



# Extending Inkscape with SVG Filters

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<https://gould.cx/ted/presentations>

# SVG Filters

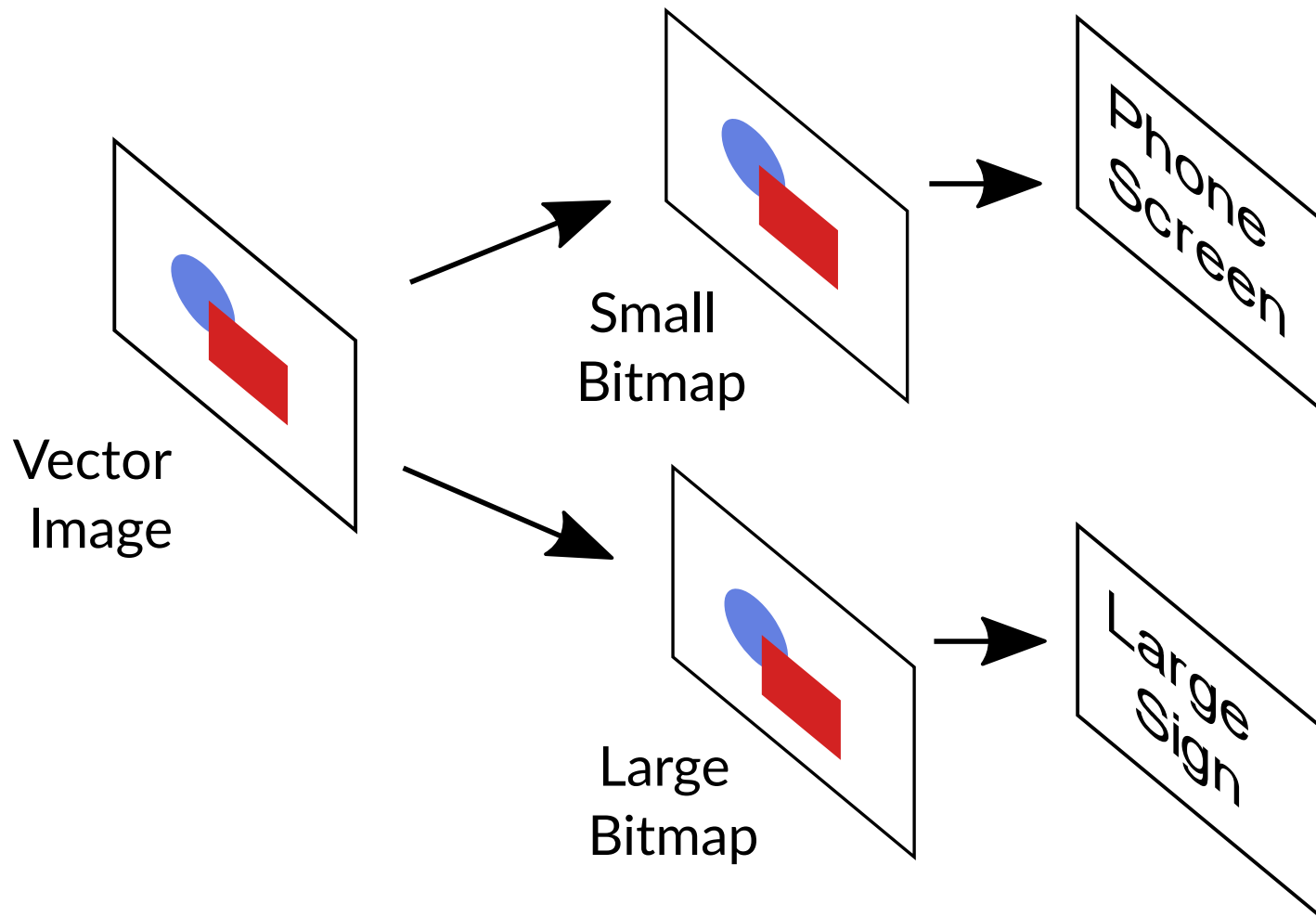
- Part of the SVG spec since 1.0
- Provides a way to modify the render pipeline of graphics application to modify the interim bitmaps
- Allows artist to do creative effects that are typically associated with bitmap editors (GIMP, Photoshop, etc.)
- Can be a powerful way to keep common design elements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



