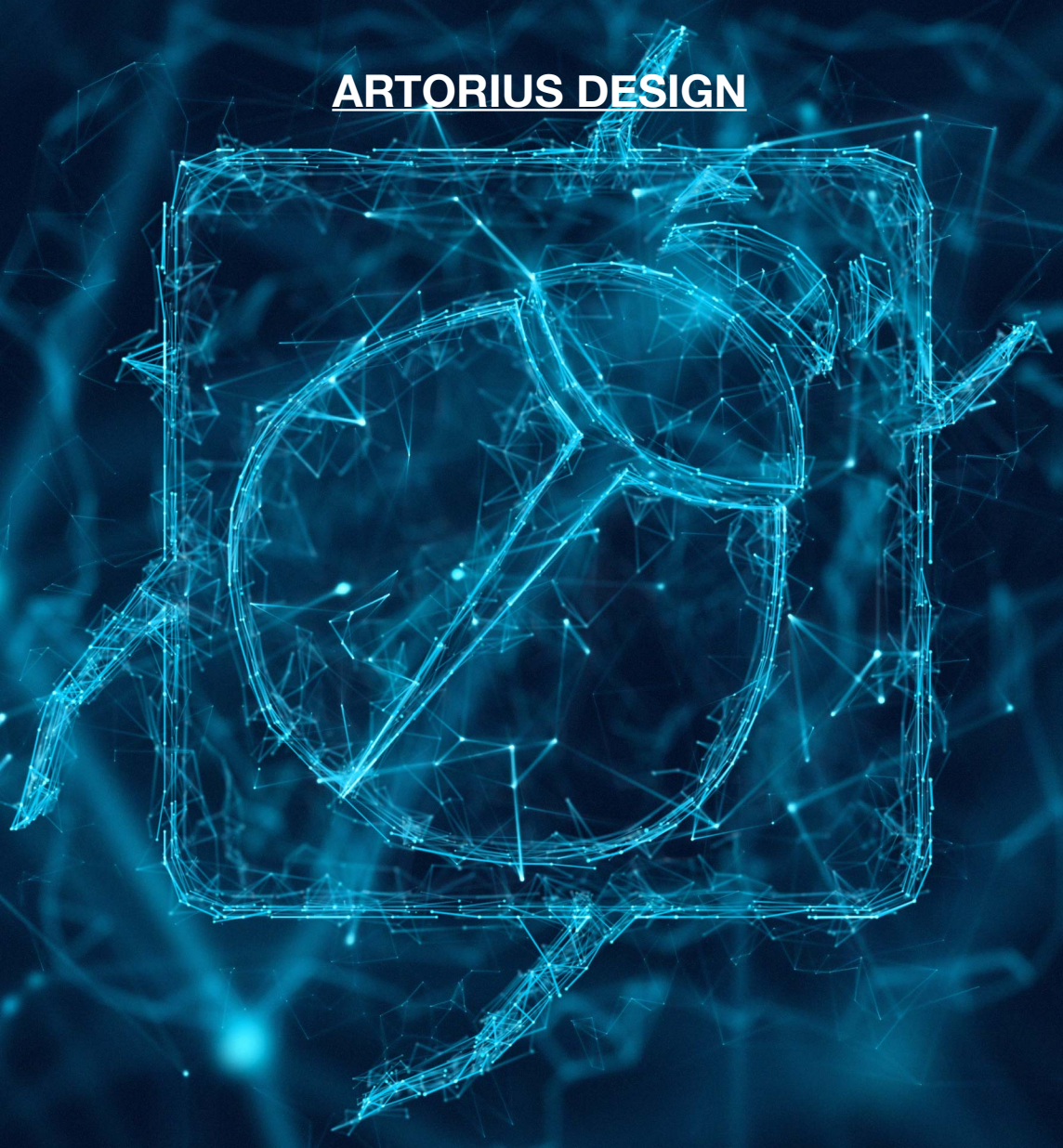


**ARTORIUS DESIGN**



# PLEXUS MAKER

A D O B E P H O T O S H O P E X T E N S I O N

## Introduction

Thank you for your interest in Plexus Maker Photoshop Extension.

Plexus Maker is an extension (a plugin) for Adobe Photoshop CC 2016+ that creates sophisticated structures of interconnected dots (so-called plexus effect). These plexuses can be based on vector shapes (paths) to take their form, according to the numerous settings available, or can be entirely randomly generated to fill backgrounds.

To create a plexus effect based on a shape, the plugin analyses the shape's configuration - number of paths, points, curvature of lines etc - and using the defined settings it can create a main and an auxiliary structure of points. Lines and triangles are then created by interconnecting the points in a specific way.

The points and lines are drawn with user-defined colours and a user-defined brush that the plugin constantly adjusts in size, opacity and hardness according to the render settings.

## Installation

After extracting the downloaded zip archive, copy the **com.artoriusdesign.plexusmaker** folder to one of the following locations:

**Mac:** /Library/Application Support/Adobe/CEP/extensions/

**Windows 64-bit, CC2017+:** C:\Program Files (x86)\Common Files\Adobe\CEP\extensions\

**Windows 32-bit, CC2017+:** C:\Program Files\Common Files\Adobe\CEP\extensions\

**Windows, CC2016:** %userprofile%\AppData\Roaming\Adobe\CEP\extensions\  
%userprofile% will default to your current User directory on Windows.

