Extending Inkscape with SVG Filters

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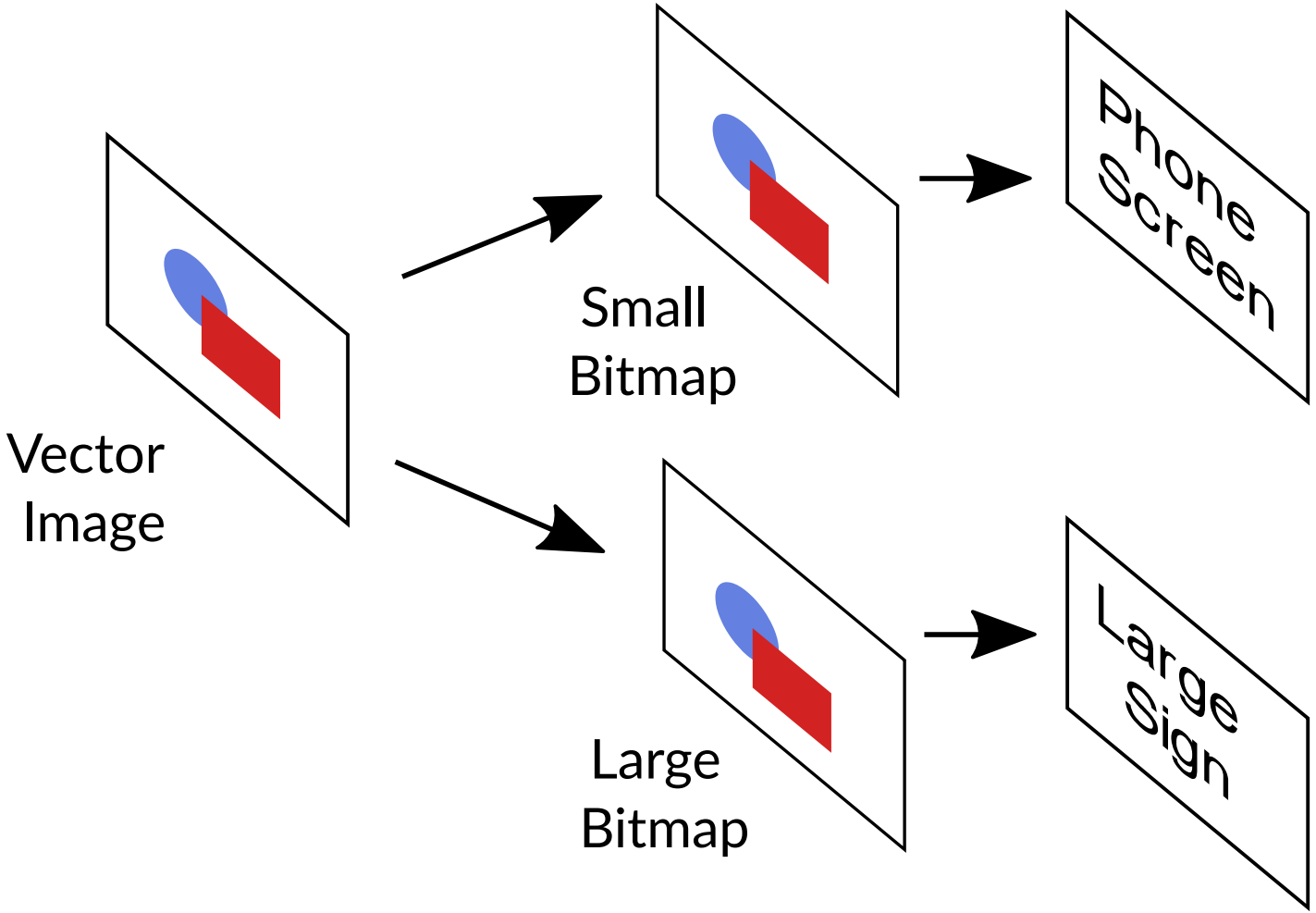
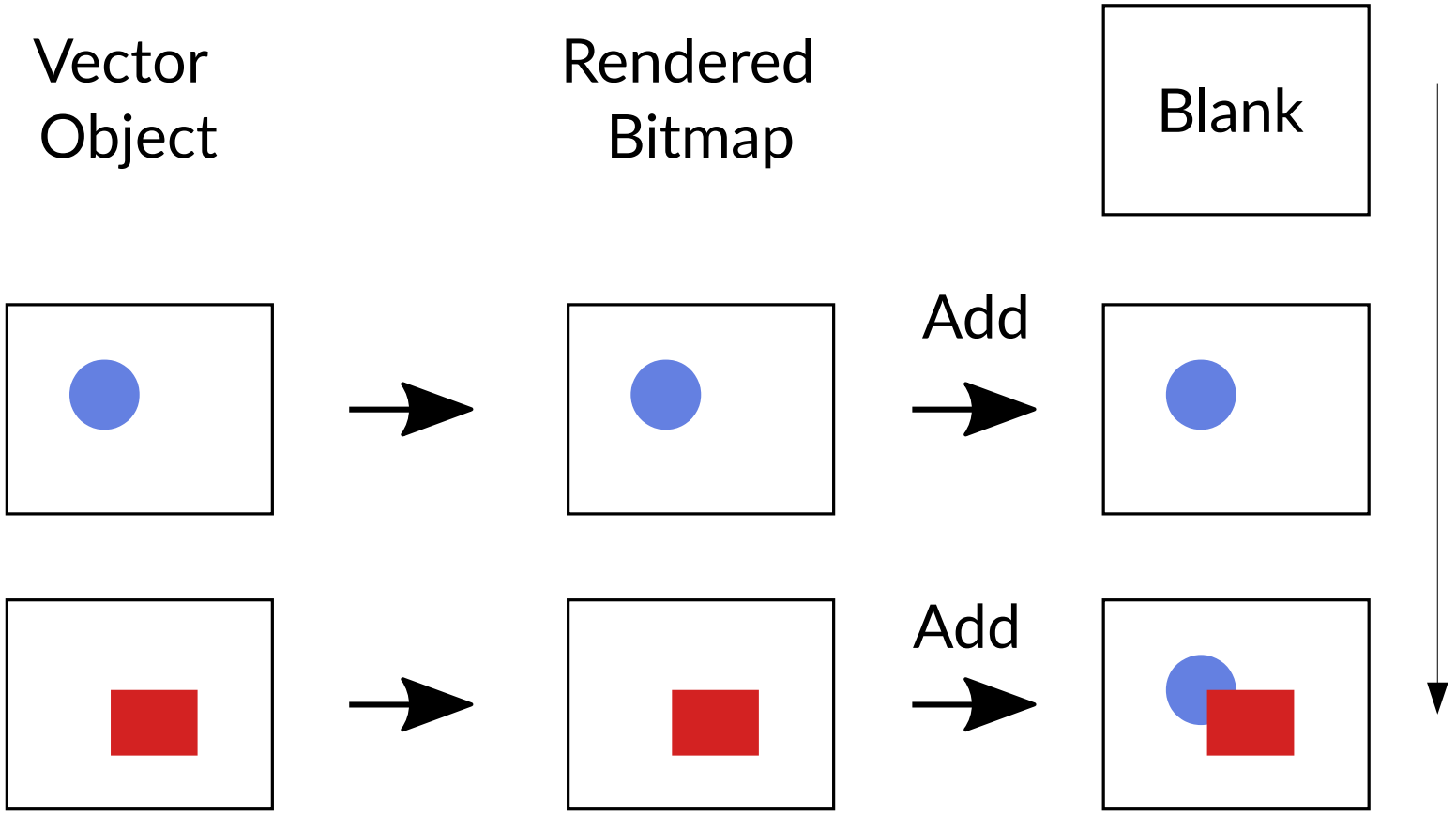
SVG Filters

