

## 10.1.9 Editors - Compositor Editor - Header - Add Menu - Filter

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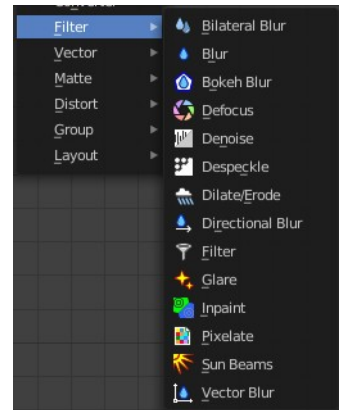
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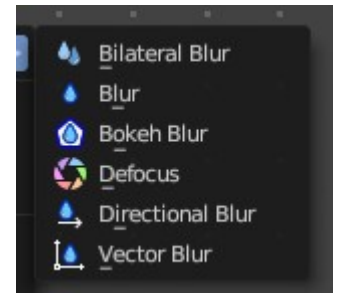
## Add menu - Filter

The Filter add menu contains multiple filters you can use on image data, including blurs and other lens effects.



### Blur – Sub Menu

This sub menu contains blur nodes.



### Bilateral Blur

The Bilateral Blur node performs a high-quality adaptive blur on the source image, allowing to blur images while retaining their sharp edges.

It can be used for various purposes like: smoothing noisy render passes to avoid longer computation times in example ray-traced ambient occlusion, blurry refraction's/reflections, soft shadows, or to make non-photo realistic compositing effects.

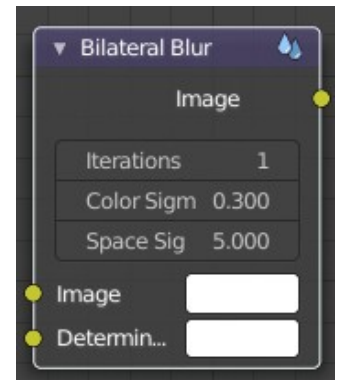
#### Inputs

##### Image

Standard image input. If only the image input is connected, the node blurs the image depending on the edges present in the source image.

##### Determinator

Which is non-obligatory and if the Determinator is connected, it serves as the source for defining edges/borders for the blur in the image. This has great advantage in case the source image is too noisy, but normals in combination with Z-buffer can still define exact borders/edges of objects.



## Properties

### Iterations

Defines how many times the filter should perform the operation on the image. It practically defines the radius of blur.

### Color Sigma

Defines the threshold for which color differences in the image should be taken as edges.

### Space Sigma

A fine-tuning variable for blur radius.

## Outputs

### Image

Standard image output.

## Blur

The Blur node provides several blur modes to blur an image. The icon top right allows you to collapse and show the image part of the node.

### Inputs

#### Image

Standard image input.

#### Size

The optional Size input will be multiplied with the X and Y blur radius values. It accepts also a value image, to control the blur radius with a mask. The values should be mapped between (0 to 1) for an optimal effect.



## Properties

### Filter Type

The difference between the types is in the way they handle sharp edges, smooth gradients and preserve the highs and the lows.

#### Flat

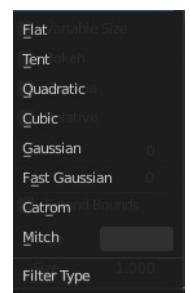
Simply blurs everything uniformly.

#### Tent

Preserves the high and the lows better by making a linear falloff.

#### Quadratic

Looks similar to Gaussian but can be a little faster but slightly worse looking.



### ***Cubic***

Preserve the highs, but give an almost out-of-focus blur while smoothing sharp edges.

### ***Gaussian***

Gives the best looking results but tends to be the slowest.

### ***Fast Gaussian***

An approximation of the Gaussian.

### ***Catmull-Rom***

Catmull-Rom keeps sharp contrast edges crisp.

### ***Mitch***

Preserve the highs, but give an almost out-of-focus blur while smoothing sharp edges.

### **Variable Size**

Allows a variable blur radius, if the size input is an image.

### ***Bokeh***

The Bokeh button will force the Blur node to use a circular blur filter. This gives higher quality results, but is slower than using a normal filter.

### ***Gamma***

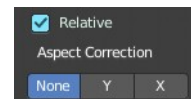
The Gamma button applies a gamma correction on the image before blurring it.

### ***Relative***

Percentage Value of the blur radius relative to the image size.

### **Aspect Correction**

A subset of the Relative property. None, Y, X



### **X, Y**

Values set the ellipsoid radius in numbers of pixels over which to spread the blur effect.