Open Photoshop again.

## Activating Plexus Maker on first use

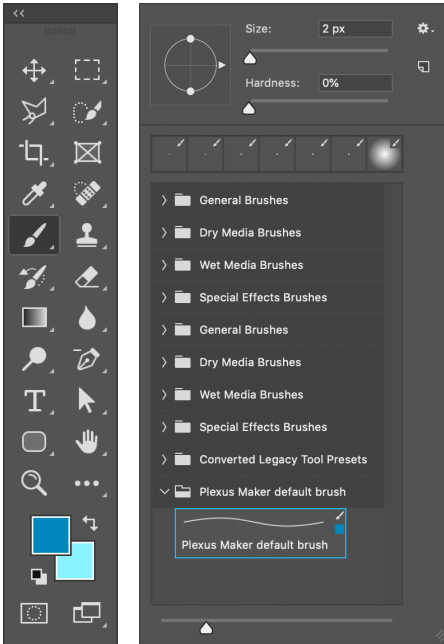
When opening the plugin for the first time (Window menu - Extensions - Plexus Maker) you will be prompted to enter the Envato purchase code that you have received when you purchased Plexus Maker.

You can easily find your purchase code following the instructions from the Envato support page [Where is my purchase code?](#) An internet connection will be required for validating the purchase code.

After activation, your purchase code will not be required anymore but an internet connection will be still needed to validate the license each time the plugin is opened. This is done in the background. No data from the machine is collected.

## Pre-requirements

### Defining the brush for drawing the plexus structure



The plugin will use the current brush from the Brush tool to draw all the lines and points. It will draw the lines with the foreground colour and the points with the background colour.

Therefore, for the correct look of the result, a simple, soft round brush should be selected and set at a sizes starting around 2px. You can select one of Photoshop's default brushes and set its size or you can use the brush that comes with the plugin (load the .abr brush file into Ps from Window menu - Brushes - Import brushes or Preset manager - Load).

In CC2019, if you import the Plexus Maker default brush into Ps and select it, the foreground colour picker will be filled with the default colour. You will need to pick the background colour (for points).

For the typical blue style results, the foreground colour needs to be a strong saturated blue and the background colour a lighter blue.

### What do we create?

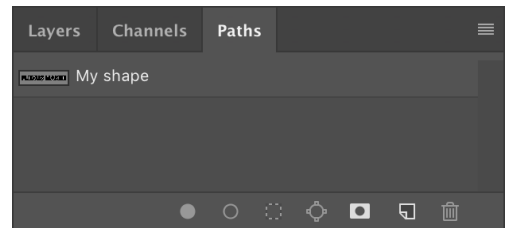
Plexus Maker works with paths. It analyses the available paths to generate a structure of points, according to the settings, that it then renders. It can also draw background plexus - randomly placed interconnected points without a shape source, but this is covered later.

The shapes you want to transform into a plexus will need to be saved as paths. These can be text, various shapes, vector logos etc.

Note: An editable text layer can be converted to a path from Type menu - Create work path; in the Paths panel double-click on the path named Work Path to save it as a normal path.

Note: A vector shape layer, while selected, will display its path in the Paths panel. Double-click on the path name to save the path, otherwise it's gone when the shape layer is not selected anymore.

If you have a Work path it is important to save it as a normal path as the work paths get deleted during the render process.



## Plexus Maker interface - settings explained

The Plexus Maker interface allows easy control of all settings. It comes with some default settings that will produce a simple result. Because we might want to retain the numerous values from input fields, sliders and checkboxes that reset to default when opening the plugin, presets can be saved and loaded - they will contain all choices and values including foreground and background colours.

Brush choice and its settings are not saved. The default file format for the Plexus Maker presets is plx.

Two types of plexus can be created, each with different settings: **Shape-based and Background**.

Shape-based type will create a plexus structure replicating the shape of an existing path, so a vector path will be required.

Background type will generate a plexus structure of various points placed in the canvas, according to the settings. It does not require a path to replicate its shape, the points will be placed randomly in the canvas.

The system of minimum and maximum values means the plugin will use a value in between each time it draws a point, line or triangle.

## SHAPE-BASED PLEXUS

### Render Settings

The render settings control the way each point, line or triangle in the plexus will be drawn (rendered).

This includes the minimum and maximum opacity of the each line and triangle drawn, the hardness of a each point and the following:

**Line opacity (%)** - minimum and maximum opacity for drawing lines that connect points.

**Line size multiplier (x)** - the brush size you set in the Brush tool settings can be multiplied by different values between the min and max when drawing each line. E.g. if the brush size is 2px, min is 1 and max is 2, lines drawn can be between 2px and 4px in thickness.

**Point size multiplier (x)** - determines how much bigger can the point be in thickness compared to the line (lines are drawn first, then points). E.g. our line above could be between 2px and 4px, so a specific line could be 3.2 pixels in thickness. The point here can be 1.2 to 1.5 thicker than that line.