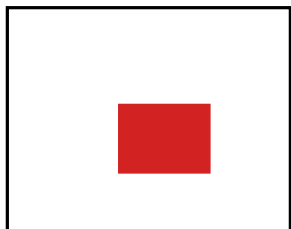
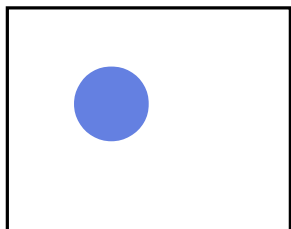
Traditional Vector  
Graphics



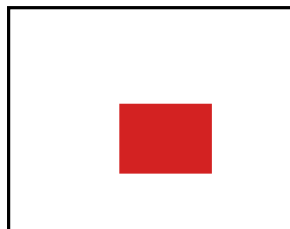
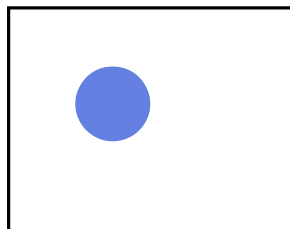
Filters and Gradients  
Vector Graphics





Vector  
Object

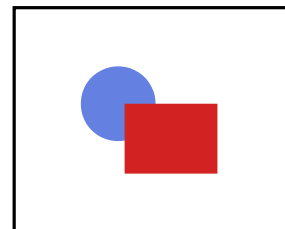
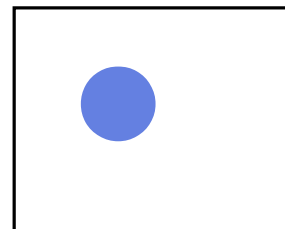


Rendered  
Bitmap

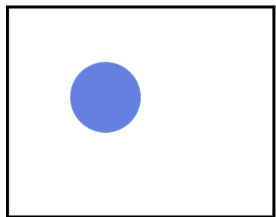


Add  


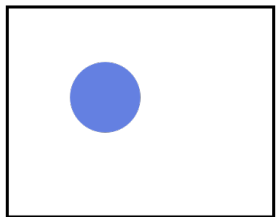
Add  




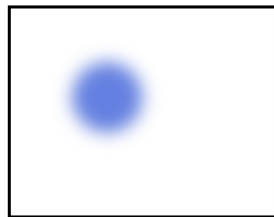
Vector  
Object



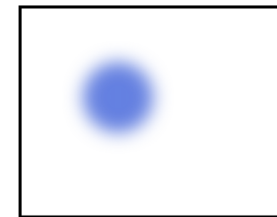
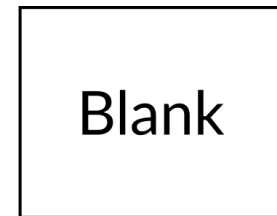
Rendered  
Bitmap



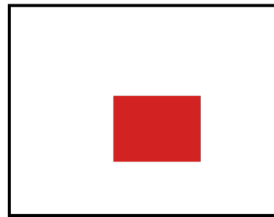
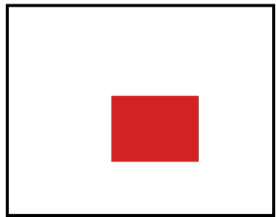
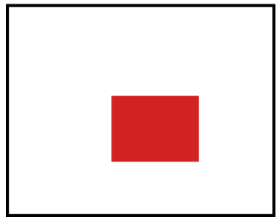
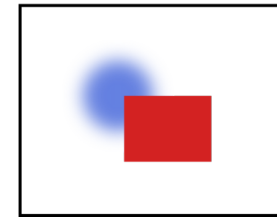
Filtered  
Bitmap