### **Extend Bounds**

Allows the image, that is being blurred, to extend past its original dimension.

### ***Outputs***

#### **Image**

Standard image output.



## Bokeh Blur

The Bokeh Blur node generates a bokeh type blur similar to Defocus. Unlike defocus an in-focus region is defined in the Compositor.

Several performance optimizations are also available such as OpenCL support, calculation area restriction and masking.

### Inputs

#### Image

Standard image input.

#### Bokeh

This is an input for the Bokeh Image node.

#### Size

Size controls the amount of blur. Size can either be a single value across the entire image or a variable value controlled by an input image. In order to use the latter, the Variable Size option must be selected. See the examples section below for more on how to use this.

#### Bounding Box

This can be used with a Box Mask matte node or with a Mask input node to restrict the area of the image the blur is applied to. This could be helpful, for example, when developing a node system by allowing only a small area of the image to be filtered thus saving composite time each time adjustments are made.

### Properties

#### Variable Size

Allows a variable blur radius, if the Size input is an image.

#### Max blur

Max blur is intended to act as an optimization tool by limiting the number of pixels across which the blur is calculated.

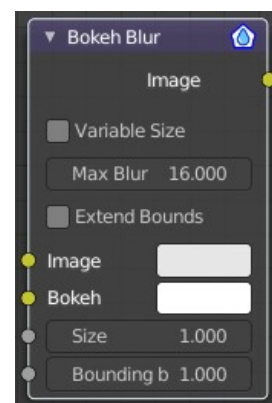
#### Extend Bounds

Extend the bounds of the input image to fully fit the blurred image.

### Outputs

#### Image

Image output.



## Defocus

It is typically used to emulate depth of field (DOF) using a post-processing method with a Z-buffer input. But also allows to blur images that are not based on Z depth too.

### Inputs

#### Image

Standard image input.

#### Z

Z-buffer input, but could also be a (greyscale) image used as a mask, or a single value input.

### Properties

#### Bokeh Type

The number of iris blades of the virtual camera's diaphragm.

Disk (to emulate a perfect circle) or Triangle (3 blades), Square (4 blades), Pentagon (5 blades), Hexagon (6 blades), Heptagon (7 blades) or Octagon (8 blades).

#### Angle

This button is deactivated, if the Bokeh Type is set to Disk. It can be used to add a rotation offset to the Bokeh shape. The value is the angle in degrees.

#### Gamma Correction

Applies a gamma correction on the image before and after blurring it.

#### F-Stop

This option controls the amount of focal blur in the same way as a real camera. It simulates the aperture  $f$  of a real lens' iris, without modifying the luminosity of the picture. The default value 128 is assumed to be infinity: everything is in perfect focus. Half the value will double the amount of blur. This button is deactivated, if No Z-buffer is enabled.

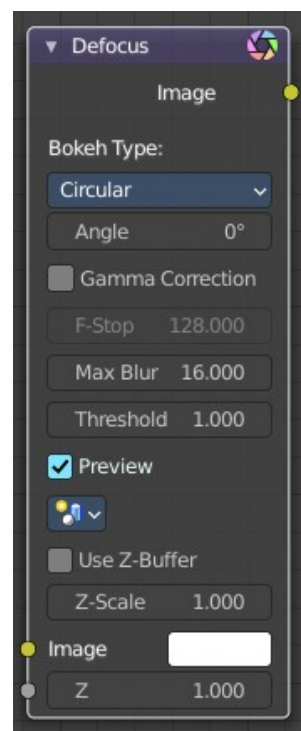
#### Max Blur

This value limits the amount of blur by setting a maximum blur radius. Could be used to optimize the performance. The default value of 0 means no limit.

#### Threshold

Some artifacts, like edge bleed, may occur, if the blur difference between pixels is large. This value controls how large that blur difference considered to be safe.

Tip! Only change this value, if there is an occurring problem with an in-focus object.

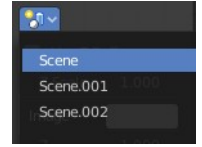


## Preview

If enabled a limited amount of (quasi-)random samples are used to render the preview. This way of sampling introduces additional noise, which will not show up in the final render.

## Scene

Select the linked scene. Scenes can be created in the properties editor in the Scene properties tab in the Scene panel.



## Use Z-buffer

Should be activated for a non Z-buffer in the Z input. No Z-buffer will be enabled automatically whenever a node that is not image based is connected to the Z input.