**Point hardness (%)** - determines the softness/hardness of the points (more or less blurry).

**Triangle opacity (%)** - points will be rendered with various opacity settings between min. and max.

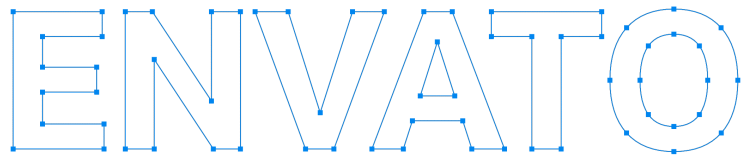
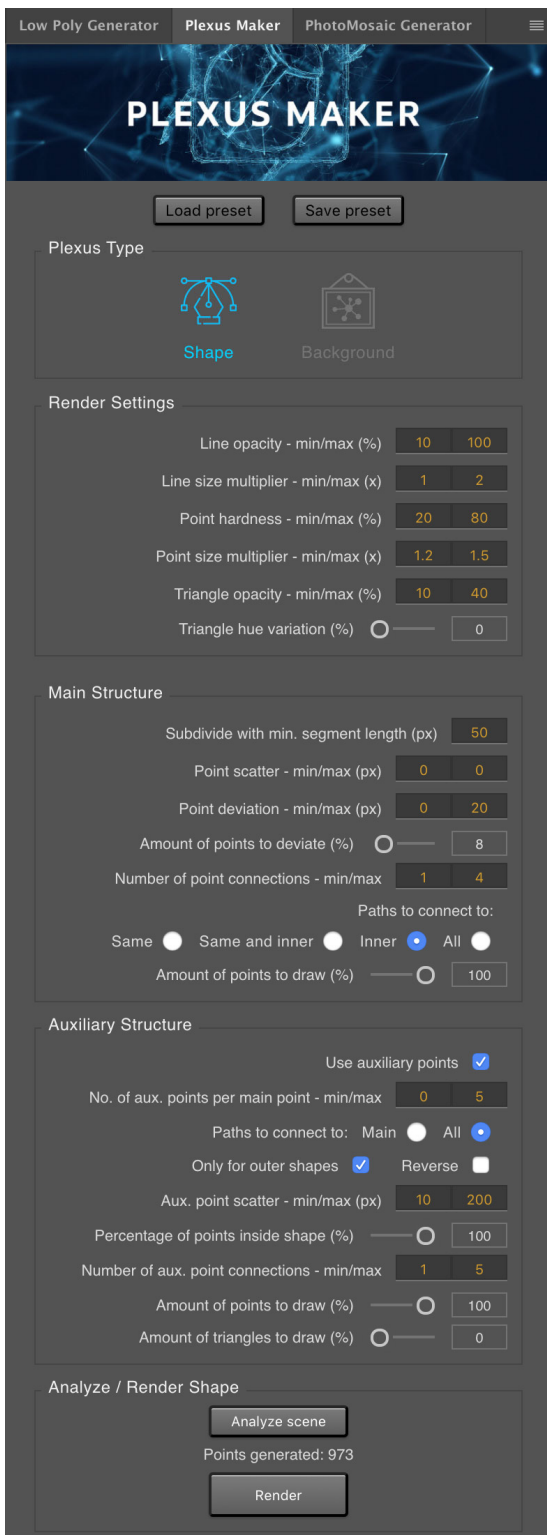
**Triangle hue variation (%)** - implements a colour hue variation based on the foreground colour chosen to render the triangles.

### Main Structure

The Main structure is responsible for generating the plexus points that are following more or less the contour of the desired shape. It takes into consideration the number of points the path has.

**Subdivide with min. segment length (px)** - this is an important setting as it controls the number of points generated on a shape's contour where normally there would be only a few points in the path.

Each segment of the path (line between two points) can be subdivided to create additional points.



E.g. if a path segment (might be curved) has a length of 100px and the setting is 50px, one point will be created at the middle of this segment so the rendered plexus will display 3 points in that area.

A lower value will subdivide a path segment into multiple segments by creating points in between. Min. value is 10px.

**Point scatter (px)** - the points that are collected from the path and those that are generated on the path's contour (subdivisions) can be scattered with random values between min. and max. This will distort the appearance of the plexus, making it resemble the original path less.

E.g. if we input a min of 0 and max of 10 the plugin will reposition each point with offsets between 0 and 10 px either to the left, right, up or down off its standard position, or combined.

**Point deviation (px)** - similar to the scatter but a deviated point will not be connected back to a normal point. A normal point connects through a line to a deviated point, but the line will not be continuing from that point to the next point, it will remain hanging.

**Amount of points to deviate (%)** - determines how many points will be deviated - breaking up the uninterrupted structure of lines.

**Number of point connections** - makes each point from the main structure connect to more than one other point from the main structure.

**Paths to connect to** - if the maximum number of point connection is higher than 1, points from each path can be connected, based on closeness, to points from the same path, same and inner paths, inner paths only or all existing paths.

**Amount of points to draw (%)** - controls how many of the points generated with the settings above will actually be drawn. Setting this to less than 100% will produce gaps in the contour of the rendered plexus.

