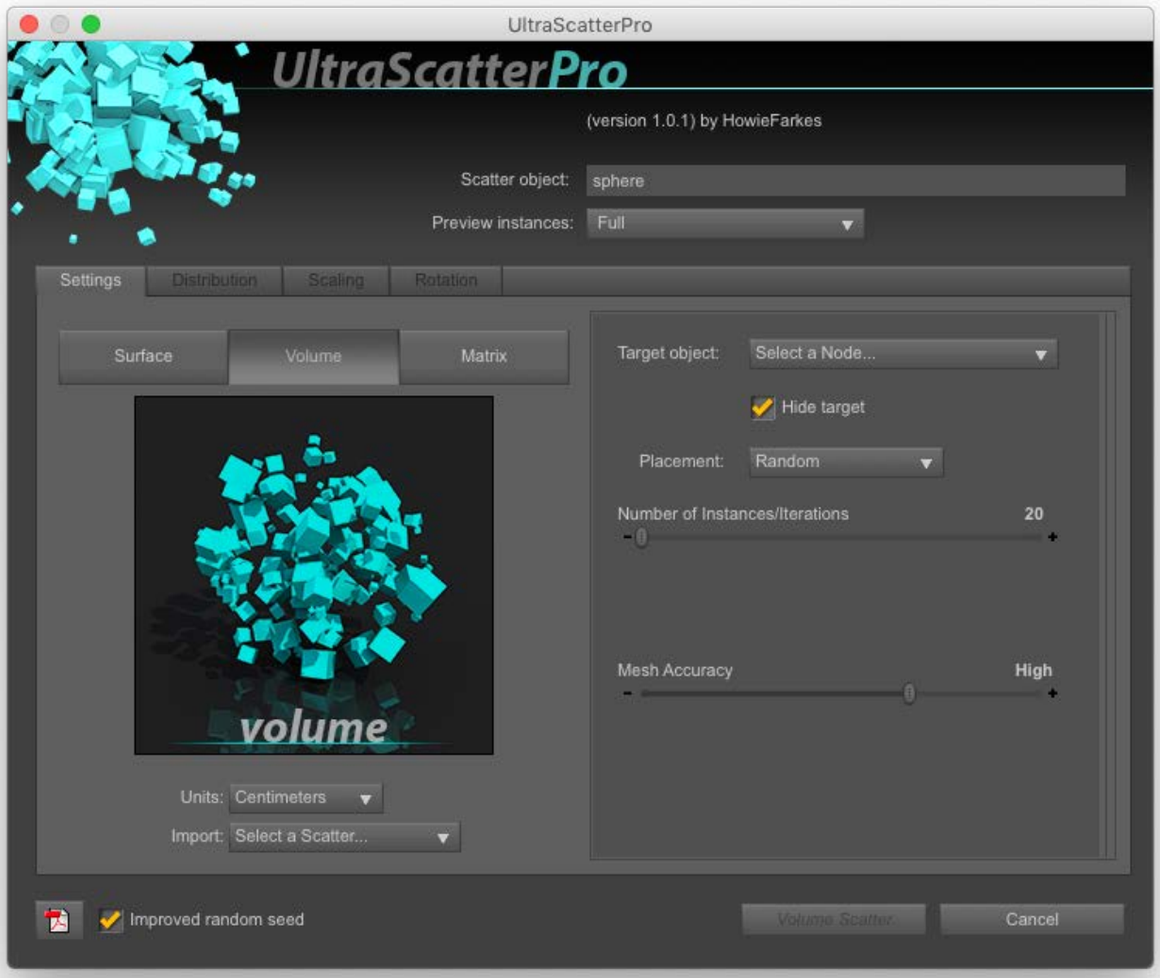
1.1.3 Matrix Scatter

1. Choose the object (or group of objects) from your scene you wish to scatter.
2. Open the UltraScatterPro script.
3. Select a scatter type: Matrix.
4. Set the number of rows in each of the 3 axes and their spacing.
5. Set how you would like the instances to be distributed, scaled, and rotated (see below for detailed information on all the options)
6. Press the Scatter button to create the instances.

1.2 Adjusting the Scatter

1. Select the group that contains the scattered instances – it will be a child group of the Target object.
2. Open the UltraScatterPro script – it will be pre-populated with the settings originally used to create the scatter.
3. Make the adjustments to the settings.
4. Press the Scatter button to re-scatter the instances.

2 Main UltraScatterPro Panel



2.1 Scatter object

This is the object (or group of objects) that will be scattered. If a group is selected then all the child objects of that group will be scattered. Objects that are already instances can not be scattered.

2.2 Preview Instances

The options here are used to determine how the instances are displayed in the Viewport. The options are:

- Object – the original scatter object is displayed for each instance (only recommended for low numbers of instances or very simple objects),
- None – no instances are visible in the viewport,
- Bounding Box – a bounding box representing the scatter object is displayed for each instance, and
- Lowres Tree – a low poly-count tree object will be used as the preview object. Suitable as a substitution for high poly-count trees in landscapes. (NB. If you use this option in a scene you wish to distribute you will need to include the following folder and its contents from your Daz 3D library – data/HowieFarkes/UltraScatter)

When re-opening an UltraScattered group with UltraScatterPro the preview can be changed without the need to re-scatter the instances. This functionality only works with scatters made with UltraScatter version 1.1.0 or later or any version of UltraScatterPro.

2.3 Improved Random Seed

UltraScatterPro uses an improved algorithm for repeatable sequences of random-like numbers in comparison to UltraScatter. By default this option is clicked on. Turn it off when using the older method of generating randomness is desired.

2.4 Scatter Button

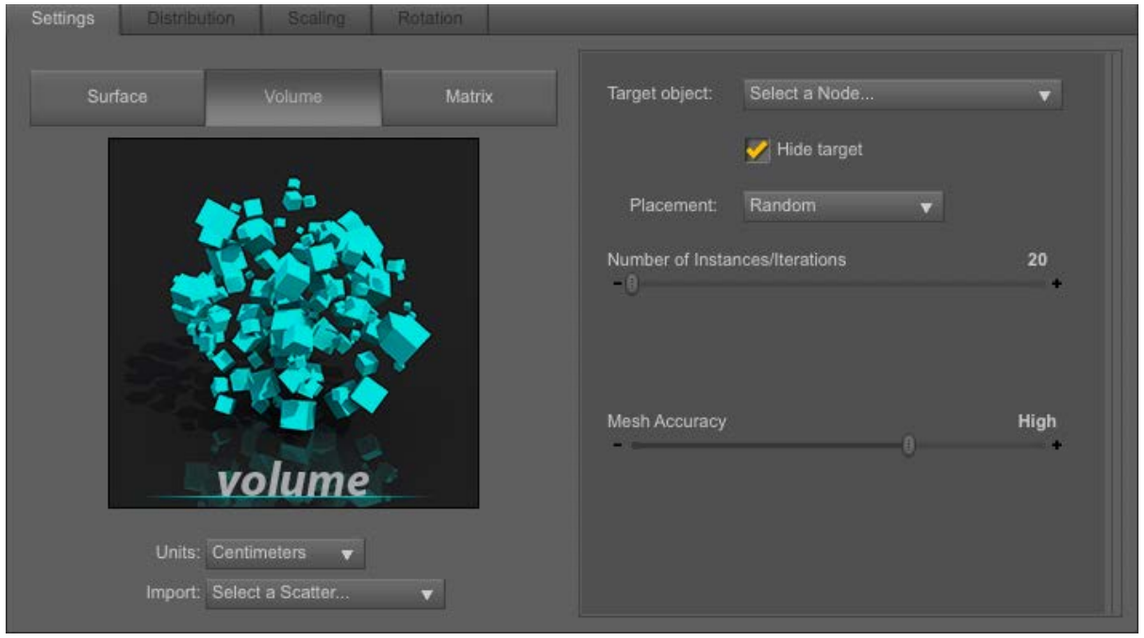
Click this button to begin the process of scattering instances.

2.5 Cancel Button

Click this button to close and exit UltraScatter without applying any changes.

3 Settings Panel

The Settings Panel is where the type of Scatter is chosen, target object if applicable, and other settings such as number of instances (or iterations), accuracy, and placement mode.



3.1 Scatter Type Buttons

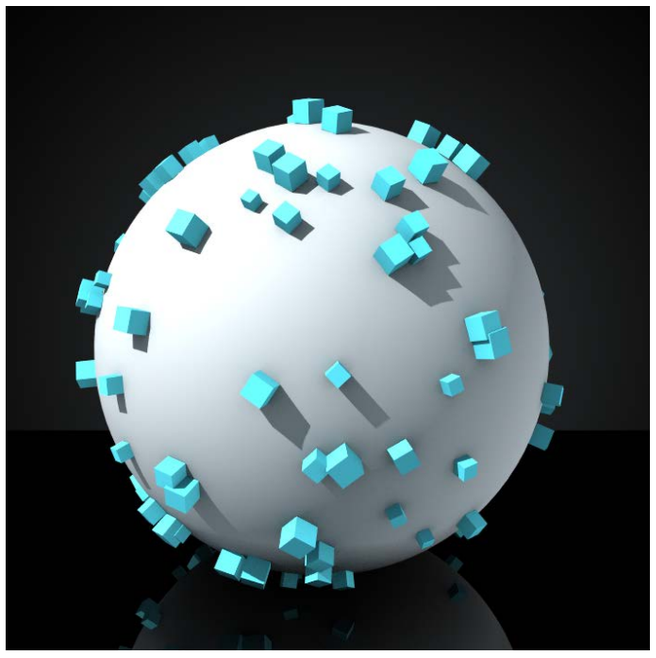
These buttons determine the type of scatter to be executed. The options are Surface; Volume; Matrix. Choosing a type of scatter will also alter the visibility of available options in the interface tabs. If a type of parameter is not applicable to the current scatter type then it will be hidden or disabled, for example image maps for distribution density will be hidden for Volume and Matrix scatters.