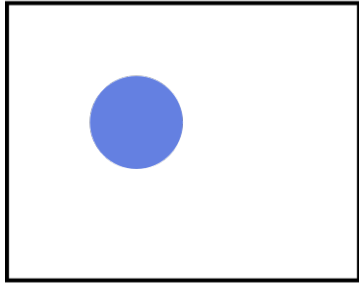
Add



Add



Input  
Bitmap

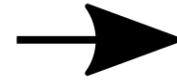


Blur

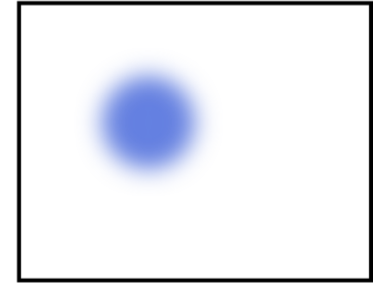
Standard  
Deviation

X: 25.0

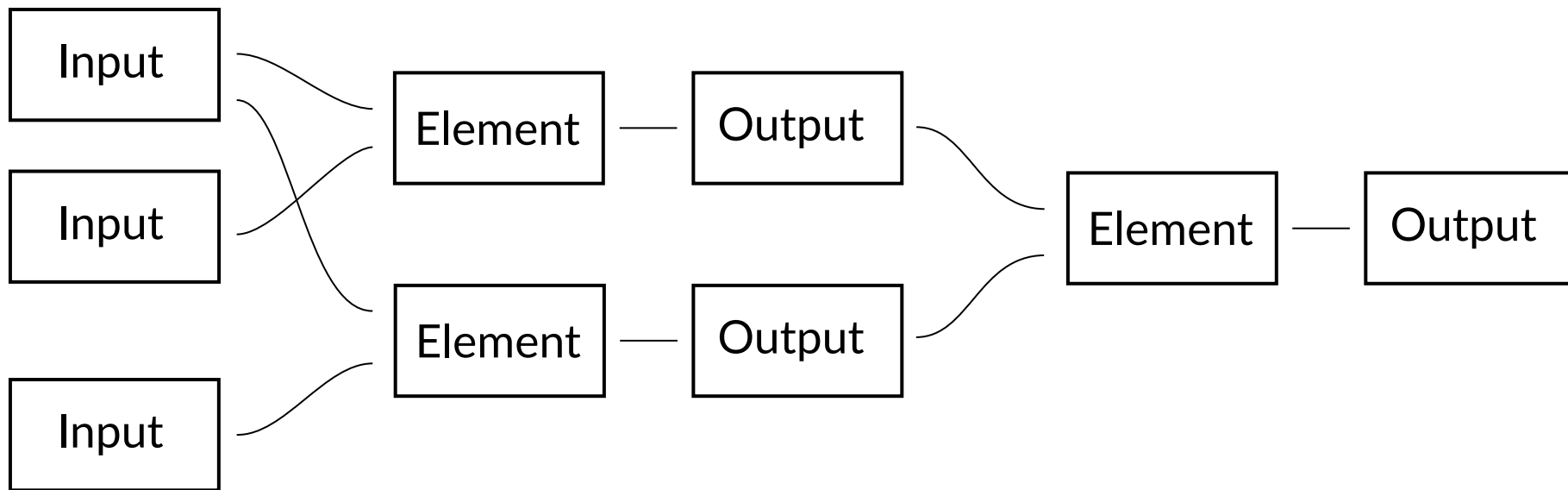
Y: 25.0



Output  
Bitmap

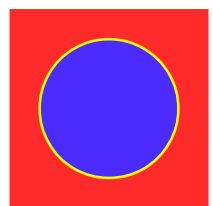


# Multiple SVG Filter Elements as a graph

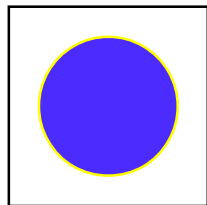