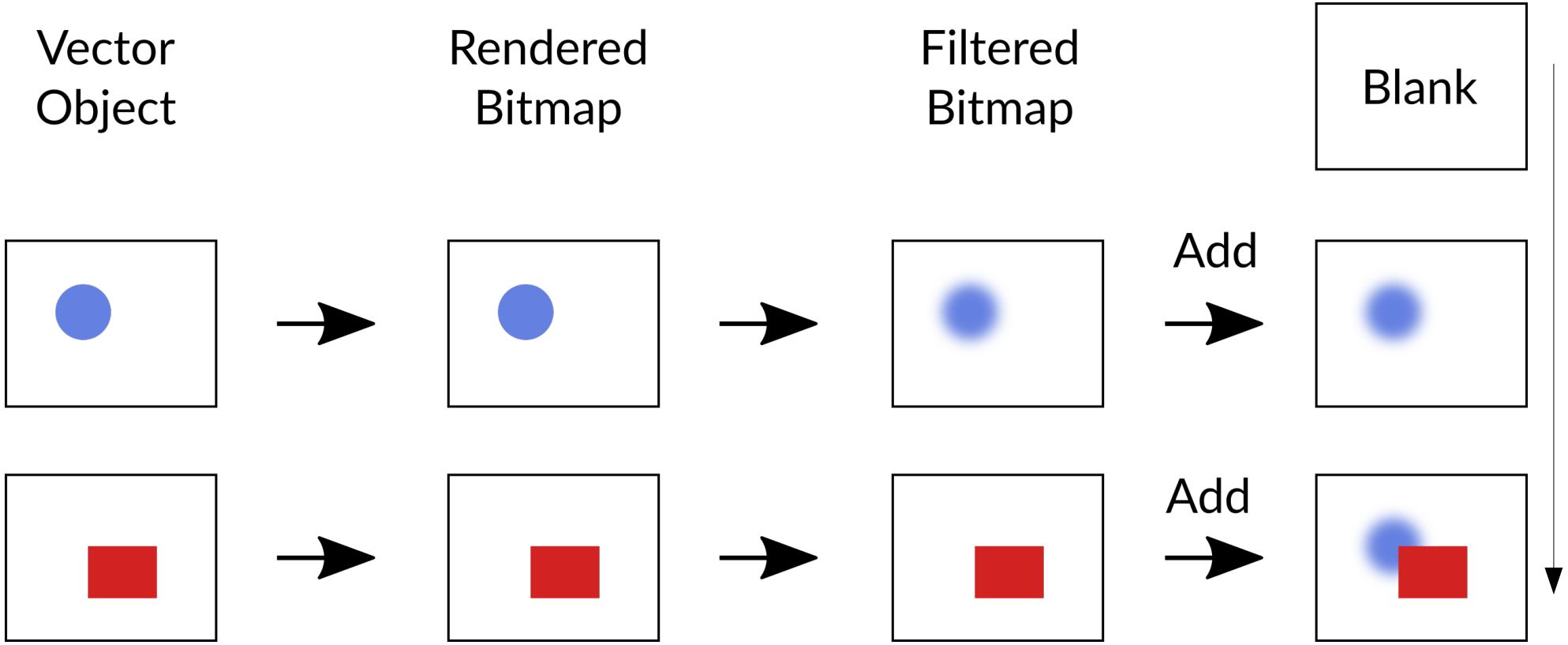
- Part of the SVG spec since 1.0
- Provides a way to modify the render pipeline of graphics application to modify the interim bitmaps
- Allows artist to do creative effects that are typically associated with bitmap editors (GIMP, Photoshop, etc.)
- Can be a powerful way to keep common design elements between different artifacts of an overall project