3.2 Units

This option sets the preferred units of measurement for use in the script. Available units are centimeters, meters, inches, feet, and yards.

3.3 Import

It is possible to load the settings from an already existing scatter present in the current scene into the UltraScatterPro window. This dropdown will list all the valid exsiting scatters from which settings can be loaded.



A Surface scatter of 100 cubes on a sphere.

NB. Loading settings from another scatter will overwrite any and all settings in the currently open UltraScatterPro window.

3.4 Surface Scatter Settings

3.4.1 Target Object

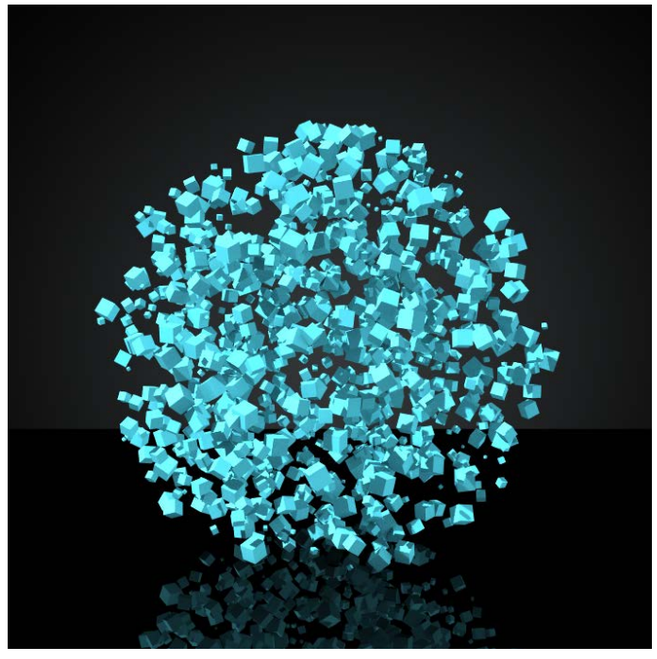
This is the object that the instances will be scattered over.

3.4.2 Limit scatter to

If the Target object contains material zones or selection sets then this option allows the selection of a material zone or selection set to constrain where instances are scattered. Instances scattered on the Target object will only appear in the selected material zone or selection set.

3.4.3 Number of Instances/Iterations

This is the maximum number of instances that will be created. If other options are used to constrain the distribution of instances over the Target object then the final number of instances created may be lower than this setting.



Instances are scattered inside the target object when using the Volume scatter type. Here the instances are randomly scattered inside a sphere.

3.5 Volume Scatter Settings

3.5.1 Target Object

This is the object that the instances will be scattered within.

3.5.2 Hide Target

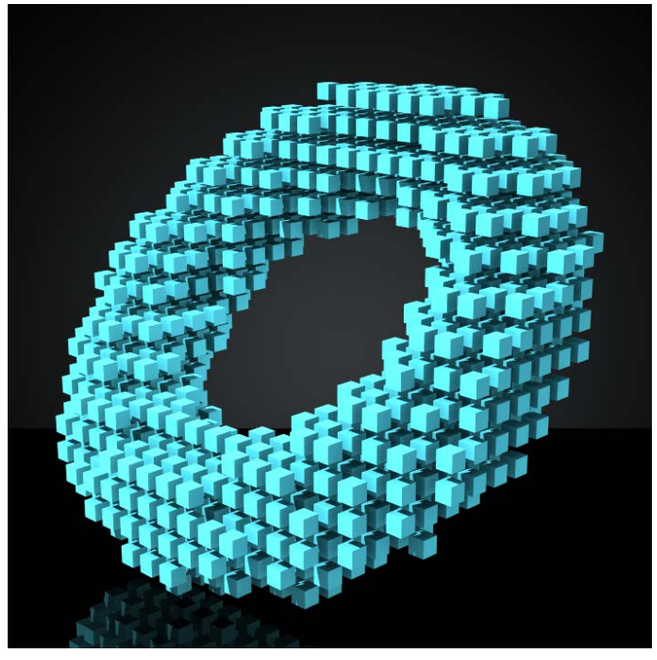
Check this option to hide the Target object in the scene and prevent it from rendering - necessary to actually see the instances scattered inside it.

3.5.3 Placement

Select whether instances will be scattered randomly or in ordered rows.

3.5.4 Number of Instances/Iterations

When using Random placement this is the maximum number of instances that will be created. If other options are used to constrain the number of instances object then the final number of instances created may be lower than this setting.



Volume scatter with ordered placement.

3.5.5 Spacing

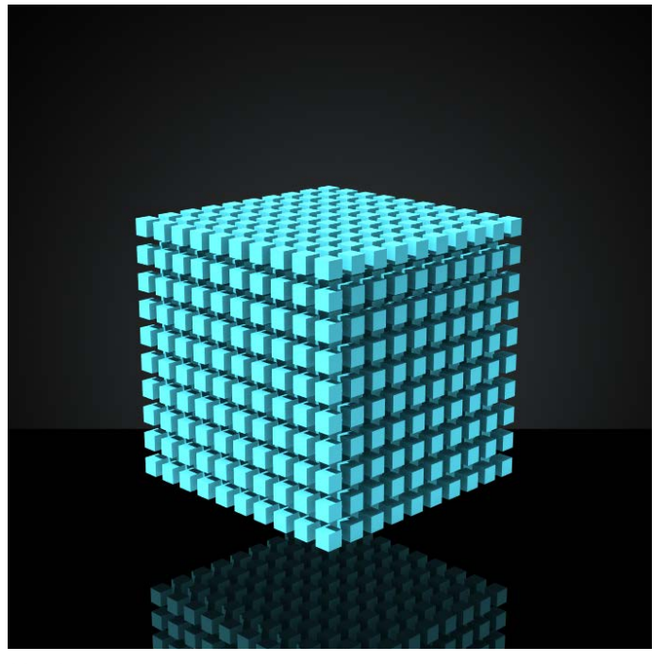
When using Ordered placement these settings set the spacing between rows in the X, Y and Z axes

3.5.6 Offset

When using Ordered placement these settings allow for every 2nd row to be offset from the preceding row. Selectthe axis on which the alternate rows will be offset. For example, to offet every second row on the Y axis, select “Y” in the dropdown and then enter the offset amounts in the “X” and “Z” boxes.

3.5.7 Mesh Accuracy

This setting determines how accurately the volume detection algorithm uses the Target object’s mesh. High polygon meshes can lead to scatters taking a long time to process so using lower settings will be faster but potenially less accurate.



Matrix scatter

3.6 Matrix Scatter Settings

These controls are specific to Matrix Scatters. Matrix scatters originate at 0,0,0 in the scene.

3.6.1 Rows

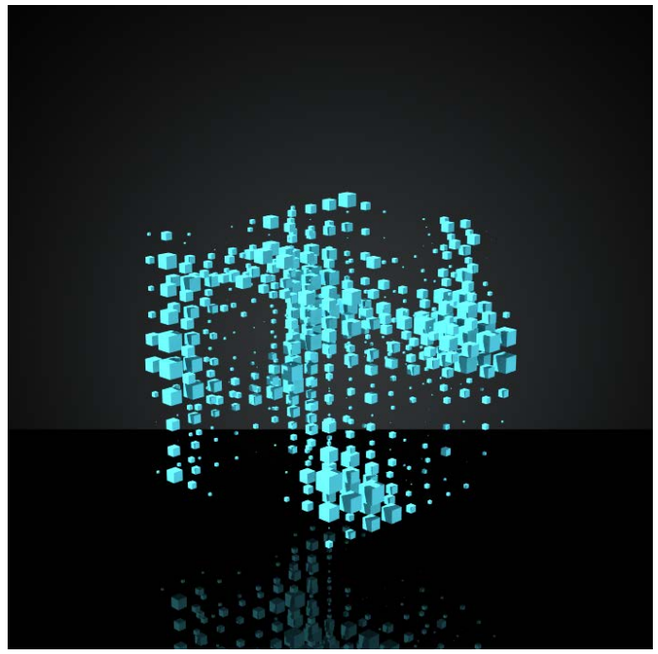
Sets how many rows of instances will be created along each axis. Each axis is limited to a maximum on 100 rows.

3.6.2 Spacing

These settings set the spacing between rows in the X, Y and Z axes. Positive values will create each row in the positive axis and negative values will create each row in the negative axis.

