Stylized Lines

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The PxrStylizedLines filter allows you to add linework to your Stylized rendering. It can be used on its own for technical drawing looks or combined with toon and hatching for more creative looks. You can even layer a number of PxrStylizedLines filters on top of each other to create color, breakup, and width variation to emulate various traditional linework techniques.

Result

Use these settings to preview certain AOVs to aid in the development of your creative linework.

- ***Disable*** - turns this node off, and shows the previous beauty of the daisy chain if another DisplayFilter connected before this one, or just the regular beauty render if no other DisplayFilter node connected
- ***Final Lines Comp -*** view the output of the final lines composited over the previous layer (based on mode chosen in Compositing Page))
- ***Final Lines -*** view the output of the lines only
- ***Visualizer -*** menu items below this separator indicate modes likely used for debugging and visualization purposes
- ***Final Lines Invert*** - an inverted visualization of your lines
- ***Final Lines Alpha*** - alpha mask channel generated by the lines.
- ***Line Thickness from PxrStylizedControl -*** Visualize the thickness of your lines being generated from any patterns or textures plugged into the Line Thickness Input of your ***PxrStylizedControl*** node.
- ***Line Thickness from Lighting -*** visualize the line thickness generated from the scene lighting
- **Signal Luminance** - correct RGB weighting for converting color to grayscale, currently not used in any modes, just a visualizer
- **Signal Energy** - the internal "white shader pass" that this node creates and uses to blend the hatching

> ⓘ **Pro Tip:**
> During an interactive render, try changing the ***Result*** dropdown for different modes

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Line Detection Page

Type

Line detection type. Based on selection, selects different data AOV to run line detection on:

Outline - line on alpha of object
Sections - line on random id
LineNZ - line on combination of X Y components of surface normal and Z depth, good for unit scale
Curvature - line on change in surface normal
Camdist - line on change in camera distance
Custom AOV - custom AOV defined below

Data AOV

The name of a color AOV to do line detection on.

Typically this would be diffuse, but you can also put a light AOV here to determine the transition between photoreal and stylized based on the light emission. This AOV has to be set up in Maya/Katana/Houdini or DisplayFilter will exit.

Write To Type AOV

Overwrite the Data AOV choses in Type above with result of line detection. Typically we don't need the original data AOV once the line detection has been computed, so for visualization and compositing purposes, writes over this AOV with the final result of the line detection.

Weight

During line detection weighting to get a variance

Different weight types graph (interactive graph https://www.desmos.com/calculator/q2pkrrwv8h):

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Activation

During line detection weighting to get a variance. Choose between Spline for user to set custom control points, or Sigmoid.

Sigmoid Sharpness

See: https://www.desmos.com/calculator/g4jbxcvtqz and modify sharpness variable "a"

Sigmoid Offset

 See: https://www.desmos.com/calculator/g4jbxcvtqz and modify offset variable "o"

Line Thickness Page

Line Thickness

The thickness of the lines, measured in pixels

Line Thickness Remap Page

by PxrStylizedControl

Multiply Line Thickness by Line Thickness values on PxrStylizedControl per object

PxrStylizedControl Scale

Globally scale line thickness. If you have line thickness set per object and they are all different values, and you up the resolution of the render, use this global scale to increase or decrease line thickness of all lines, since they are based on pixel width.

by Z Depth

Multiply Line Thickness by Z Depth

Cam Dist Z Min

Remap camera distance: Linear step Min on Z (blue channel from lineNZ)

Cam Dist Z Max

Remap camera distance: Linear step Max on Z (blue channel from lineNZ)

Z Min Thickness Scale

At Cam Dist Z Min, scale line thickness by this amount

Z Max Thickness Scale

At Cam Dist Z Max, scale line thickness by this amount

by Lighting

Multiply Line Thickness by Lighting signal (view Line Thickness From Lighting in Visualizer dropdown to see this signal)

Low Mult

Scale (multiply) Line Thickness by this value in shadows

High Mult

Scale (multiply) Line Thickness by this value in light areas

Invert

Invert min max above: so thicker in shadows

Gamma

Apply gamma curve to light response to drive thickness

Input Page

Signal

Name of a color AOV to use for the light signal to line color and line thickness by lighting. Typically diffuse, can put any light AOV here. This AOV has to be setup in Maya/Katana/Houdini or DisplayFilter will exit.

Mode

Under the hood a white shader approximation is created based off the Signal AOV to drive the Hatching. By default using average of RGB components of Signal AOV, but can also divide Signal AOV lighting results with a pure albedo from NPRalbedo AOV or albedo AOV. If NPRalbedo AOV chosen, must set Albedo Color in Stylized Controller Pattern node.

Dilation Sorting Page

Enable

When turned on: dilates the signals that contributed to the lines (albedo color, thickness, z-depth, ...) to go off the geometry, since the line detection goes off the geometry. If Dilate Sort is off, there will be an undesirable double-line corresponding to the incorrect data off geometry. Also sorts to assign higher priority to objects closer to camera.

Radius

The size of the radius, in pixels, to dilate the signals.

Depth Scale

Scale Z depth for sorting based on scene scale

Weight

Same weight types as for Line thickness edge detection, but for Dilate Sort radius

Use Alpha

If the object has an alpha channel: the zero alpha on camera depth will be incorrect. Instead, switch to ON to mix between camera depth of objet and Dilate_Sort_Max_depth based on alpha

Max Depth

Max Depth to consider for outside of alpha

Line Color Page

From

Offers a number of different options to determine line color:

Color Swatch - Choose the color from Line Color below for all lines from this node
PxrStylizedControl - Pickup line color from PxrStylizedControl pattern node
NPRalbedo AOV - Pickup line color from ***NPRalbedo*** AOV, which is set by the PxrStylizedControl pattern node
albedo AOV - Pickup line color from factory RenderMan ***albedo*** AOV

Line Color

Color swatch to choose color

Light Tint

Colors lines based on lighting from light to shadow:

HSV Light Dark - Choose Hue/Saturation/Value tint's in Light & Dark (shadow) portions of the lighting
Line Color Shadow - Choose line color in the shadow areas

Line Distort Page

New in RenderMan v25!

Enable

Turn on Line Distort features

Offset

Amount to distort line off original position

Remap

Remap line distort signal (typically PxrFractal plugged into PxrStylizedControl Distort/Distort U & Distort V input) between -1 to 1 (assuming it is originally from 0 to 1)

Demo videos

Mask Page

PxrStylizedControl Mask

Use mask configured in PxrStylizedControl pattern node

Input Mask

Use Input/Signal data above as mask for previously daisy-chained Stylized shaders and/or physically based lighting

Final Line Gamma

After line detection happens, runs gamma on final lines. When using the Curvature Line Type, you can use this parameter to control the curvature falloff to fine-tune your linework

Lines Inside Alpha

Mult by alpha for only inside lines from line detect, don't go off geo

Compositing Page

Mode

Over - using alpha of Lines, composite over previous layer
Plus - using alpha of Lines, add with previous layer
Multiply - using alpha of Lines, multiply with previous layer
[Link](#)

Linework Tips

- To gain extra solidness to lines, try changing the Weight Type to Hermite or Double Sigmoid
- Add creative variety to your lines by breaking up and varying the width with a texture or pattern plugged into the Line Thickness input of your PxrStylizedControl node.
- Try experimenting with linework by layering up various PxrStylizedLines filters, each one with their own unique widths, colors, and thickness.