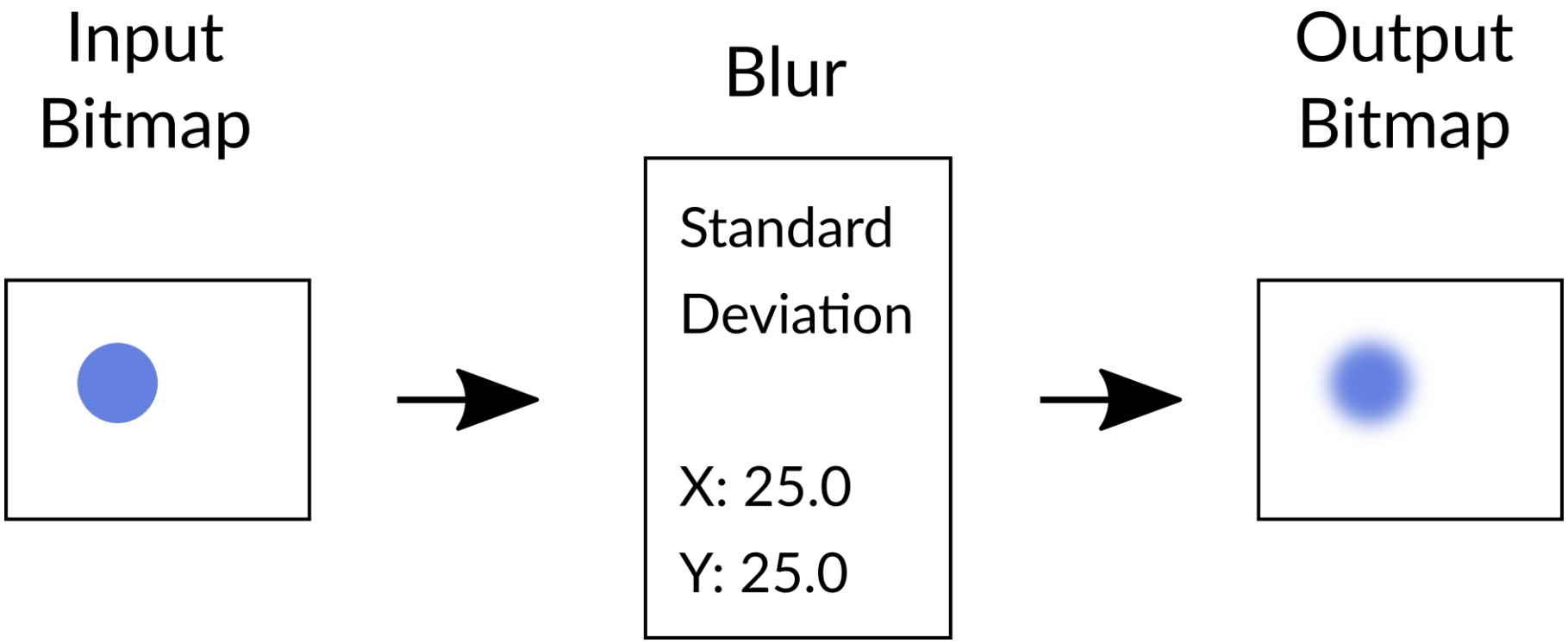
Traditional Vector Graphics

Filters and Gradients Vector Graphics

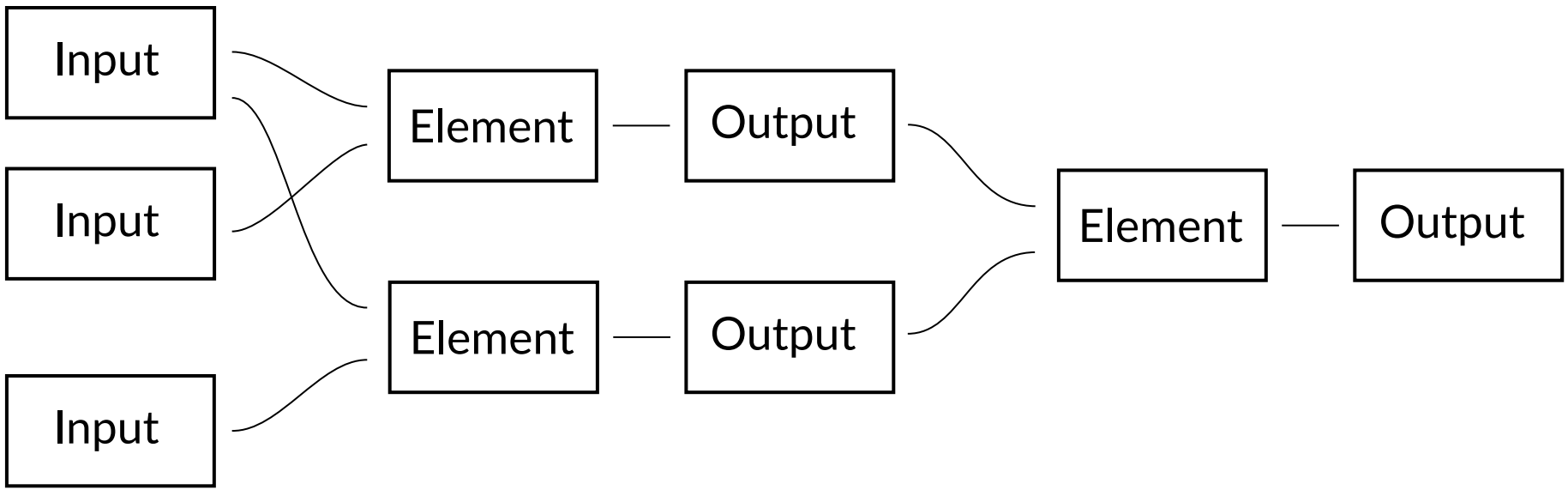

Vector
Image
Small
Bitmap
Phone
Screen
Large
Bitmap
Large
Sign


Vector Object
Rendered Bitmap
Blank
Add
Add

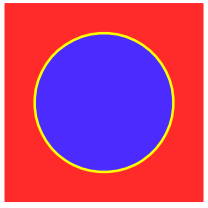

Vector Object
Rendered Bitmap
Filtered Bitmap
Blank
Add
Add


Input
Bitmap
Blur
Standard
Deviation
X: 25.0
Y: 25.0
Output
Bitmap

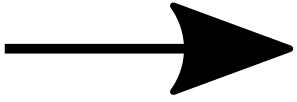
Multiple SVG Filter Elements as a graph

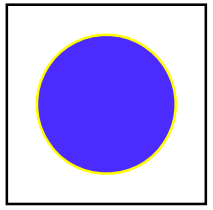


SVG Filter Element Inputs