3.6.3 Offset

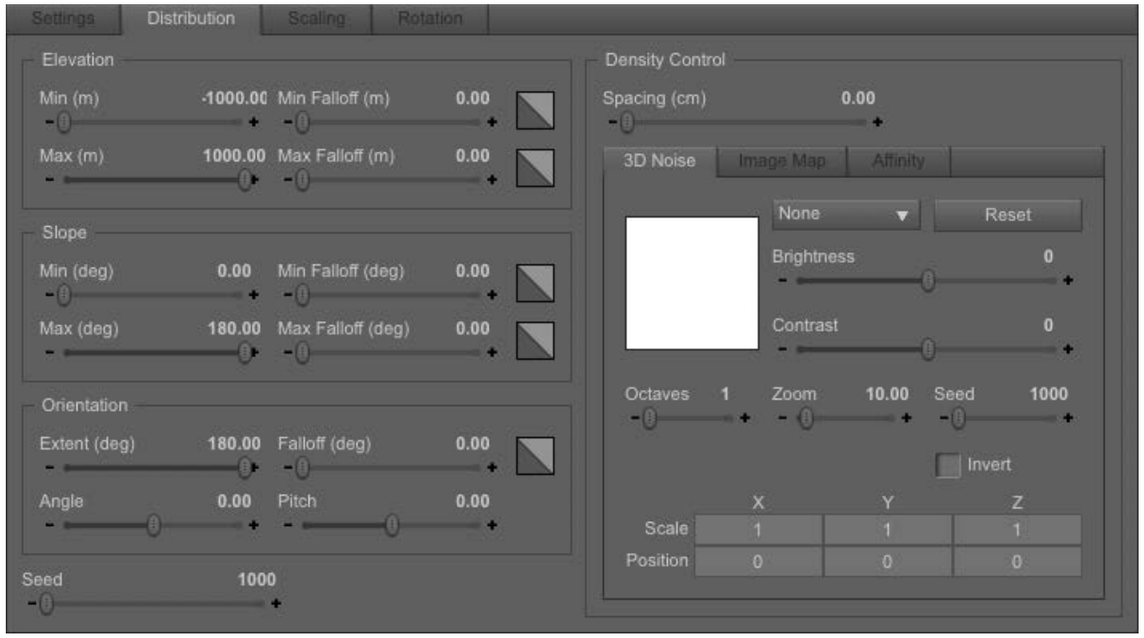
These settings allow for every 2nd row to be offset from the preceding row. Select the axis on which the alternate rows will be offset. For example, to offet every second row on the Y axis, select “Y” in the dropdown and then enter the offset amounts in the “X” and “Z” boxes.



Matrix scatter with 3D cellular noise scaling

4 Distribution Panel

The settings on this panel control the positioning and density of the instances. Some settings are only applicable to Surface Scatters and therefore will be hidden when using Volume or Matrix scatters.



4.1 Elevation

4.1.1 Min

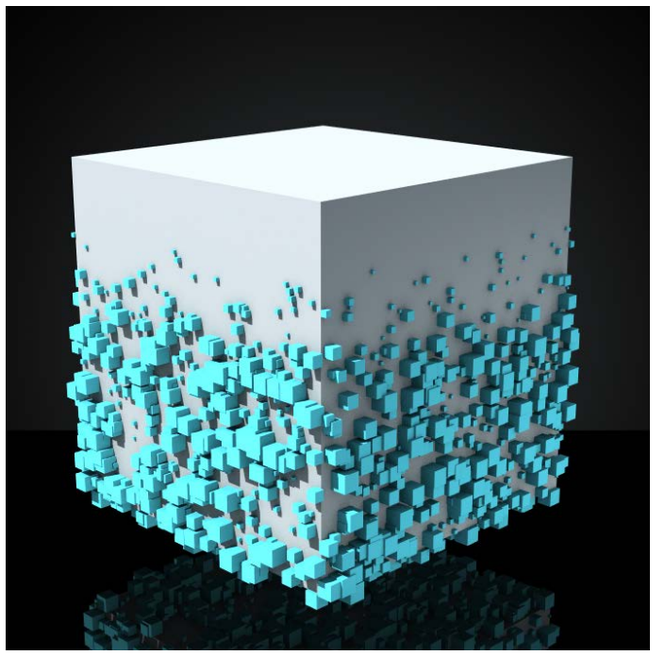
This setting determines the minimum elevation/altitude that instances can be scattered. The elevation is relative to the scene's world-space.

4.1.2 Min Falloff

This setting determines a range that the Min Elevation setting will be blended. The distribution curve of the falloff can be selected from the Falloff Curve icon to the right of the slider. See section 7.3 Concepts: Falloff Curves for more info.

4.1.3 Max

This setting determines the maximum elevation/altitude that instances can be scattered. The elevation is relative to the scene's world-space.



Instances will not be placed above the 'Max Elevation'.

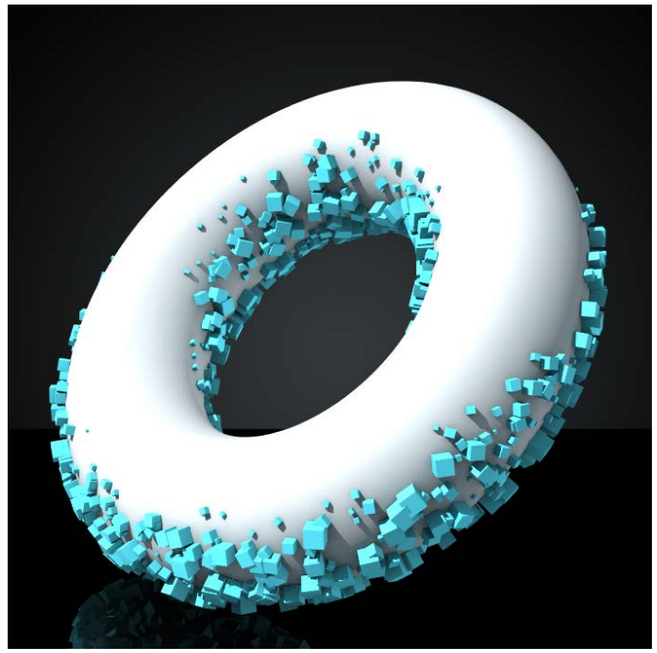
4.1.4 Max Falloff

This setting determines a range that the Max Elevation setting will be blended. The distribution curve of the falloff can be selected from the Falloff Curve icon to the right of the slider. See section 7.3 Concepts: Falloff Curves for more info.

4.2 Slope

4.2.1 Min (deg)

This setting determines the minimum slope (in degrees) that instances can be placed on the Target object. 0 degrees represents flat or horizontal areas, 90 degrees represents vertical areas and 180 represents horizontal undersides (eg. the underside of a table).



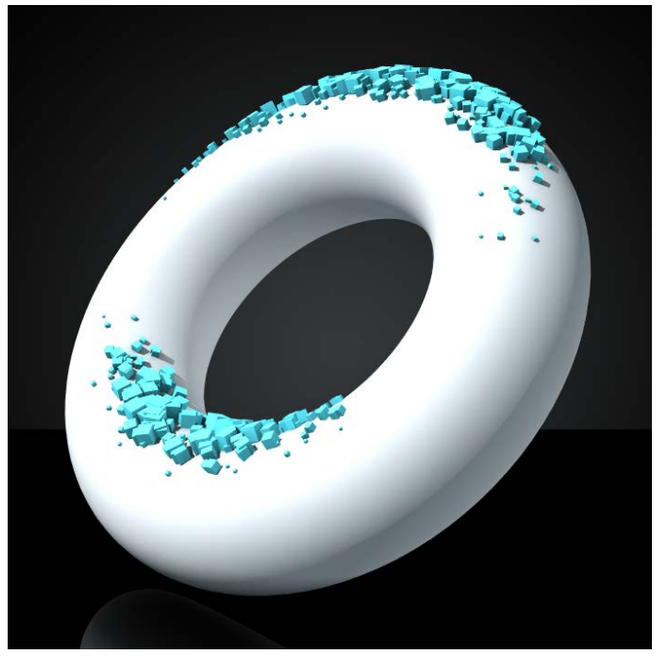
Instances will not be placed where the surface angle is less than the 'Min Slope'.

4.2.2 Min Falloff (deg)

This setting determines a range (in degrees) that the Min Slope setting will be blended. The distribution curve of the falloff can be selected from the Falloff Curve icon to the right of the slider. See section 7.3 Concepts: Falloff Curves for more info.

4.2.3 Max (deg)

This setting determines the maximum slope (in degrees) that instances can be placed on the Target object. 0 degrees represents flat or horizontal areas, 90 degrees represents vertical areas and 180 represents horizontal undersides.



Instances will not be placed where the surface angle is greater than the 'Max Slope'.

4.2.4 Max Falloff (deg)

This setting determines a range (in degrees) that the Max Slope setting will be blended. The distribution curve of the falloff can be selected from the Falloff Curve icon to the right of the slider. See section 7.3 Concepts: Falloff Curves for more info.

4.3 Orientation

4.3.1 Extent (deg)

The extent determines how many degrees away from the orientation direction that instances may still be placed. A value of 180 degrees (the default value) encompasses the entire range.