**Amount of triangles to draw (%)** - controls how many triangles will be created by connecting 3 close points. These points can come either from the main structure or from the auxiliary structure.

## Auxiliary Structure

If the use of auxiliary points is enabled, for each point existing in the main structure, additional (auxiliary) points can be created, according to the settings, and placed either inside or outside the shape. These points can interconnect and are responsible for most of the overall “plexus” look.

**No. of aux. points per main point** - how many auxiliary points can be created from each point (between min and max).

**Paths to connect to** - auxiliary points will be connected, based on closeness, between them and points from each main path or between them and points from all path.

**Only for outer shapes** - auxiliary structures will be generated only for the outer shapes (paths). Normally, for each existing path, an auxiliary structure of points will be created. This setting ignores paths inside other paths. E.g points will be generated around the outer path of the “O” letter, not the inner.

**Reverse** - if enabled together with previous setting, auxiliary structures will be generated only around paths found inside other paths. E.g only around the hole of “O” letter.

**Aux. point scatter (px)** - how distanced can the auxiliary point be from the main point of reference (between min and max).

**Percentage of points inside shape (%)** - normally (at 100%/default) all auxiliary points will be placed inside the shape. Lowering this value will result in auxiliary points also being placed outside the shape.

**No. of aux. point connections** - this setting is responsible for the complexity of the plexus structure. It allows auxiliary points to connect through lines with other close points, either auxiliary or main.

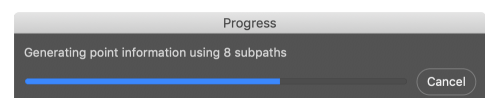
**Amount of points to draw (%)** - controls how many of the auxiliary points generated with the settings above will actually be drawn.

The use of minimum and maximum values allows either precise results or randomness and irregular results that are unique every time.

## Analyze / Render

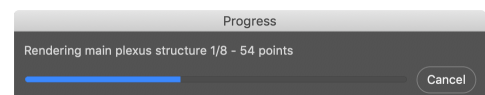
### Analyze scene button

With the chosen settings, the scene (existing paths) can be analysed to gather the points that will be later rendered. A progress bar is briefly shown as the process usually takes less than 1 second. Number of points obtained is displayed in the plugin panel.



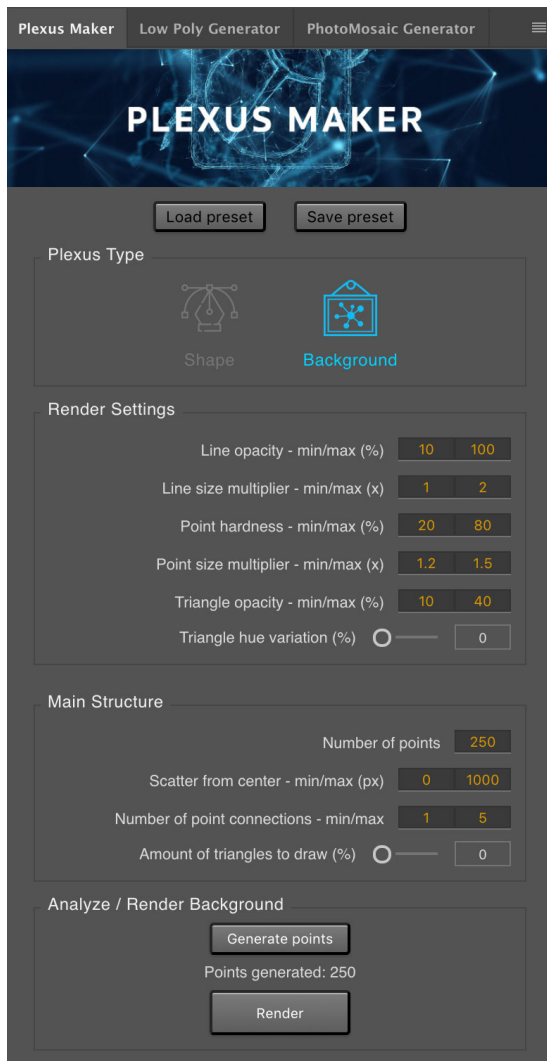
### Render button

After the scene has been analysed (points identified), the Render buttons appears.



Pressing the Render button will start the render (drawing) process. A new layer will be created and the entire plexus will be drawn using the chosen brush and colours (foreground/background). A progress bar will be shown.

Note: the analyze/render progress bars here show there are 8 subpaths, although the text “ENVATO” is composed of 6 letters. This is because A and O are each made of two combined paths (merged - outer and inner). In the case of these letters, plexus points will also be drawn on the inner holes of the letters.



## BACKGROUND PLEXUS

This type of plexus is composed of interconnected points which are randomly scattered.

## Render Settings

Please refer to the [Shape-based plexus](#) for information on the Render settings. These settings are shared between the two types of plexus that can be created.

## Main Structure

**Number of points** - the total number of points that will be created.

**Scatter from center (px)** - points will be distributed randomly from the center of the canvas towards the edges. Using a high min. value there will be no points in the center of the canvas. Points will stay inside the canvas even if the max. value is very high.

**Number of point connections** - specifies the number of other points that can be connected to each point. Points are connected to other points which are close by.