## Z Scale

Only active when No Z-buffer is enabled. When No Z-buffer is used, the input is used directly to control the blur radius (similar to F-Stop when using the Z-buffer). This parameter can be used to scale the range of the Z input.

## Outputs

### Image

Image output.

---

## Directional Blur

Blurs an image in a specified direction and magnitude. Can be used to fake motion blur.

### Inputs

#### Image

Standard image input.

### Properties

#### Iterations

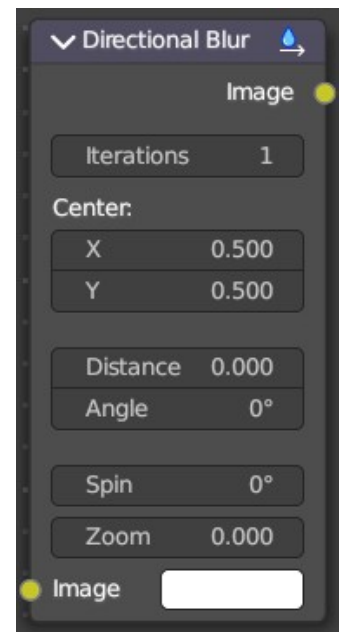
Controls how many times the image is duplicated to create the blur effect. Higher values give smoother results.

#### Center X, Y

Sets the position where the blur center is. This makes a difference if the angle, spin, and/or zoom are used.

#### Distance

How large the blur effect is.



## Angle

Image is blurred at this angle from the center.

## Spin

Rotates the image each iteration to create a spin effect, from the center point.

## Zoom

Scales the image each iteration, creating the effect of a zoom.

## Outputs

### Image

Image output.

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## Vector Blur

The Vector Blur node is a fast method for simulating Motion blur in compositing. It uses the vector speed render pass to blur the image pixels in 2D.

## Inputs

### Image

Image input, to be linked to the “Combined” render pass.

### Z

Z depth, to be linked to the “Depth” render pass.

### Speed

Input for the “Vector” render pass. See Cycles render passes.

## Properties

### Samples

Quality factor.

### Blur

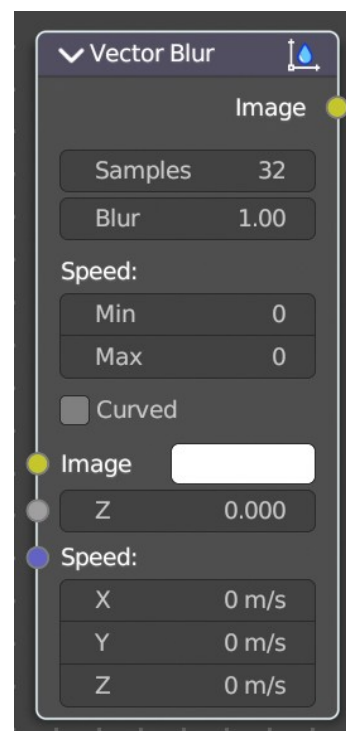
Scaling factor for the motion vector (actually the “shutter speed” in frames).

### Speed

The vector blur could produce artifacts like streaks, lines and other. To tackle these problems, the filter applies clamping, which can be used to limit which pixels get blurred. The speed is set in pixel units.

### Min

The minimum threshold for moving pixels can separate the hardly moving pixels from the moving ones.



Especially when the camera itself moves, the vector mask can become the entire image.

### **Max**

The maximum threshold. The majority of artifacts are caused by pixels moving too fast.

## **Outputs**

### **Image**

Motion blurred image output.

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## **Anti-Aliasing**

Adds antialiasing to edges in an image.

### **Inputs**

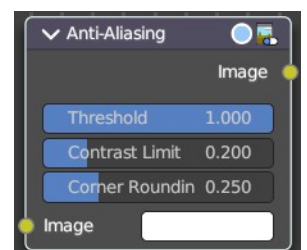
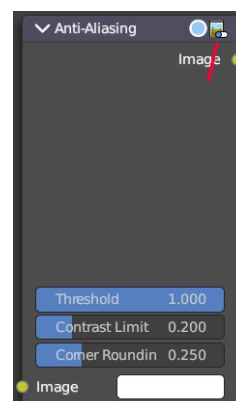
#### **Image**

Standard image input.

### **Properties**

#### **Threshold**

Threshold to detect edges.



## ***Contrast Limit***

How much to eliminate suspicious edges to avoid artifacts.