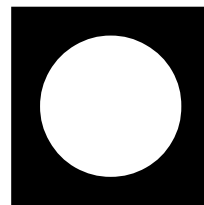
# SVG Filter Element Inputs



Source Graphic  
Filter on Blue Circle



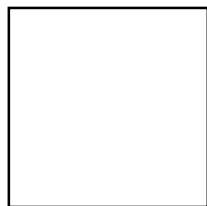
Source  
Image



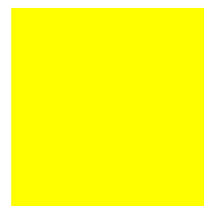
Source  
Alpha



Background



Background  
Alpha

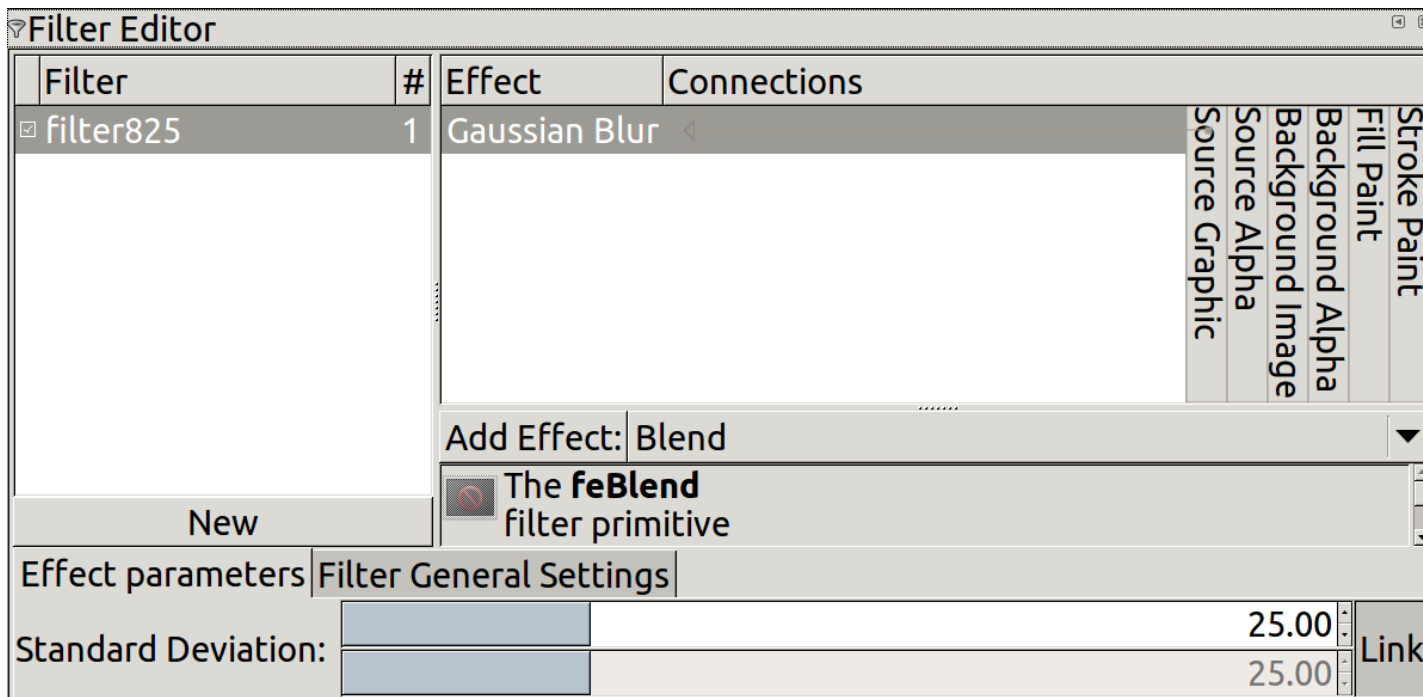


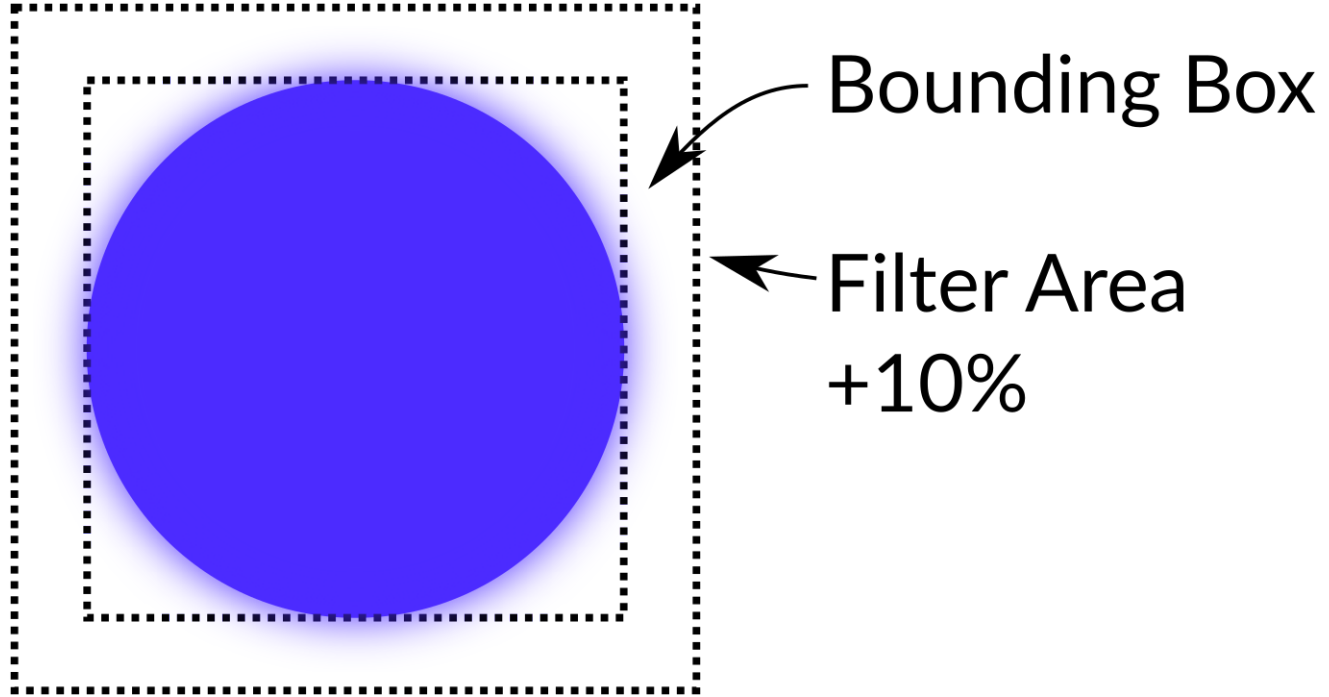
Stroke  
Color

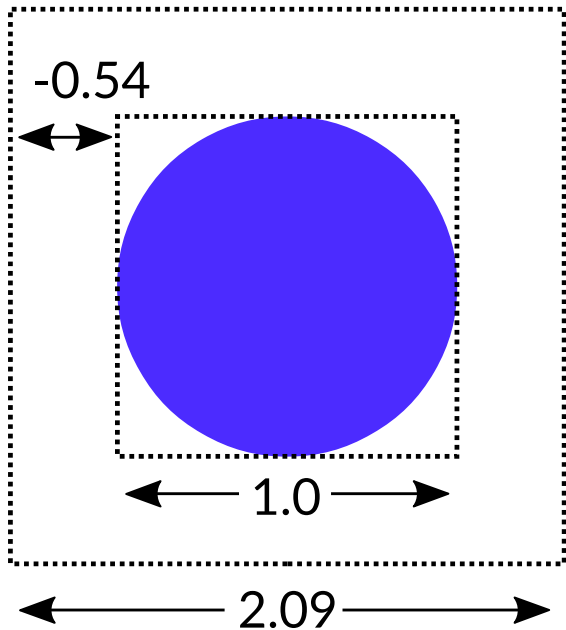