**Amount of triangles to draw (%)** - increase to draw triangles from the generated points.

## Photorealism

Photorealism - depth of field and a 3D look to the plexus shapes can be simulated in several ways. Instead of just having flat lines and points we can have them appear to be placed in a 3D environment where structures farther away from the focus area appear gradually blurry.

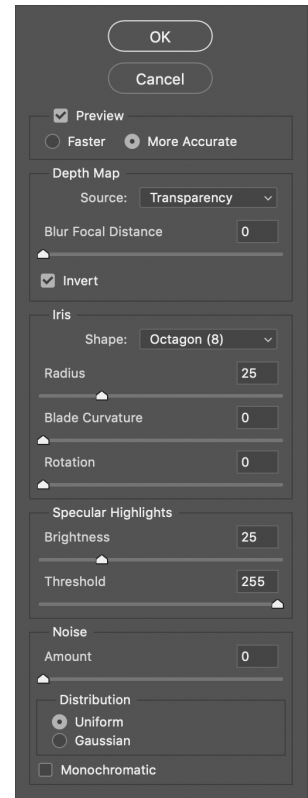
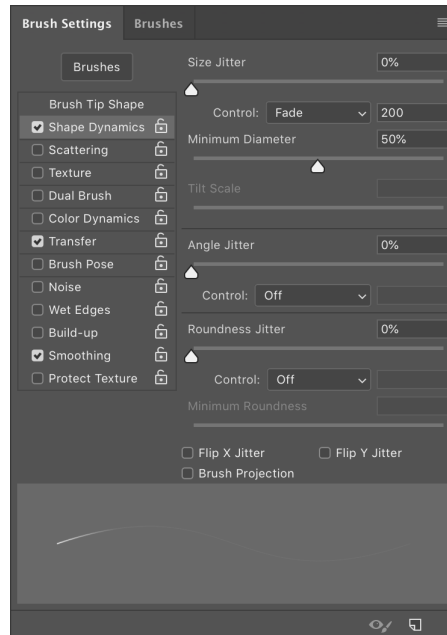
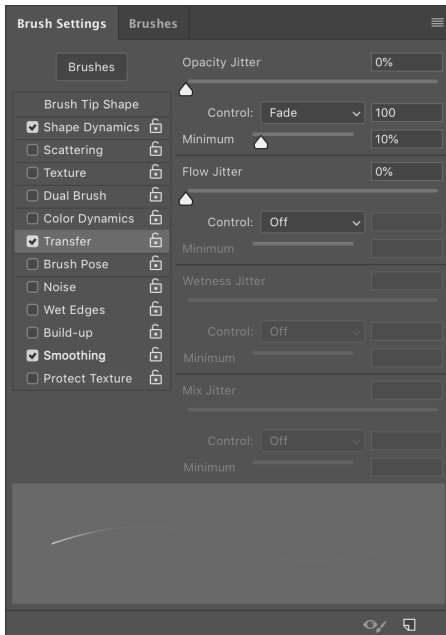
### Depth of field

Camera depth of field (blurriness in front or behind the focus area) can be simulated through the following technique:

- 1. Fading out the lines** - before rendering, on the Brush settings, activate Transfer and Shape Dynamics. We want to fade out the brush stroke when it goes from one point to the other. Use the

images here for reference. You might want to adjust the Fade value (determines how quickly the line will fade out - should be set to a value to match approx. the length of the lines). At least Transfer should be on.

**2. Lens blur** - after a render has been produced with lines that fade out, a Lens blur effect can be applied (Filter menu - Blur - Lens blur). Lens blur filter (using settings from the 3rd image) will create a depth of field effect based on transparency of the points, lines and triangles. Radius value is relevant here.



## 3D objects

A plexus shape can be made to look 3D (e.g. "ENVATO" text from the preview image). This can be done with the following technique:

**1. Render the same shape multiple times with different settings** - this will create several overlaid layers. Use the brush settings above for adding depth of field later. Be sure to press the Analyze scene button before rendering again - this will generate a new plexus configuration using the new settings.

**2. Scale down each layer progressively** - front layer should be 100% in size, other layers should go down in size around 2% related to the previous.

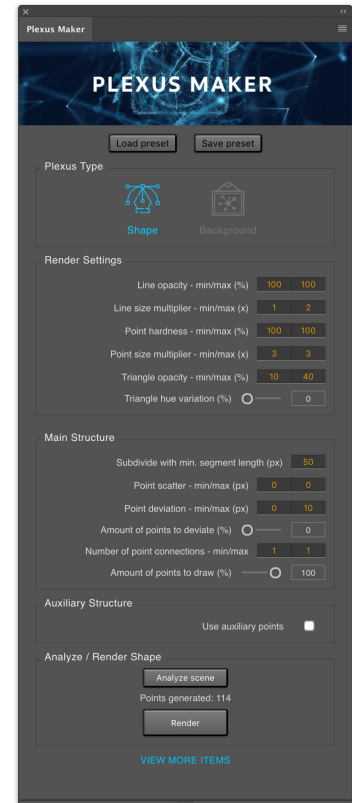
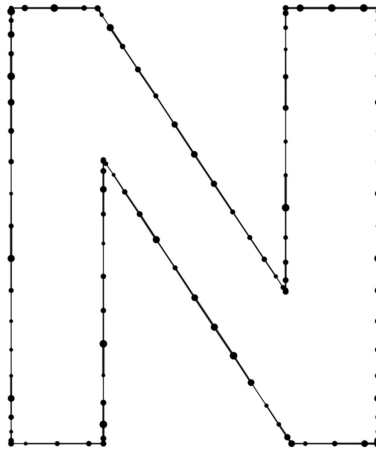
**3. Apply a Lens blur effect** - similar to above, then apply a small Gaussian blur to the layers in the back. Alternatively, a Lens blur can be added with the Source set to none to simulate a totally out of focus plexus.