## ***Corner Rounding***

How much sharp corners will be rounded.

## **Outputs**

### ***Image***

Standard image output.

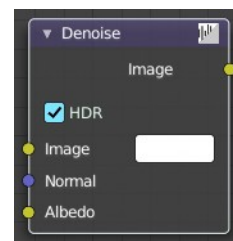
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## **Denoise**

The Denoise node is used to denoise renders from Cycles and other ray tracing renderers. This helps to significantly reduce render time by rendering with fewer samples.

It uses Open Image Denoise, which transforms noisy images into clean images with machine learning.



## **Inputs**

### ***Image***

Noise image input.

### ***Normal***

Optional normal render pass to better preserve detail. For Cycles, it is recommended to use the Denoising Normal render pass, which is available when enabling the Denoising Data passes.

### ***Albedo***

Optional Albedo render pass to better preserve detail. For Cycles, it is recommended to use the Denoising Albedo render pass, which is available when enabling the Denoising Data passes.

## **Properties**

### ***HDR***

Preserve colors outside the 0 to 1 range.

## Outputs

### *Image*

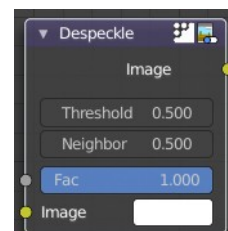
Denoised image output.

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## Despeckle

The Despeckle node is used to smooth areas of an image in which noise is noticeable, while leaving complex areas untouched.

This works by the standard deviation of each pixel and its neighbors is calculated to determine if the area is one of high complexity or low complexity. If the complexity is lower than the threshold then the area is smoothed using a simple mean filter.



## Inputs

### *Factor*

Controls the amount the filter effects the image.

### *Image*

Standard image input.

## Properties

### *Threshold*

The threshold to control high/low complexity.

### *Neighbor*

The threshold to control the number of pixels that must match.

## Outputs

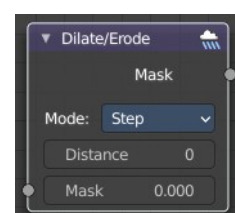
### *Image*

Standard image output.

---

## Dilate/Erode

The Dilate/Erode node provides a morphology (mathematical shape analysis) filter.



## Inputs

### **Mask**

Single color channel (or a black-and-white image) input.

## Properties

### **Mode**

There are four different dilate / erode modes. Step, Threshold, Distance and Feather.



### **Distance**

The Distance is the filter radius. A positive value of Distance dilates (expands) the influence of a pixel on its surrounding pixels. A negative value erodes (shrinks) its influence.

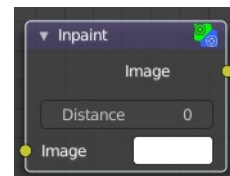
## Outputs

### **Mask**

The filtered mask output.

## Inpaint

The Inpaint node is used to extend borders of an image into transparent or masked regions. This can be useful to solve problems like “wire removal” and holes created during chroma keying.



## Inputs

### **Image**

Standard image input.

## Properties

### **Distance**

The number of times to extend the image.

## Outputs

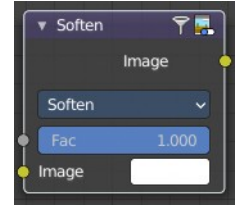
### **Image**

Standard image output.



## Filter

The Filter node implements various common image enhancement filters.



## Inputs

### **Factor**

Controls the amount of influence the node exerts on the output image.

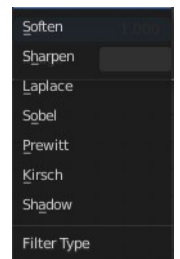
### **Image**

Standard image input.

## Properties

### **Filter Type**

The available filter types. Soften, Laplace, Sobel, Prewitt and Kirsch all perform edge detection (in slightly different ways) based on vector calculus and set theory equations.



### **Soften**

Slightly blurs the image.

### **Sharpen**

Increases the contrast, especially at edges.

### **Laplace**

Softens around edges.

### **Sobel**

Creates a negative image that highlights edges.

### **Prewitt**

Tries to do Sobel one better.

### **Kirsch**

Giving a better blending than Sobel or Prewitt, when approaching an edge.

### **Shadow**

Performs a relief, emboss effect, darkening outside edges.

## Outputs

### **Image**

Standard image output.

## Glare

The Glare node is used to add lens flares, fog, glows around exposed parts of an image and much more.