4.3.2 *Falloff (deg)*

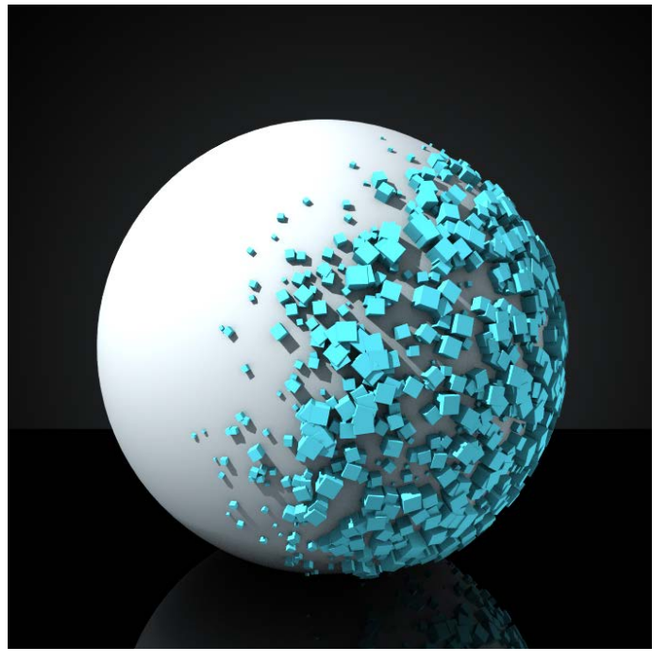
This setting determines a range (in degrees) that the Orientation Extent setting will be blended. The distribution curve of the falloff can be selected from the Falloff Curve icon to the right of the slider. See section 7.3 Concepts: Falloff Curves for more info.

4.3.3 *Orientation Angle*

The Orientation Angle is the heading direction of the orientation. 0 (zero) degrees faces along the positive X axis, 90 degrees faces along the positive Z axis, -90 faces along the negative Z axis and 180 degrees is the negative X axis.

4.3.4 *Orientation Pitch*

The Orientation Pitch is the amount above or below horizontal for the orientation. 0 (zero) degrees represents horizontal, 90 degrees represents vertically up, -90 degrees represents vertically down.



Use Orientation controls to define a surface direction that instances will be scattered upon.

4.4 Seed

UltraScatterPro uses seeded randomising when calculating instance distribution, scaling, and rotation. This setting applies to instance distribution. This means that if no settings are changed on the Distribution panel then all the instances will appear in the same position every time the Scatter Button is clicked so long as the seed number has not changed.

Drag the slider to change the seed to a different number – or alternately type in a number.

4.5 Density Control

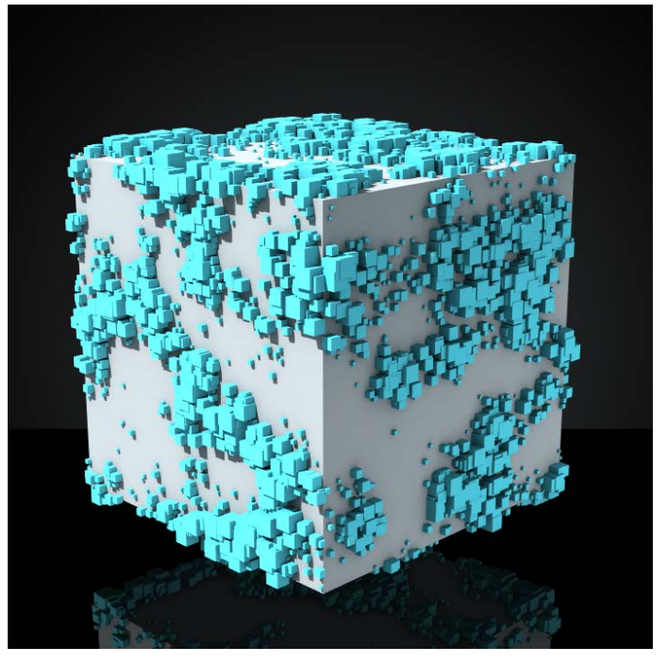
4.5.1 *Spacing*

This setting determines the minimum distance (in centimetres) between instances. Note that the distance is measured between origin or rotation points and not the instance's mesh.

The final actual distance between instances can be affected by some other options such as 5.6 Scale affects spacing and 5.7 Falloff/density affects scale.

4.6 Density 3D Noise

UltraScatterPro allows the use of procedural 3D noise to determine the density or spacing of instances. See the chapter 7.2 Concepts - 3D Noise for further explaination of 3D Noise within UltraScatterPro



"Simplex" 3D noise distribution.

4.6.1 Noise Type

Select the type of 3D noise to use, options are:

- None,
- Simplex,
- Perlin, and
- Cellular

4.6.2 Reset Button

Reset all Density Noise setting to their default values.

4.6.3 Brightness

Adjust the brightness of the Density 3D Noise.

4.6.4 Contrast

Adjust the contrast of the Density 3D Noise.

4.6.5 Octaves

The number of octaves controls the amount of detail in noise. Higher numbers increases the detail in the noise, with the added drawback of increasing the calculation time.

4.6.6 Zoom

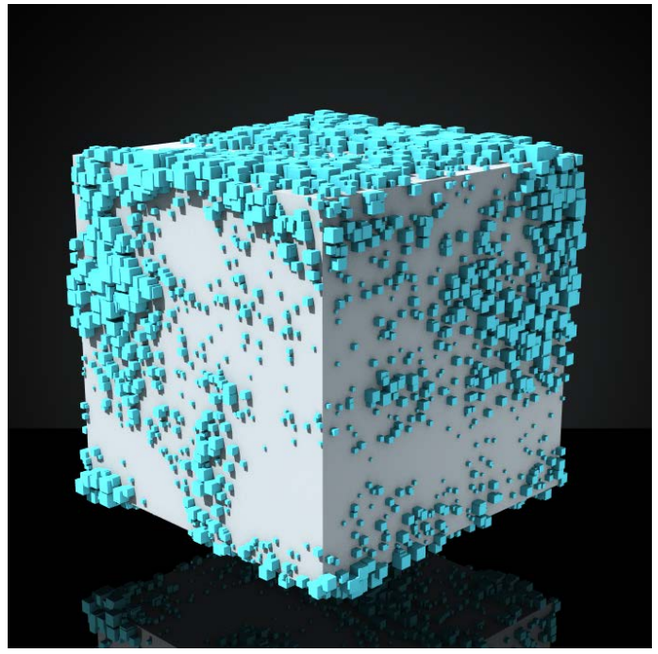
The zoom adjusts the size of the noise equally in X, Y and Z axes.

4.6.7 Seed

Change the seed setting to randomize the noise.

4.6.8 Invert

Check this option to invert (make negative) the Density 3D Noise.



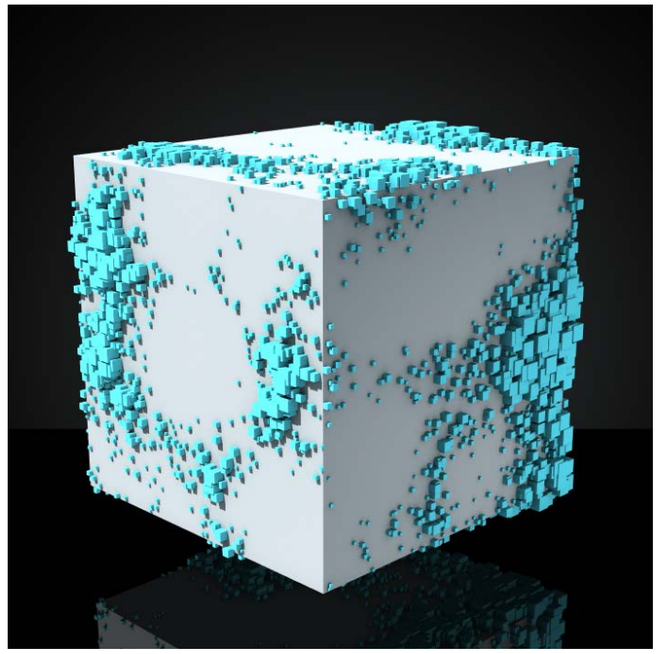
"Perlin" 3D noise distribution.

4.6.9 Scale

Adjust the size of the noise separately in each of the X, Y and Z axes.

4.6.10 Position

Adjust the origin (essentially move the noise) in each of the X, Y and Z axes.



"Cellular" 3D noise distribution.

4.7 Density Image Map

A greyscale image (jpeg or png) may be used to drive the distribution of instances. Lighter tones represent more densely placed instances, darker tones represent sparser placement. 100% black ensures no instances are placed.

NB. Image Map controls are only available for Surface scatters.

4.7.1 Choose Map

Use this option to open a file selection dialogue to choose an image.

4.7.2 Trash Button

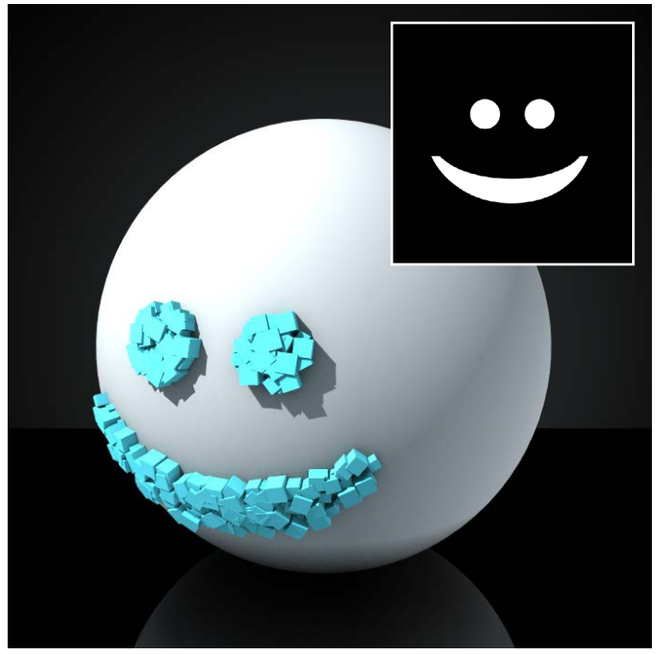
Click this button to remove the current Density Image Map.