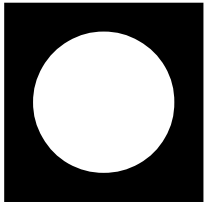


Source Graphic
Filter on Blue Circle



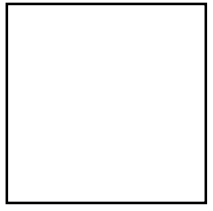


Source
Image



Source
Alpha

Background

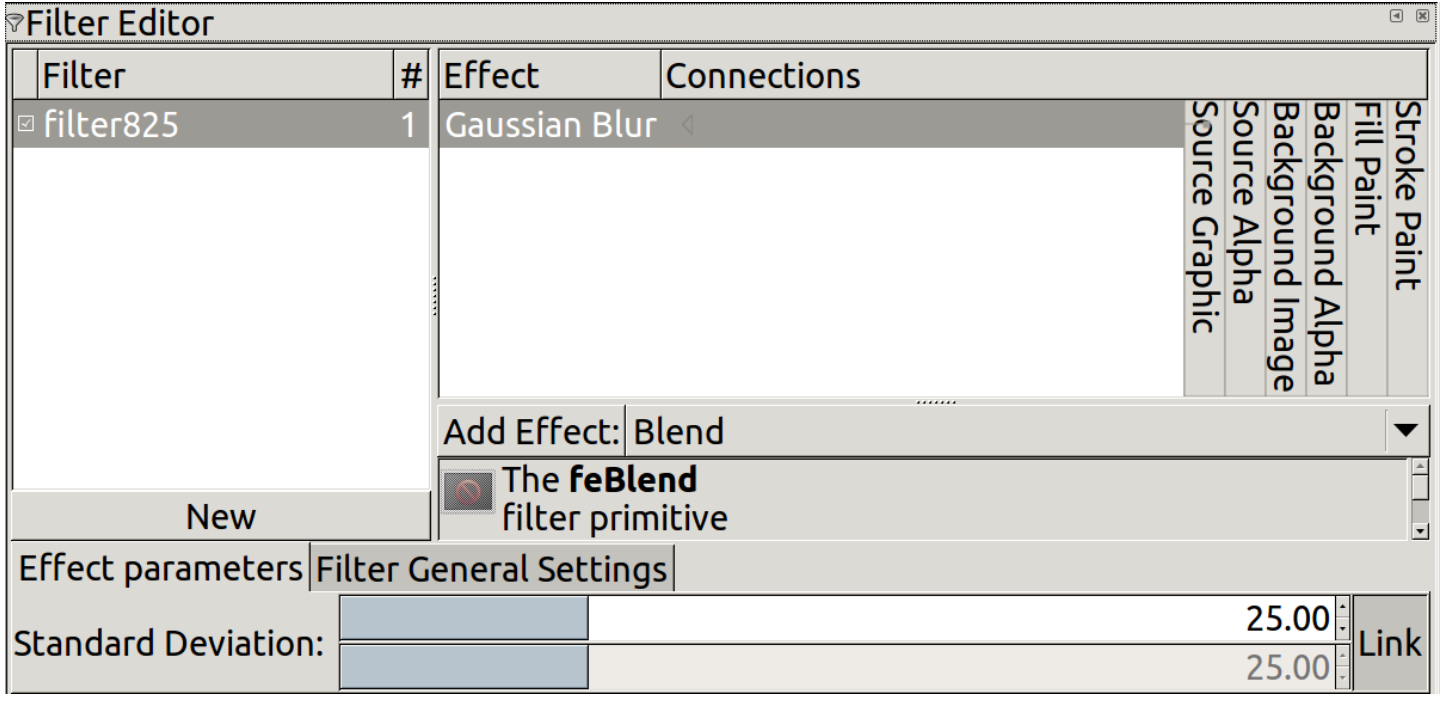


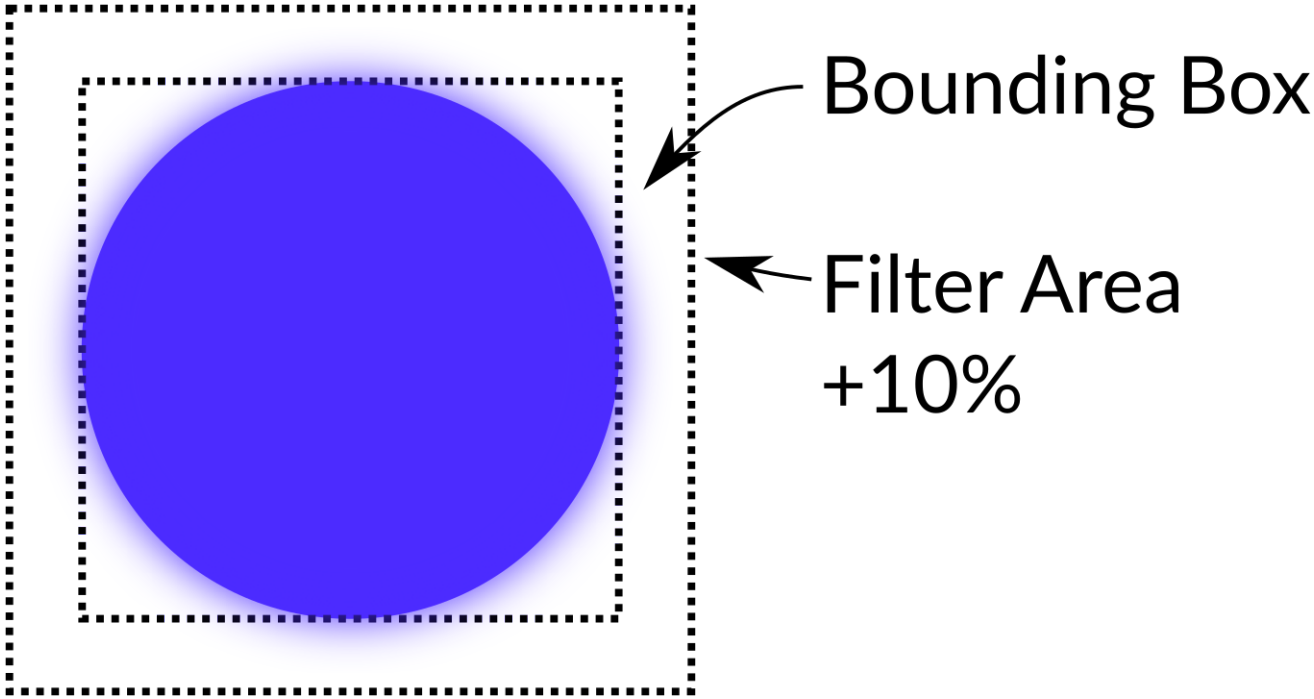
Background
Alpha

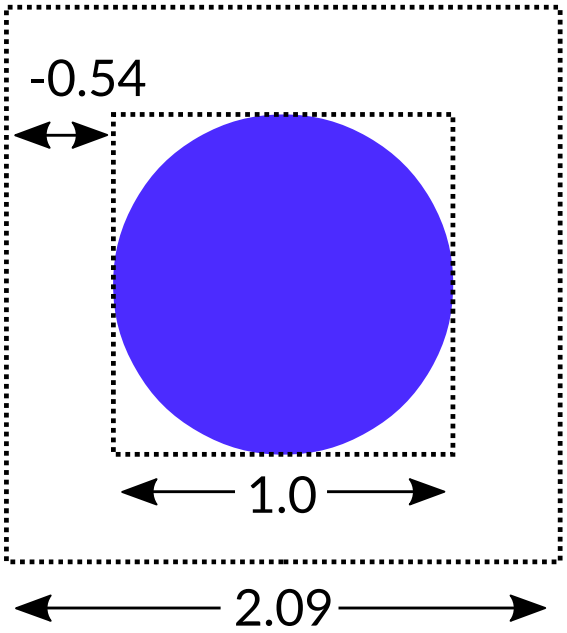
Stroke
Color

Fill
Color

Inkscape Filter Dialog




Bounding Box
Filter Area
+10%



Filter Editor

Filter	#
filter825	1

New

Effect	Connections
Gaussian Blur	Stroke Paint, Fill Paint, Background Alpha, Background Image, Source Alpha, Source Graphic