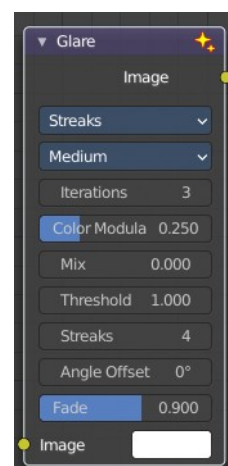
### Inputs

#### *Image*

Standard image input.

### Properties

Note that some of the properties just appears with the corresponding glare type and the corresponding quality setting.



### *Glare Type*

#### **Ghosts**

Creates a haze over the image.



#### **Streaks**

Creates bright streaks used to simulate lens flares.

#### **Fog Glow**

Looks similar to Ghost. However, it is much smaller in size and gives more of an atmospheric haze or “glow” around the image.

#### **Simple Star**

Works similar to Streaks but gives a simpler shape looking like a star.

#### **Streaks**

Total number of streaks.

#### **Angle Offset**

The rotation offset factor of the streaks.

#### **Fade**

Fade out factor for the streaks.

#### **Size**

Scale of the glow relative to the size of the original bright pixels.

## ***Fade***

Fade out factor for the streaks.

## ***Rotate 45***

Rotate the streaks by 45°.

## ***Quality***

If not set to something other the High, then the glare effect will only be applied to a low resolution copy of the image. This can be helpful to save render times while only doing preview renders.

## ***Iterations***

The number of times to run through the filter algorithm. Higher values will give more accurate results but will take longer to compute. Note that, this is not available for Fog Glow as it does not use an iterative-based algorithm.

## ***Color Modulation***

Used for Streaks and Ghosts to create a special dispersion effect.

Johannes Itten describes this effect, Color Modulation, as subtle variations in tones and chroma.

## ***Mix***

Value to control how much of the effect is added on to the image. A value of -1 would give just the original image, 0 gives a 50/50 mix, and 1 gives just the effect.

## ***Threshold***

Pixels brighter than this value will be affected by the glare filter.

## **Outputs**

### ***Image***

Standard image output.

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## **Kuwahara**

Kuwahara is a filter that converts a realistic image into a stylized image.

## **Inputs**

### ***Image***

Standard image input.



## Properties

### ***Kuwahara Filter***

There are two Kuwahara variations available. Classic and Anisotropic.

#### **Classic**

##### ***Size***

The size of the Kuwahara filter.

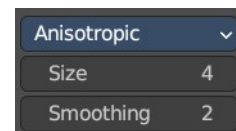
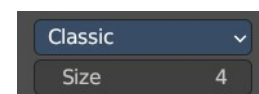
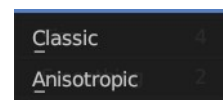
#### **Anisotropic**

##### ***Size***

The size of the Kuwahara filter.

##### ***Smoothing***

Smoothing degree before applying filter.



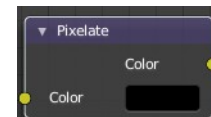
## Outputs

### ***Image***

Standard image output.

## Pixelate

Add this node in front of a Scale node to get a pixelated (non-smoothed) image from the resultant upscaled image.



## Inputs

### ***Color***

Standard image input.

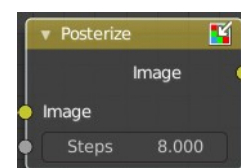
## Outputs

### ***Color***

Image output.

## Posterize

The Posterize node reduces the number of colors in the image to a palette. The exact number of output colors is not to set. Just a number of steps to reduce the existing colors.



## Inputs

### *Image*

The image to reduce the colors at.

### *Steps*

The number of steps to perform a color reduction.

## Outputs

### *Image*

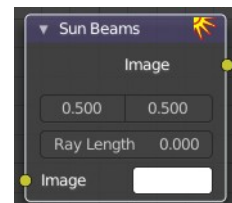
Standard image output.

---

## Sun Beams

The Sun Beams node provides a computationally cheap way of creating the name giving effect based on the image brightness alone.

Sun Beams is a 2D effect for simulating the effect of bright light getting scattered in a medium (Crepuscular Rays). This phenomenon can be created by renderers, but full volumetric lighting is a rather arduous approach and takes a lot of render time.



## Inputs

### *Image*

Standard image input.

## Properties

### *Source width, height*

Source point of the rays as a factor of the image dimensions.

### *Ray length*

Length of the rays as a factor of the image size.

## Outputs

### *Image*

Image output.