4.7.3 Projection

Image maps by default use a simple planar projection onto the Target object and the axis can be set using this option. Alternatively the Target object's UV map can be used.

4.7.4 Invert

Check this option to invert (make negative) the Density Image Map.



Use a Density Image Map to control the distribution of instances.

4.8 Affinity

The affinity options control how the placement of instances is affected by other objects in the scene. This is especially useful for situations such as placing fallen leaves only under trees for example. (NB. The affinity distances are calculated from object origin points and not their mesh)

4.8.1 Object/Group

Select the object/group/scatter group that the instances will have affinity to. A single object, a group of objects or an UltraScatter group of instances can be used.

4.8.2 *Attract*

Instances are attracted to the Affinity objects. This setting controls the maximum distance away from the Affinity objects that instances will be placed.

4.8.3 *Attract Falloff*

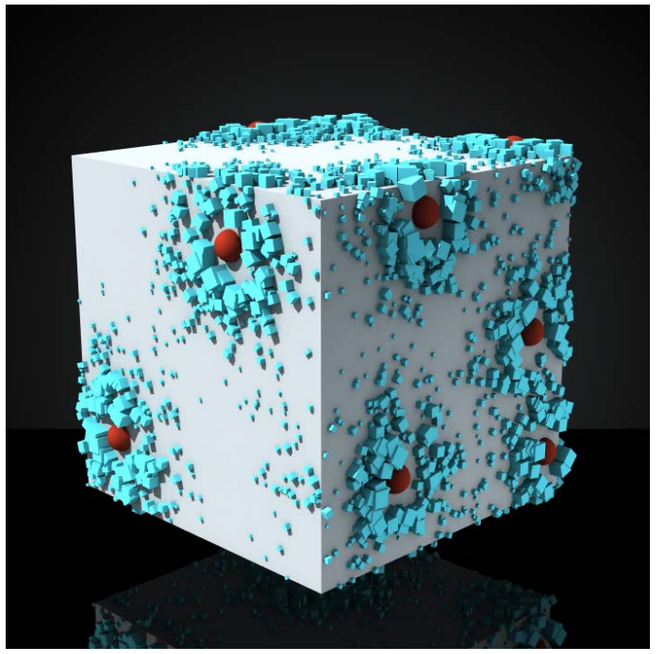
This setting controls the size of the falloff of the Attract affinity – instances will be placed more sparsely closer to the edge of the Attract affinity distance.

4.8.4 *Repel*

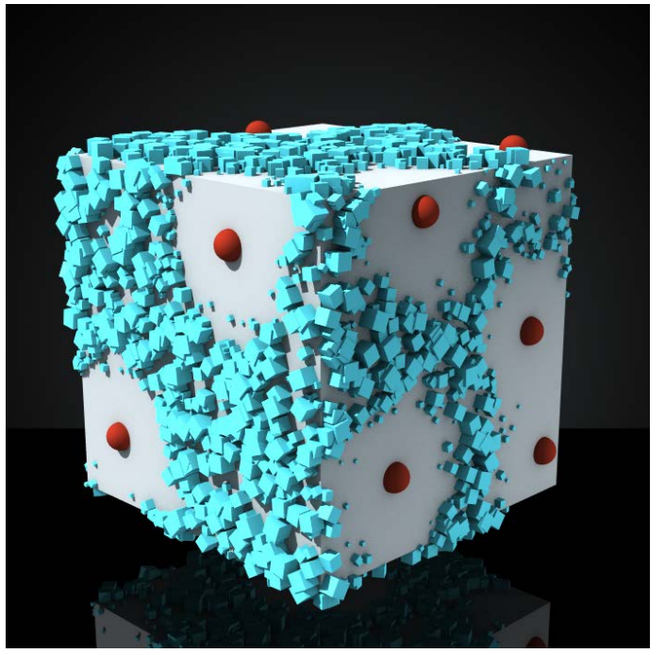
Instances are repelled away from the Affinity objects. This setting controls the radius around Affinity objects that instances will not be placed.

4.8.5 *Repel Falloff*

This setting controls the size of the falloff of the Repel affinity – instances will be placed more sparsely the closer they are to the edge of the Repel ffinity distance.



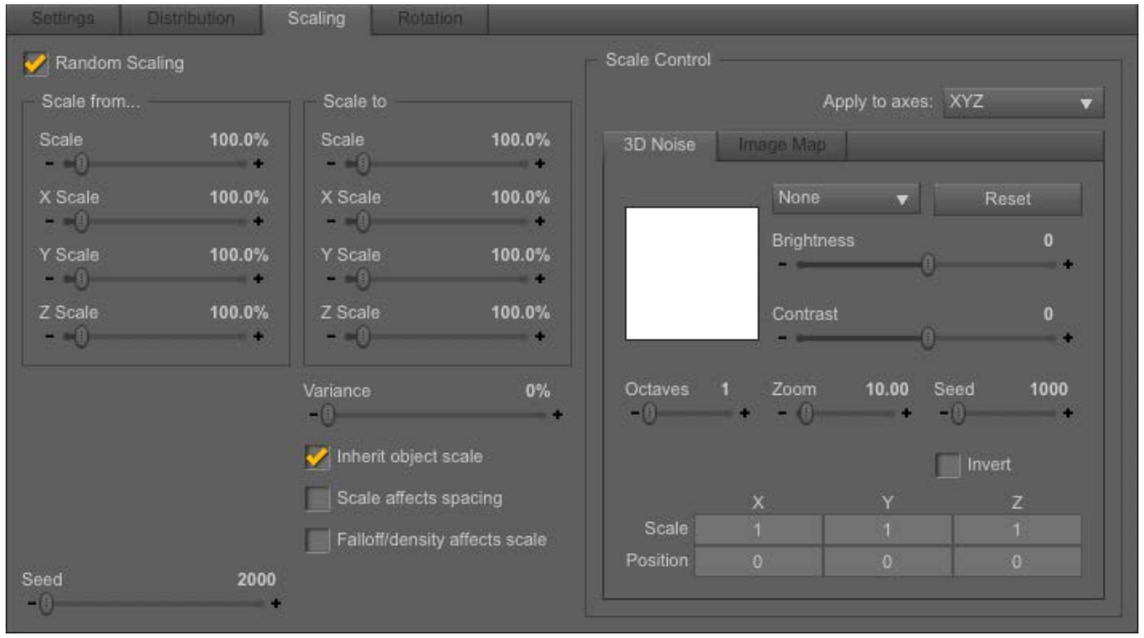
Use an Attract affinity to group instances around other objects.



Use a Repel affinity to push instances away from other objects.

5 Scaling Panel

The settings on this panel control the size and scale of the instances. Some settings are only applicable to Surface Scatters and therefore will be hidden when using Volume or Matrix scatters.



5.1 Random Scaling

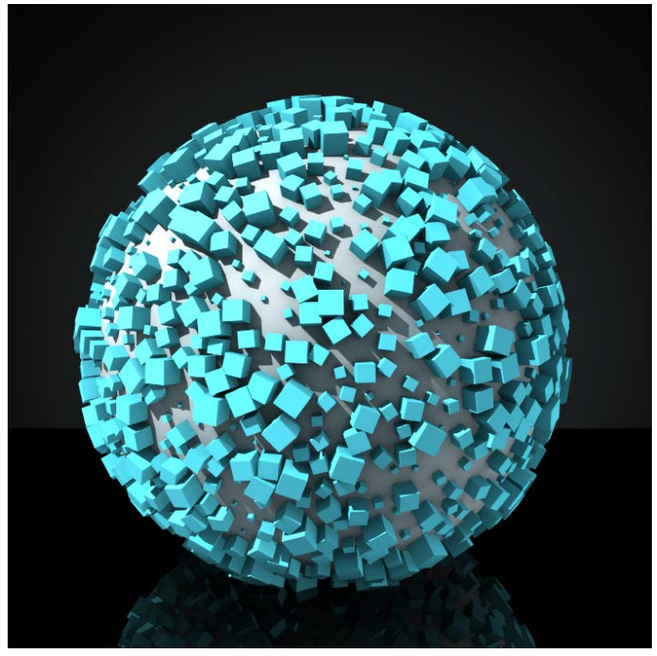
If checked and no 3D Noise and no Scale Image Map is used then instances will be created with scaling randomly chosen between Scale From and Scale To. If unchecked then all instances will be scaled to the Scale To setting.

5.2 Scale from

This setting determines the Scale From setting applied to an instance. 100% represents no change to scaling. If 3D Noise or a Scale Image Map is used then areas represented with black will produce instances at the Scale From setting, 50% grey will produce scaling half way between Scale From and Scale To.

There are 4 sliders available - the Scale slider sets the global scale of the instance while the X Scale, Y Scale and Z Scale separately adjust the instance scale on each of the axes.