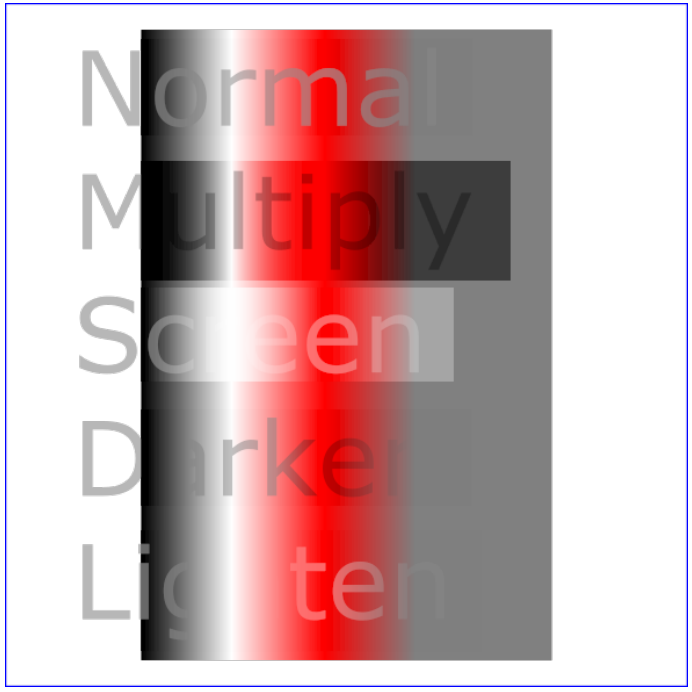
Add Effect: Blend

The **feBlend** filter primitive

Effect parameters | Filter General Settings

Coordinates:	-0.54	-0.49
Dimensions:	2.09	1.97

feBlend

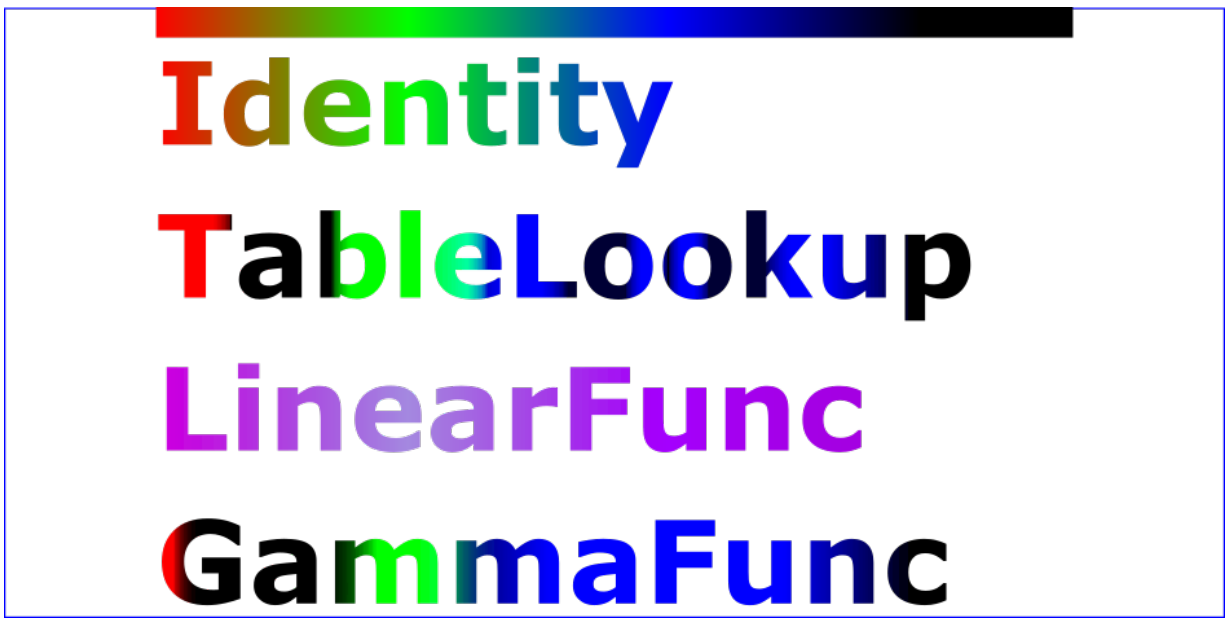


https://www.w3.org/TR/SVG11/filters.html

feColorMatrix

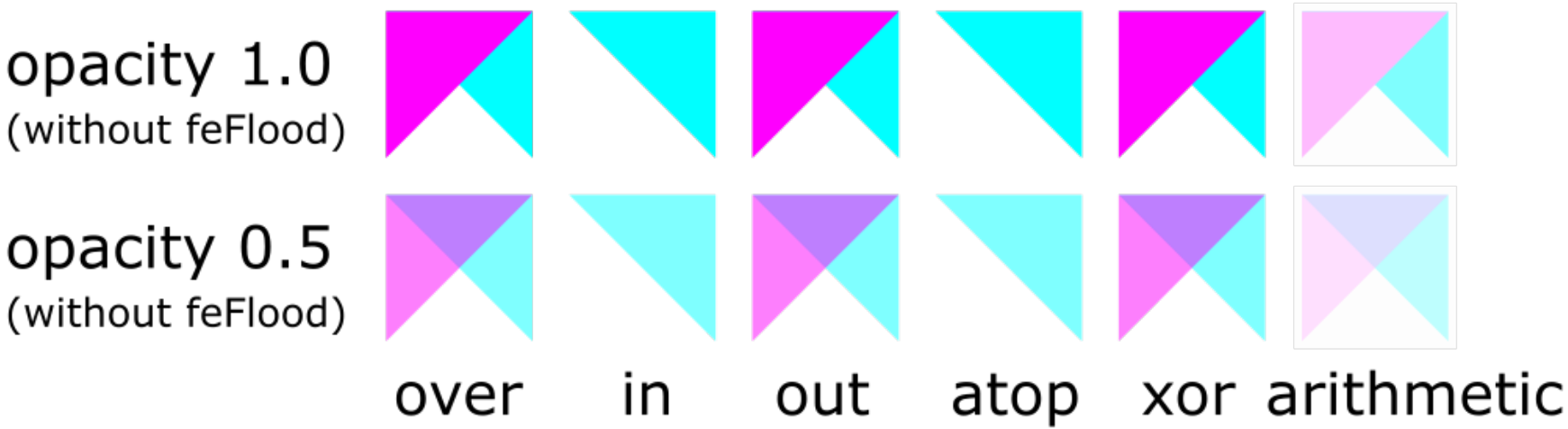
https://www.w3.org/TR/SVG11/filters.html