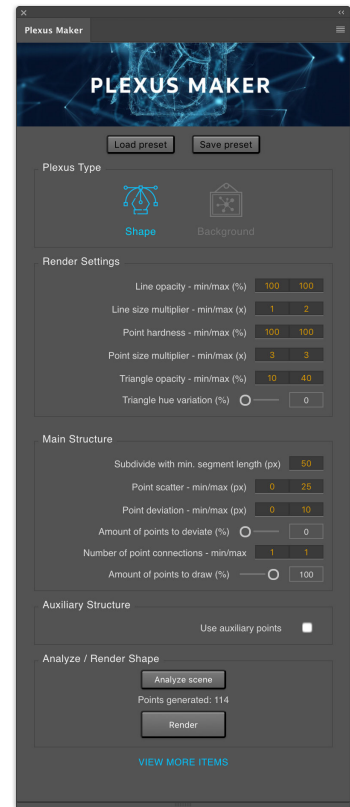
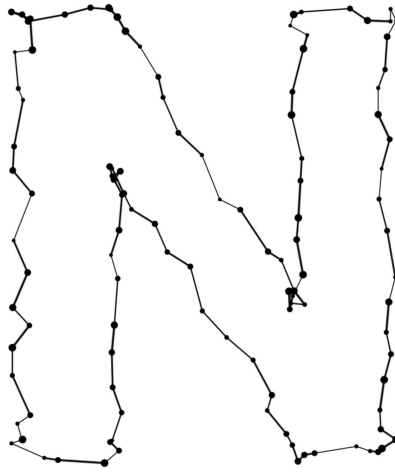
## Examples

The following images exemplify how some of the available settings affect the result. A typed “N” letter was transformed into a path and used here. The last example uses settings that are part of the newer version of Plexus Maker. They are shown in the panel.s

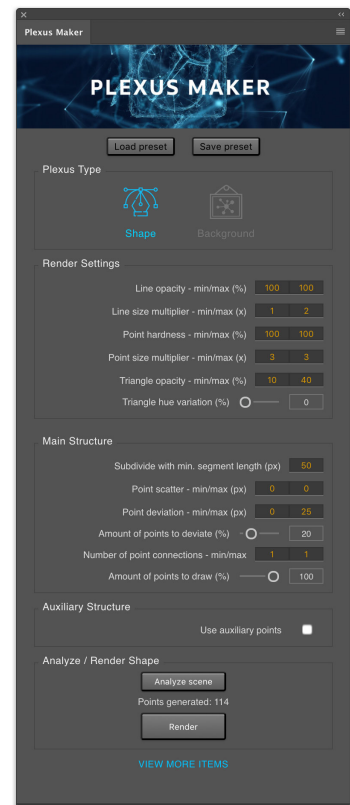
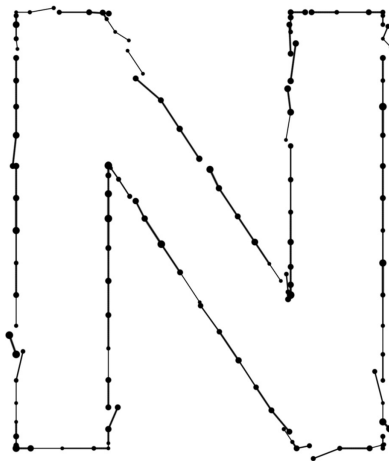
Standard settings mostly. Points are created on the contour of the “N” letter based on the “Subdivide” setting.



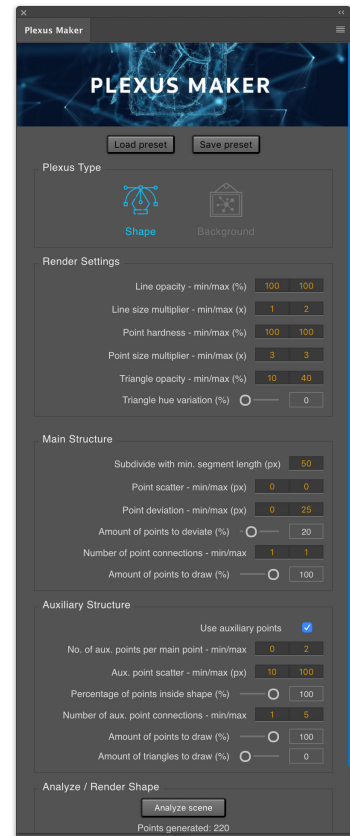
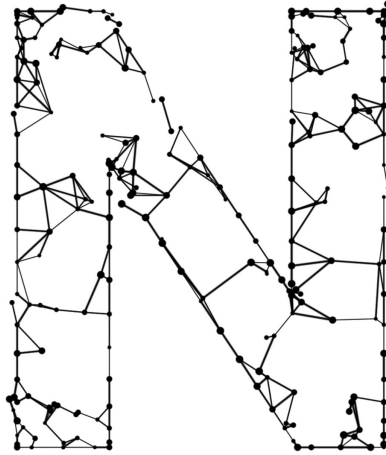
Scatter has been added. Shape structure is distorted but it does not break.