Min Scale settings from older UltraScatters will be remapped to this setting.



Randomly scaled instances.

5.3 Scale to

This setting determines the Scale To scaling applied to an instance. 100% represents no change to scaling. If 3D Noise or a Scale Image Map is used then areas represented with white will produce instances at the Scale To setting, 50% grey will produce scaling half way between Scale From and Scale To.

There are 4 sliders available - the Scale slider sets the global scale of the instance while the X Scale, Y Scale and Z Scale separately adjust the instance scale on each of the axes.

Max Scale settings from older UltraScatters will be remapped to this setting.

5.4 Variance

This setting adds an additional amount of randomness to the scaling of instances. 0% has no effect while 100% will randomly scale the instances between one half (50%) and double (200%) its original size.

5.5 Inherit object scale

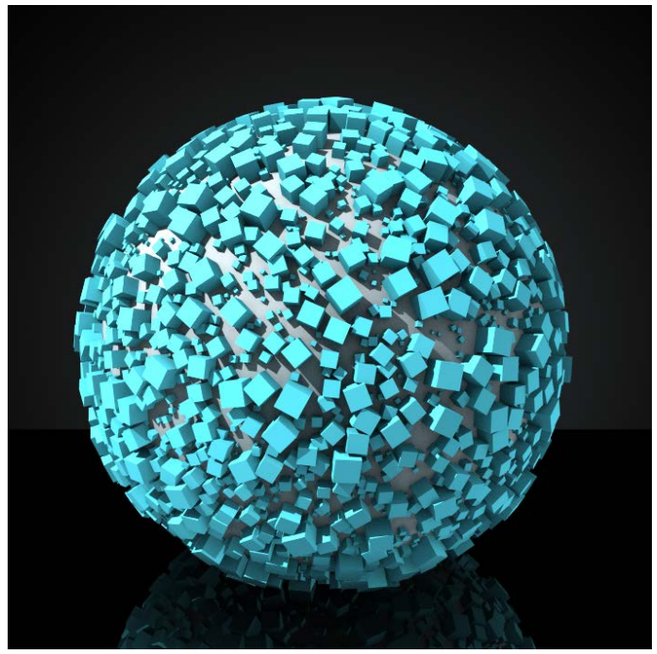
This option will ensure that any scaling already applied to the scatter object will be also be applied to each instance before all other scaling options are calculated. This setting does preserve values in the indivudal X, Y and Z scale settings of the object.

5.6 Scale affects spacing

This option allows for the minimum distance between instances to adjust along with the instance scaling. For example if an instance is scaled 50% and the Spacing is set to 50cm then this instance will be permitted to be within 25cm (50% of 50cm) of another instance.

5.7 Falloff/density affects scale

If this option is selected then anywhere a density or falloff is in effect the instances will also be scaled. As a result this setting only has some effect when the Scale From and Scale To settings have been set to different values and any of the falloffs for slope, elevation, orientation, and affinity are being used.



The distance between instances reduces in relation to their scale when Falloff/density affects scale is selected.

5.8 Seed

UltraScatter uses seeded randomising when calculating instance distribution, scaling, and rotation. This setting applies to instance scaling. This means that if no settings are changed on the Scaling pane then all the instances will appear with the same scaling every time the Scatter Button is clicked so long as the seed number has not changed.

Drag the slider to change the seed to a different number – or alternately type in a number.

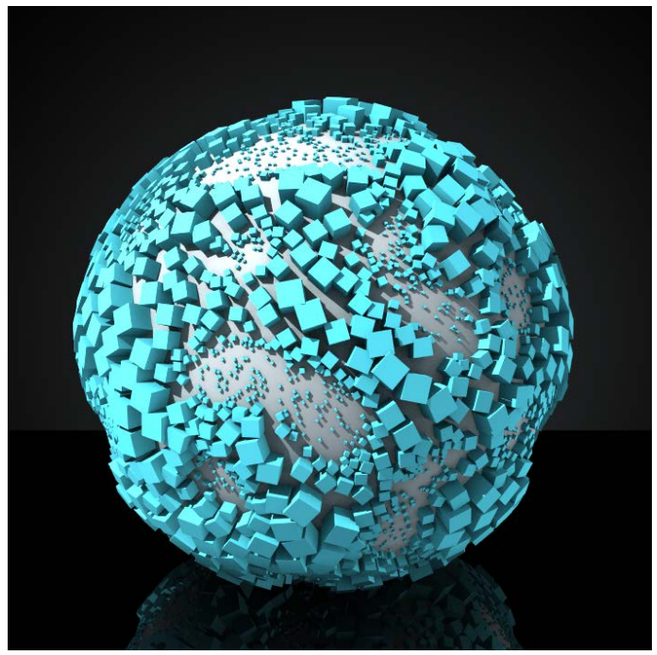
5.9 Scale Control

5.9.1 Apply to axes

This setting determines which of the instances' axes are affected by the Scale 3D Noise or Scale Image Map

5.10 Scale 3D Noise

UltraScatterPro allows the use of procedural 3D noise to determine the density or spacing of instances. See the chapter 7.2 Concepts - 3D Noise for further explaination of 3D Noise within UltraScatterPro



Simplex 3D noise used to drive instance scale.

5.10.1 Noise Type

Select the type of 3D noise to use, options are:

- None,
- Simplex,
- Perlin, and
- Cellular

5.10.2 Reset Button

Reset all Scale Noise setting to their default values.

5.10.3 Brightness

Adjust the brightness of the Scale 3D Noise.

5.10.4 Contrast

Adjust the contrast of the Scale 3D Noise.

5.10.5 Octaves

The number of octaves controls the amount of detail in noise. Higher numbers increases the detail in the noise, with the added drawback of increasing the calculation time.

5.10.6 Zoom

The zoom adjusts the size of the noise equally in X, Y and Z axes.

5.10.7 Seed

Change the seed setting to randomize the noise.

5.10.8 Invert

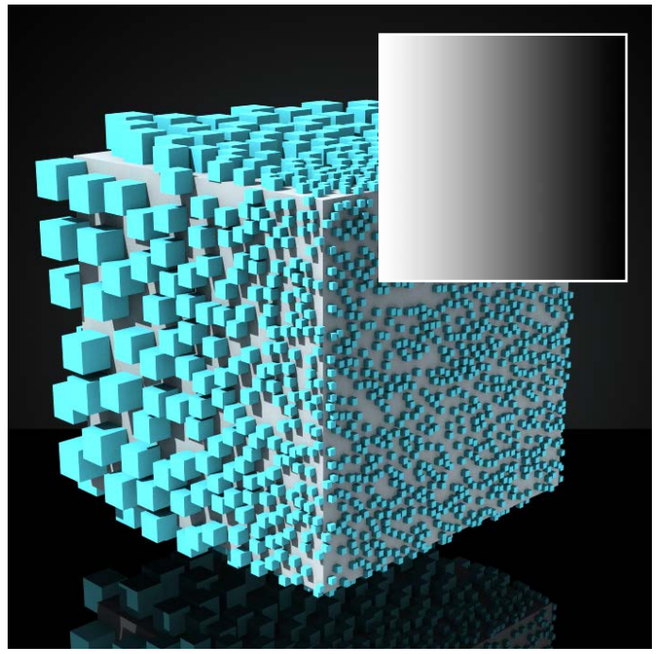
Check this option to invert (make negative) the Scale 3D Noise.

5.10.9 Scale

Adjust the size of the noise separately in each of the X, Y and Z axes.

5.10.10 Position

Adjust the origin (essentially move the noise) in each of the X, Y and Z axes.



Use a Scale Image Map to drive instance scaling.

5.11 Scale Image Map

A greyscale image (jpeg or png) may be drive the scaling of instances. White pixels result in instances created at the 5.3 Scale to scale, black pixels result in instances created at the 5.2 Scale from scale, while greys results in proportional scaling between the two settings.

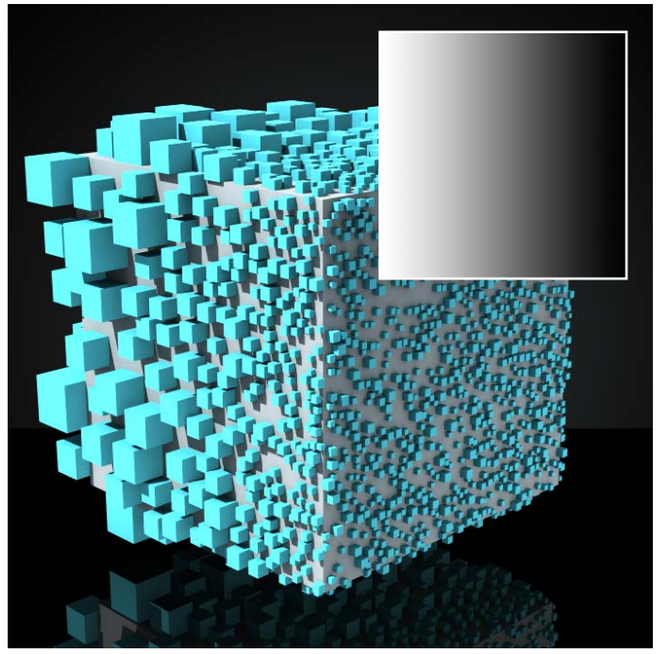
NB. Image Map controls are only available for Surface scatters.