feComponentTransfer



https://www.w3.org/TR/SVG11/filters.html

feComposite

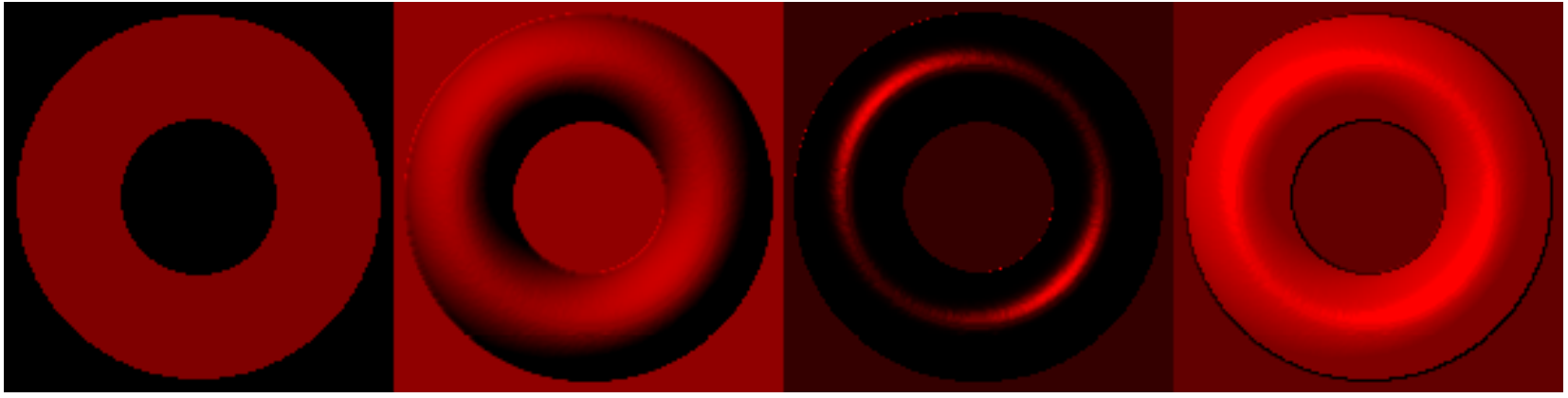


https://www.w3.org/TR/SVG11/filters.html

feConvolveMatrix

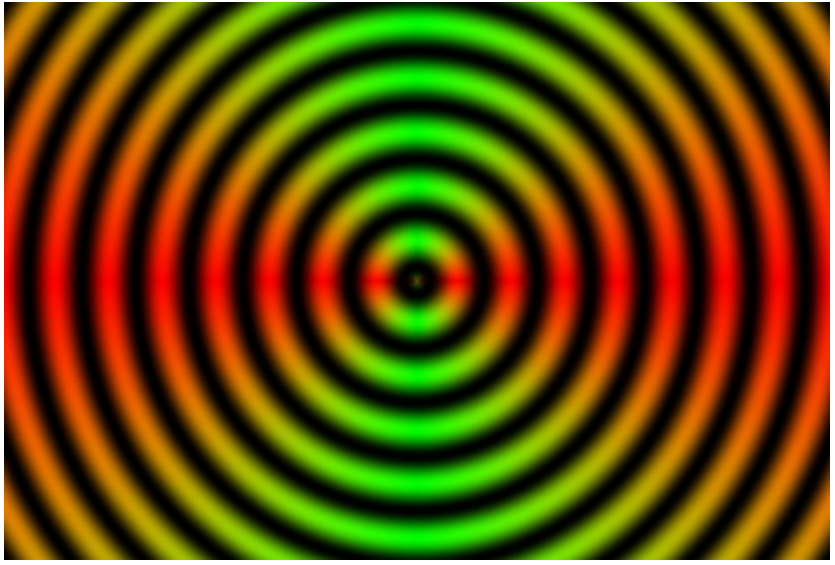
http://tavmjong.free.fr/INKSCAPE/MANUAL/html/Filters-Pixel.html

feDiffuseLighting



http://tavmjong.free.fr/INKSCAPE/MANUAL/html/Filters-Lighting.html

feDisplacementMap



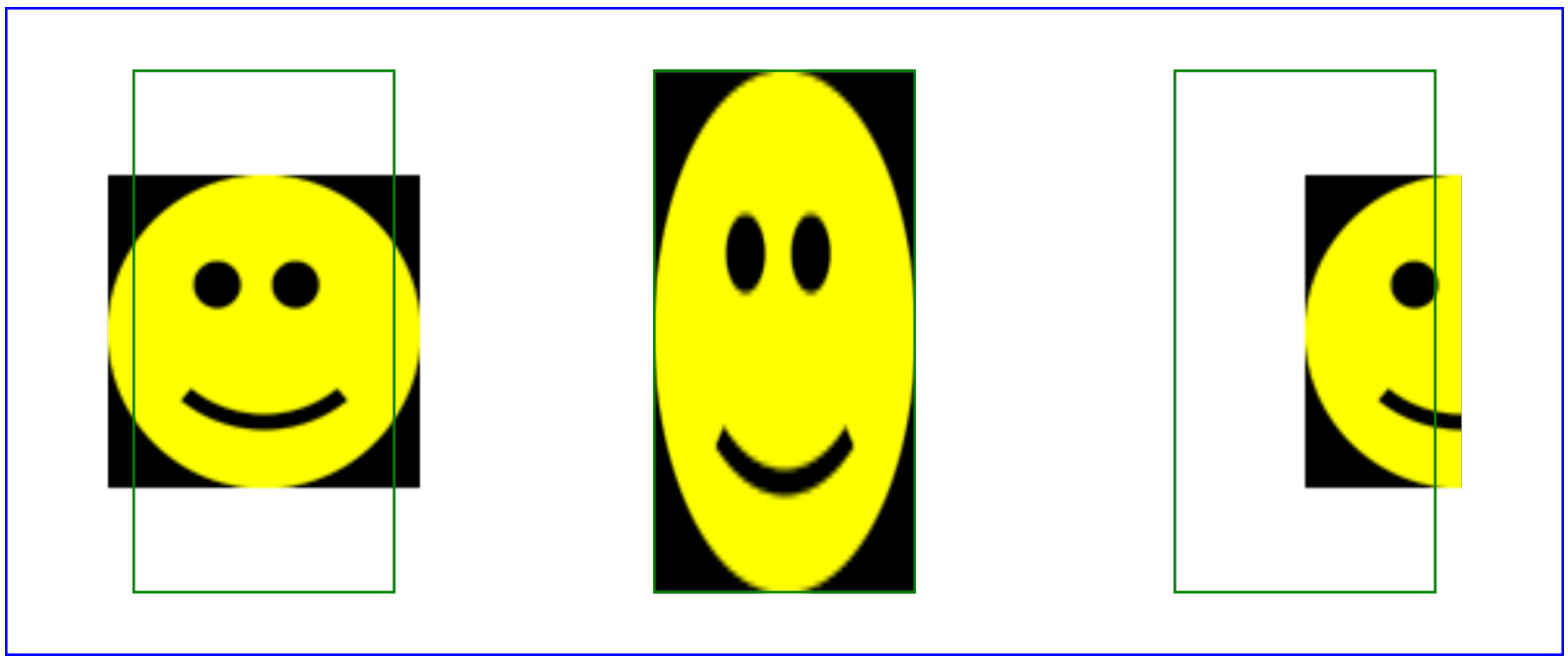
http://tavmjong.free.fr/INKSCAPE/MANUAL/html/Filters-Pixel.html

feFlood

feGaussianBlur

https://www.w3.org/TR/SVG11/filters.html

feImage



https://www.w3.org/TR/SVG11/filters.html

feMerge

https://www.w3.org/TR/SVG11/filters.html

feMorphology

https://www.w3.org/TR/SVG11/filters.html

feOffset