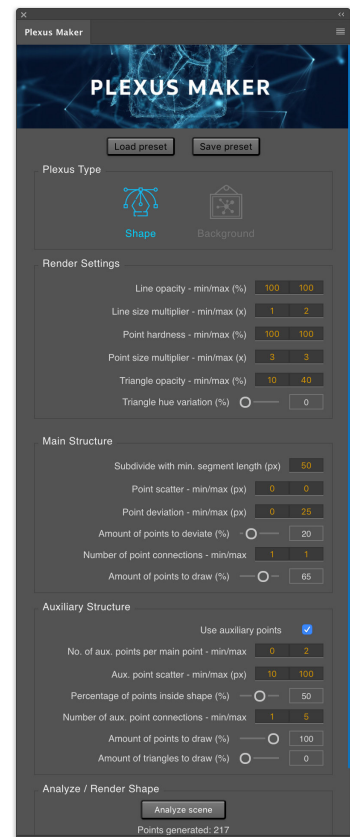
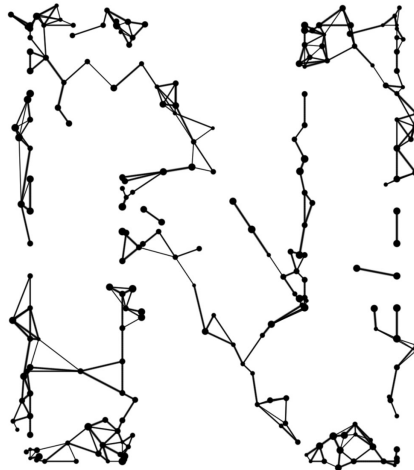
No scatter but a point deviation of 25px (max) is affecting up to 20% of the points.



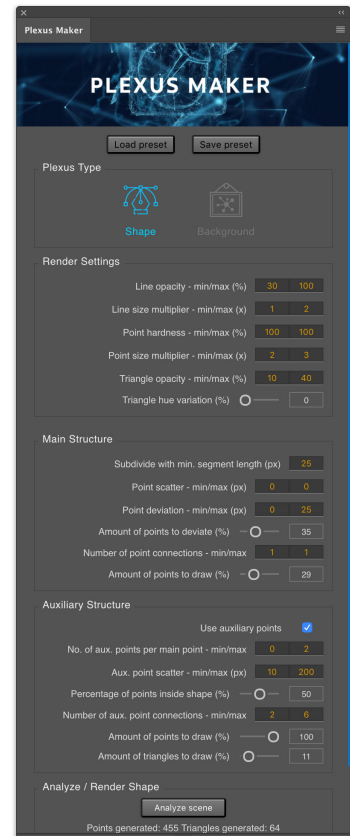
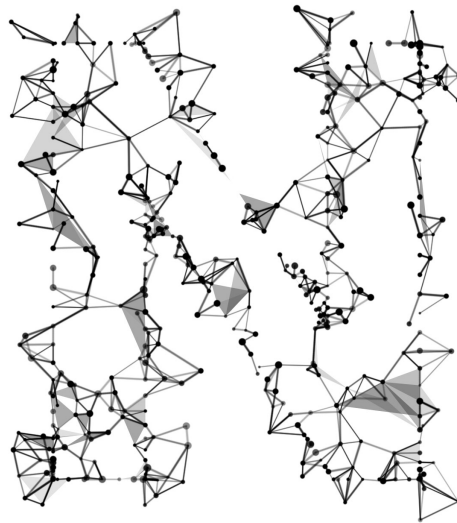
Up to 2 auxiliary points for each main point are placed at a max. distance of 100px. of that point. Each aux. point is connected to a max. of 5 other points.