5.11.1 Choose Map

Use this option to open a file selection dialogue to choose an image.

5.11.2 Trash Button

Click this button to remove the current Scale Image Map.



An example of Variance being used to add random variation to the instances when using a Scale Image Map.

5.11.3 Projection

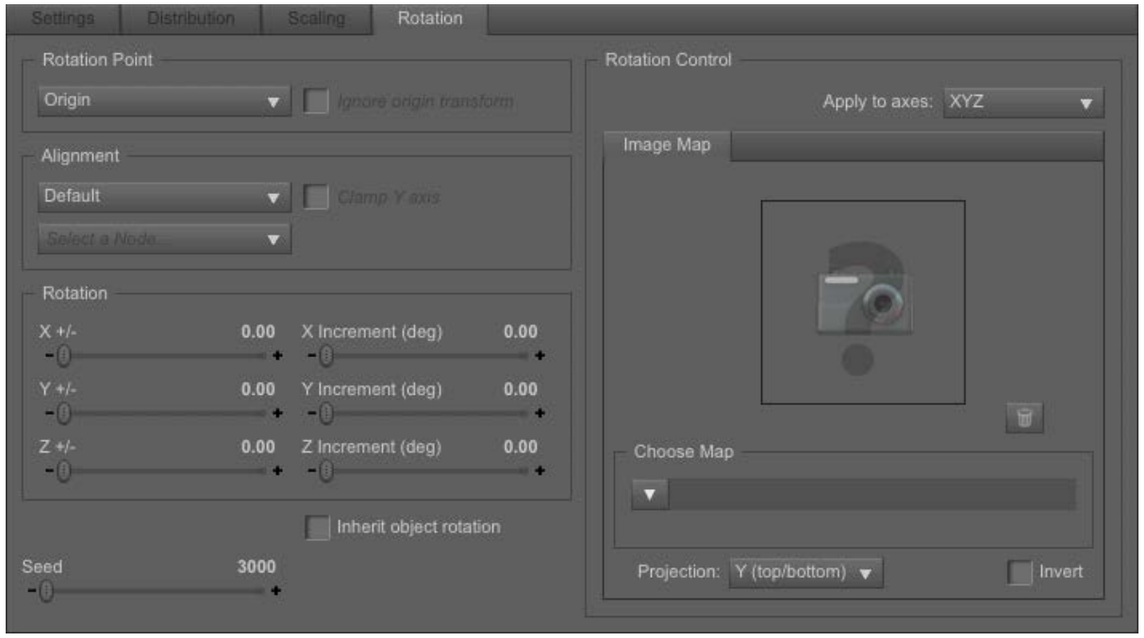
Image maps by default use a simple planar projection onto the Target object and the axis can be set using this option. Alternatively the Target object's UV map can be used.

5.11.4 Invert

Check this option to invert (make negative) the Scale Image Map.

6 Rotation Panel

The settings on this panel control the alignment and rotation of the instances. Some settings are only applicable to Surface Scatters and therefore will be hidden when using Volume or Matrix scatters.

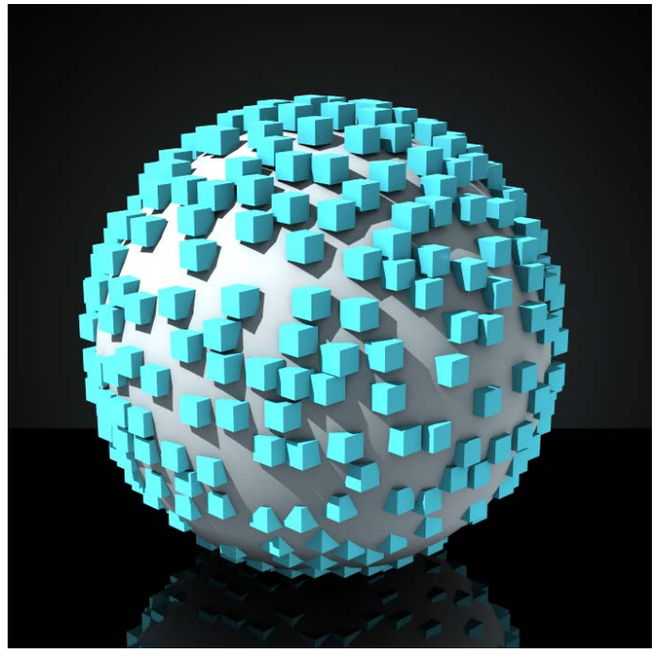


6.1 Rotation Point

The options here are used to determine the point around which each instance is rotated and scaled.

- Origin – use the existing origin point of the scatter object
- Top – use the top-centre of the instance's bounding box
- Center – use the centre of the instance's bounding box
- Bottom – use the bottom-centre of the instance's bounding box

This setting can also be used to help correct the origin or pivot point of the scatter object if it appears to be floating or otherwise not on the surface of the target object after being scattered.



Align: Default - instances have no rotation applied.

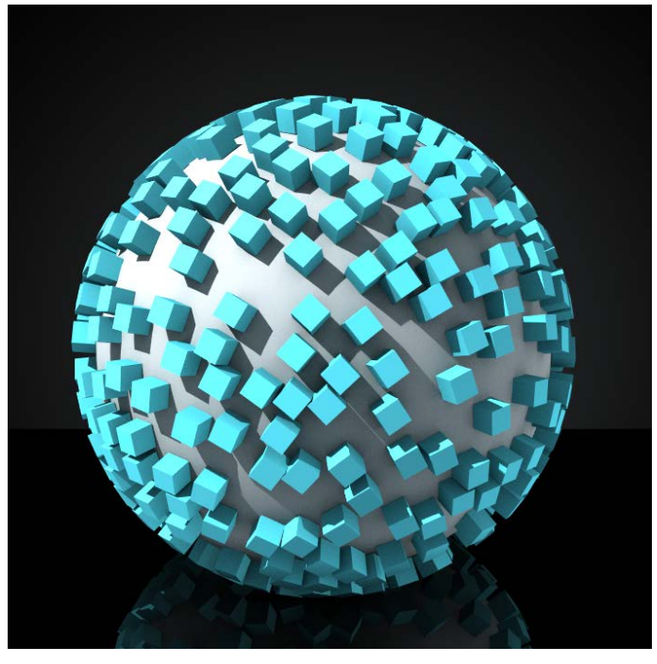
6.2 Ignore origin transforms

This setting will tell the script to ingore any tranforms that have been applied to the scatter object's origin point. If instances are not being correctly placed upon

the surface of the target after scattering the cause could be that the origin point has been moved (tranformed).

An example of when this might be needed is when a figure has the default origin point at the figure's feet but the origin point was been moved to the chest. Scattering with this option deselected would result in the scattered instances being buried up to the chest.

This option is disabled unless the rotation point is set to 'origin' and the object to be scattered has had its origin transformed.



Align: Surface Normal - instances are rotated to the surface normal of the target object.

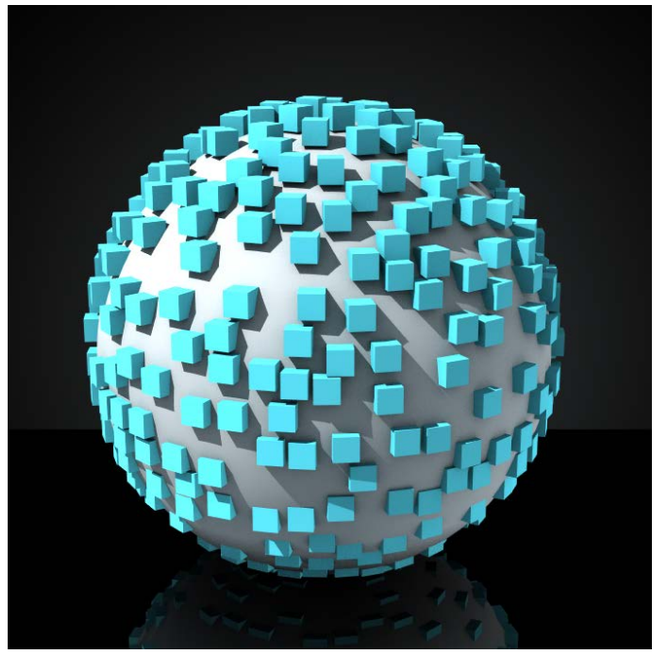
6.3 Alignment

This option enables setting an initial rotation for each instance, applied before any other rotation options are processed.

- Default: The instances do not have any initial rotation applied.
- Point at...: The instances will each use Daz Studio's "Point At" parameter. Select a node in the scene as a Point At target. Using this option will disable the Rotation Image Map settings.
- Surface Normal: This option will ensure that scattered instances are rotated to align to the surface normal of the Target object. Only applies to Surface Scatters.

6.4 Clamp Y axis

When using "Point at..." alignment checking this option will ensure the instances are only rotated on the Y axis - useful for making a figure face towards an object without introducing unwanted tilt.



Align: Surface Normal with Clamp Y checked - instances are rotated to the surface normal of the target object but are only rotated on the Y axis.

6.5 Rotation

6.5.1 X Rotation +/-

This setting determines the amount of rotation on the x axis that is applied to scattered instances. Each instance will be randomly rotated by a number between plus or minus this setting. This setting will be ignored if using a Rotation Map.