https://www.w3.org/TR/SVG11/filters.html

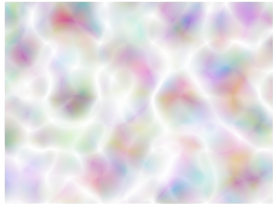
feSpecularLighting

https://www.w3.org/TR/SVG11/filters.html

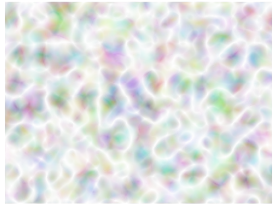
feTile

https://www.smashingmagazine.com/2015/05/why-the-svg-filter-is-awesome/

feTurbulence



type=turbulence
baseFrequency=0.05
numOctaves=2

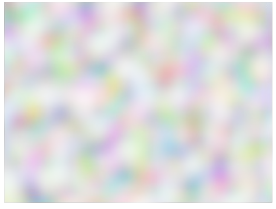


type=turbulence
baseFrequency=0.1
numOctaves=2

type=turbulence
baseFrequency=0.05
numOctaves=8

type=fractalNoise
baseFrequency=0.1
numOctaves=4

type=fractalNoise
baseFrequency=0.4
numOctaves=4



type=fractalNoise
baseFrequency=0.1
numOctaves=1

GRASS

Filter Editor

Filter	#
Blur BG Text Thin	1
Blur BG Text Lighten Edge	1
Blur BG Text Lighten	1
Blur BG Text	1
Background Blur	1