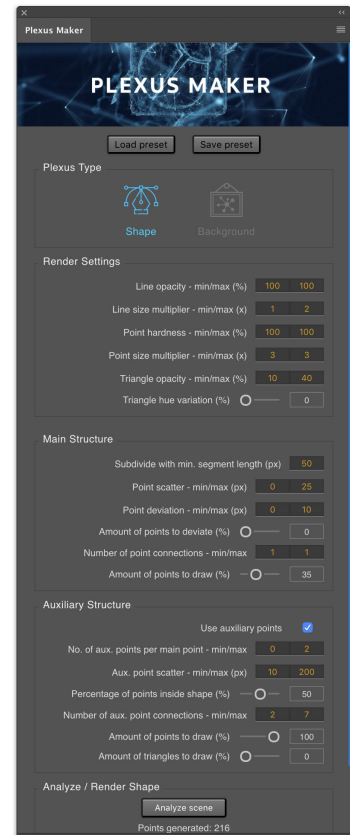
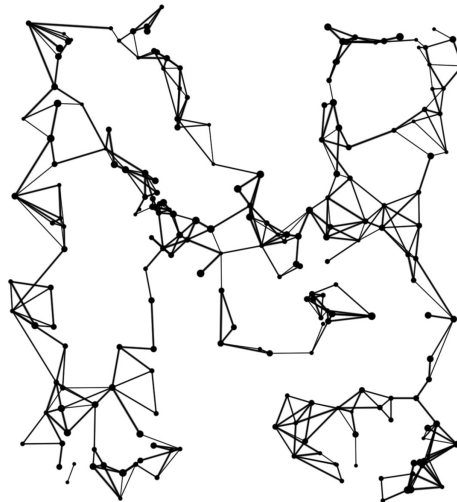
Auxiliary points are placed inside and outside of the shape. Only up to 65% of main points, responsible for the the initial shape are retained.



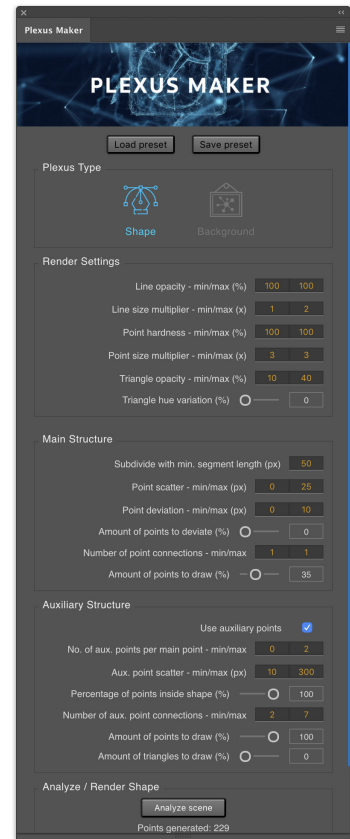
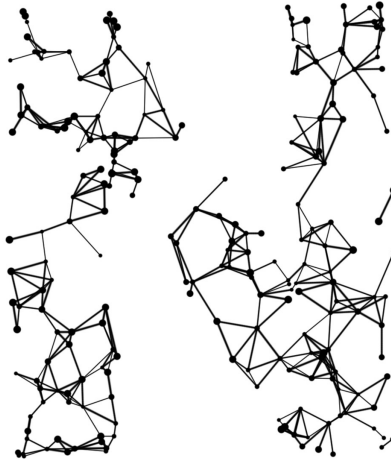
Greater auxiliary point scatter, in and outside of the shape. Shape structure is preserved by keeping scatter on Main structure to 0. Triangles are used too.



Auxiliary points go inside and outside of the slightly distorted shape.

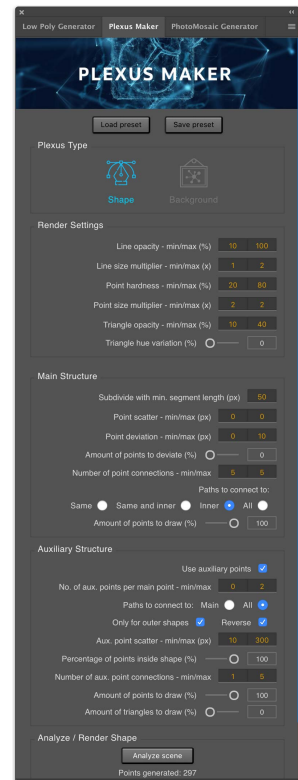
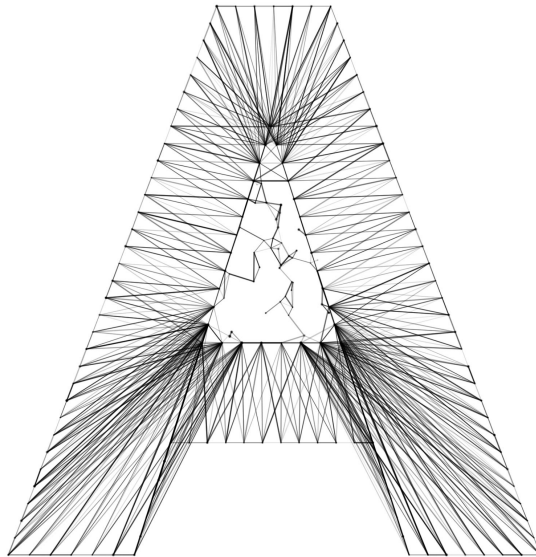


Scatter on Main structure subtly distorts the shape. Auxiliary points are scattered deep inside the shape.



**UPDATED VERSION**

Main points are connected only to the inner shape.  
Auxiliary points are only generated inside inner shape.



The following images display how the 3D effect was created, from the front towards the back layers - each layer is rendered with different settings and is set to roughly 98% the size of the one in front; back layers have more lens blur/gaussian blur applied.

Several Background plexuses are used as well, they have been scaled up and blurred.



## Got a question?

For more information, feel free to contact **Artorius** via the dedicated [GraphicRiver](#) profile page.