6.5.2 X Increment (deg)

Setting an increment value will ensure the instances are only rotated on the x axis by an amount that is a multiple of this setting. For example a setting of 90 deg will limit the rotation to -180, -90, 0, +90, +180 deg.

6.5.3 Y Rotation +/-

This setting determines the amount of rotation on the y axis that is applied to scattered instances. Each instance will be randomly rotated by a number between plus or minus this setting. This setting will be ignored if using a Rotation Map.

6.5.4 Y Increment (deg)

Setting an increment value will ensure the instances are only rotated on the y axis by an amount that is a multiple of this setting. For example a setting of 90 deg will limit the rotation to -180, -90, 0, +90, +180 deg.

6.5.5 Z Rotation +/-

This setting determines the amount of rotation on the z axis that is applied to scattered instances. Each instance will be randomly rotated by a number between plus or minus this setting. This setting will be ignored if using a Rotation Map.

6.5.6 Z Increment (deg)

Setting an increment value will ensure the instances are only rotated on the z axis by an amount that is a multiple of this setting. For example a setting of 90 deg will limit the rotation to -180, -90, 0, +90, +180 deg.

6.6 Inherit object rotation

This option will ensure that any rotations already applied to the scatter object will be retained.

6.7 Seed

UltraScatter uses seeded randomising when calculating instance distribution, scaling, and rotation. This setting applies to instance rotation. This means that if no settings are changed on the Rotation pane then all the instances will appear with the same rotation every time the Scatter Button is clicked so long as the seed number has not changed.

Drag the slider to change the seed to a different number – or alternately type in a number.

6.8 Rotation Control

6.8.1 Apply to axes

This setting determines which axes the Rotation Image Map applies to. For example human figures may only need to be rotated on the y axis so that is the setting that would be chosen here.

6.9 Rotation Image Map

A greyscale image (jpeg or png) to drive the rotation of instances. White pixels result in instances rotated +180 degrees, black pixels result in instances rotated -180 degrees while greys result in proportional rotation between those values. 50% grey applys no rotation.

Any values entered into 6.5.1 X Rotation, 6.5.3 Y Rotation, or 6.5.5 Z Rotation inputs will still be applied after the image map rotation has been processed. Rotation image maps are not applicable when 6.3 Alignment is set to “Point at...”.

NB. Image Map controls are only available for Surface scatters.

6.9.1 Choose Map

Use this option to open a file selection dialogue to choose an image.

6.9.2 Trash Button

Click this button to remove the current Rotation Image Map.

6.9.3 Projection

Image maps by default use a simple planar projection onto the Target object and the axis can be set using this option. Alternatively the Target object’s UV map can be used.

6.9.4 Invert

Check this option to invert (make negative) the Rotation Image Map.

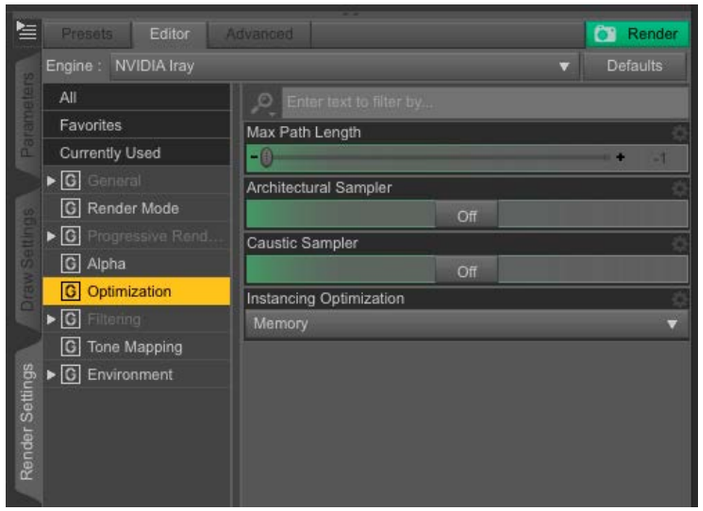
7 Concepts

7.1 Iray Rendering

The Iray render engine has an optimization option that it is very important to be aware of. It is called ‘Instancing Optimization’ and can be set to one of two settings: ‘Speed’ or ‘Memory’. When rendering a large number of instances ensure that this option is set to ‘Memory’.

The ‘Speed’ setting instructs the renderer to load every instance as full geometry into memory at render time. This can potentially speed up a render containing only a few instances but if the instances are of complex objects or there are many thousands of instances then it is easy to overwhelm the system and cause a crash.

The ‘Memory’ setting ensures that each object that is instanced is loaded into memory only once - allowing the use of many, many instances or complex objects whilst maintaining a small memory footprint.

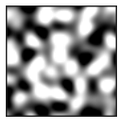


Ensure ‘Instancing Optimization’ is set to ‘Memory’ when rendering large numbers of instances

7.2 3D Noise

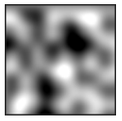
Procedural noise functions are widely used in Computer Graphics, from off-line rendering in movie production to interactive video games. The ability to add complex and intricate details at low memory and authoring cost is one of its main attractions. UltraScatterPro has implementations of three different noise functions for adjusting instance scale and density. They are Simplex, Perlin, and Cellular - described below.

7.2.1 Simplex



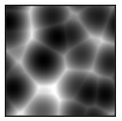
Simplex noise is a method for constructing an n-dimensional noise function comparable to Perlin noise but with fewer directional artifacts and, in higher dimensions, a lower computational overhead.

7.2.2 Perlin



Perlin noise is a type of gradient noise developed by Ken Perlin in 1983 as a result of his frustration with the “machine-like” look of computer graphics at the time.

7.2.3 Cellular



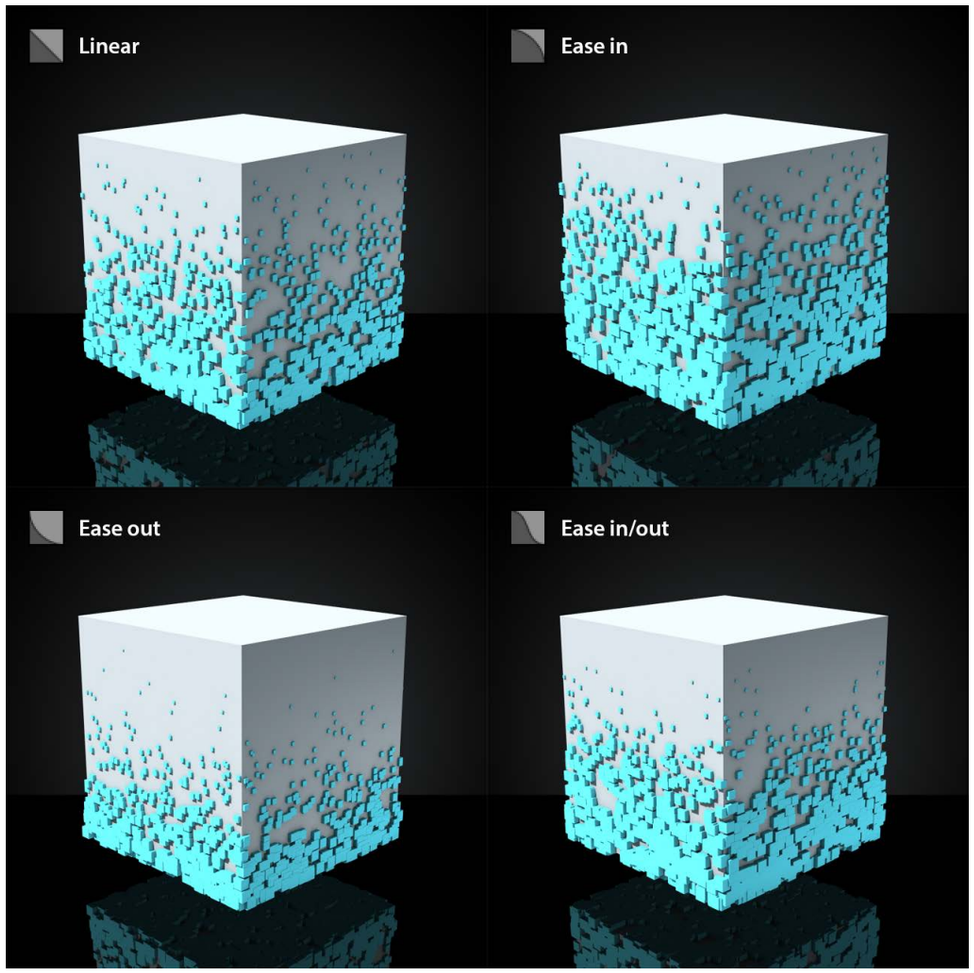
Also known as Worley Noise or occasionally Voronoi Noise, this is a texture built by computing the distance to randomly distributed points, and weighting the lightness of each pixel by the distance from the closest points.

7.3 Falloff Curves

Falloff curves affect the rate of change in the scale or density of instances across the length of the falloff. The curve can be set separately for each falloff option. There are four curves to choose from:

1. Linear,
2. Ease in,
3. Ease out, and
4. Ease in/out.

The four options are demonstrated below.



8 Version History

1.0 Initial Release

1.0.1 Ability to change measurement units added

9 Acknowledgments

9.1 Mersennetwister copyright