New

Effect | Connections

Gaussian Blur

Source Graphic
Source Alpha
Background Image
Background Alpha
Fill Paint
Stroke Paint

Add Effect: Blend

The **feBlend** filter primitive

Effect parameters | Filter General Settings

Standard Deviation: 4.00 4.00 Link

Filter Editor

Filter	#
Blur BG Text Thin	1
Blur BG Text Lighten Edge	1
Blur BG Text Lighten	1
Blur BG Text	1
Background Blur	1

New

Effect | Connections

Gaussian Blur

Composite

Source Graphic
Source Alpha
Background Image
Background Alpha
Fill Paint
Stroke Paint

Add Effect: Blend

The **feBlend** filter primitive

Effect parameters | Filter General Settings

Operator: In

K1: 0.00

K2: 0.00

K3: 0.00

K4: 0.00

GRASS

Filter Editor

Filter	#
Blur BG Text Thin	1
Blur BG Text Lighten Edge	1
Blur BG Text Lighten	1
Blur BG Text	1
Background Blur	1

New

Effect | Connections

Gaussian Blur
Composite
Blend

Stroke Paint
Fill Paint
Background Alpha
Background Image
Source Alpha
Source Graphic

Add Effect: Blend

The **feBlend** filter primitive

Effect parameters | Filter General Settings

Mode: Overlay

GRASS

Filter Editor

Filter	#
Blur BG Text Thin	1
Blur BG Text Lighten Edge	1
Blur BG Text Lighten	1
Blur BG Text	1
Background Blur	1

New

Effect | Connections

Gaussian Blur
Composite
Blend
Convolve Matrix
Blend

Source Graphic
Source Alpha
Background Image
Background Alpha
Fill Paint
Stroke Paint

Add Effect: Blend

The **feBlend** filter primitive

Effect parameters | Filter General Settings

Size: 3 3
Target: 0 0
Kernel:
-1.00 -1.00 -1.00
-1.00 8.00 -1.00
-1.00 -1.00 -1.00
Divisor: 0.00
Bias: 0.0
Edge Mode: Duplicate
☐ Preserve Alpha

GRASS

Filter Editor

Filter	#
Blur BG Text Thin	1
Blur BG Text Lighten Edge	1
Blur BG Text Lighten	1
Blur BG Text	1
Background Blur	1

New

Effect | Connections

Gaussian Blur
Composite
Blend
Convolve Matrix
Morphology
Blend

Source Graphic
Source Alpha
Background Image
Background Alpha
Fill Paint
Stroke Paint

Add Effect: Blend

The **feBlend** filter primitive

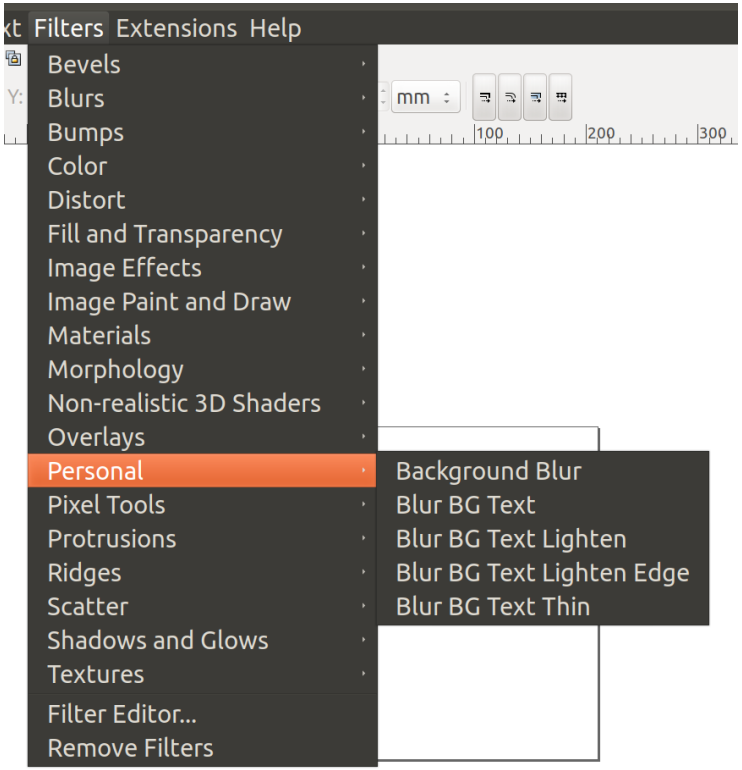
Effect parameters | Filter General Settings

Operator: Dilate

Radius: 2.0 2.0 Link

https://gould.cx/ted/presentations

```
$ mkdir -p ~/.config/inkscape/filters/
$ cp grass.svg ~/.config/inkscape/filters/
```



What next?

This is the ‘filters.svg’ in the examples directory that ships with Inkscape

Further Information

- SVG Specification

  https://www.w3.org/TR/SVG11/filters.html

- The Art of SVG Filters

  https://www.smashingmagazine.com/2015/05/why-the-svg-filter-is-awesome/

- Tav's Book of Inkscape on Filters

  http://tavmjong.free.fr/INKSCAPE/MANUAL/html/Filters.html

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