Fill  
Color

# Inkscape Filter Dialog







### Filter Editor

Filter	#	Effect	Connections
<input checked="" type="checkbox"/> filter825	1	Gaussian Blur	Stroke Paint Fill Paint Background Alpha Background Image Source Alpha Source Graphic

Add Effect: Blend

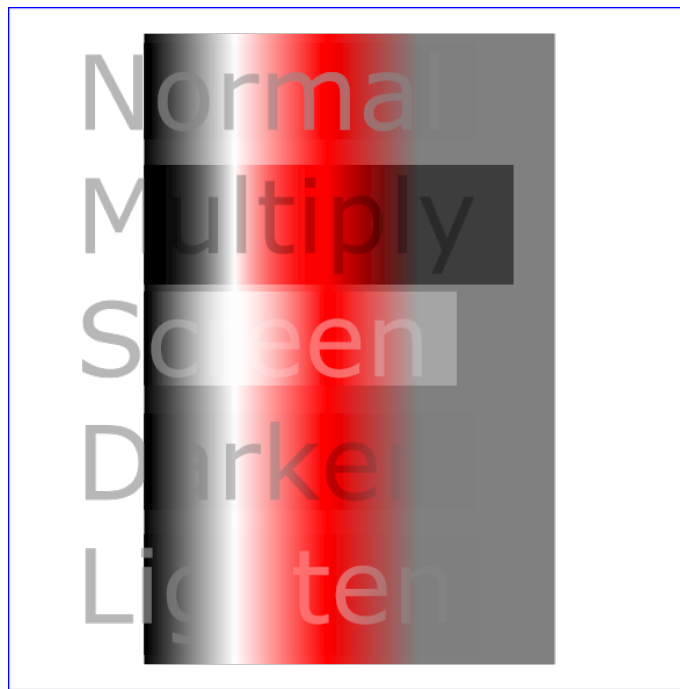
The **feBlend** filter primitive

Effect parameters | Filter General Settings

Coordinates:

Dimensions:

# feBlend



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

# feColorMatrix



**Unfiltered**

Matrix

**Saturate**

**HueRotate**

Luminance

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

# feComponentTransfer



**Identity**

**TableLookup**

**LinearFunc**

**GammaFunc**

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

# feComposite

opacity 1.0  
(without feFlood)



opacity 0.5  
(without feFlood)



over in out atop xor arithmetic

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

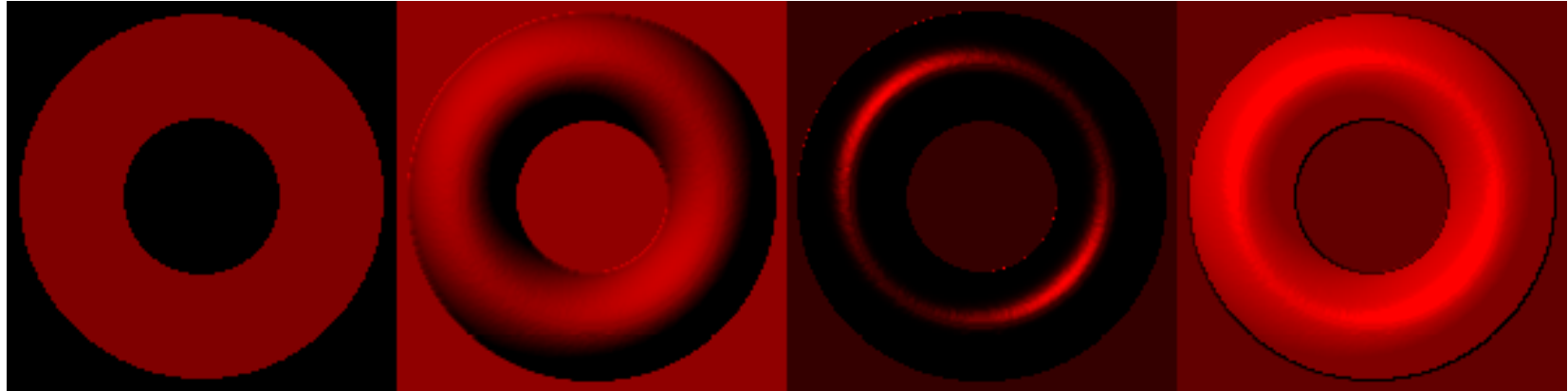


# feConvolveMatrix



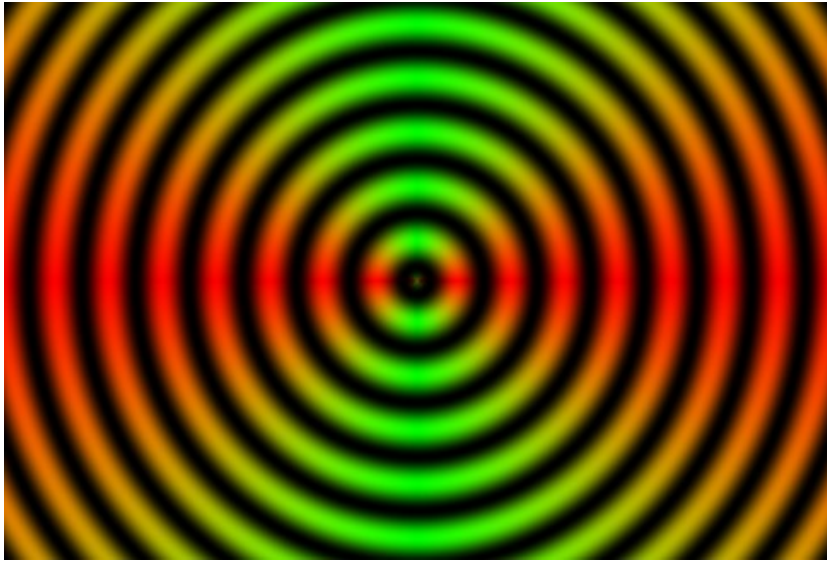
<http://tavmjong.free.fr/INKSCAPE/MANUAL/html/Filters-Pixel.html>

# feDiffuseLighting



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

# feDisplacementMap



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

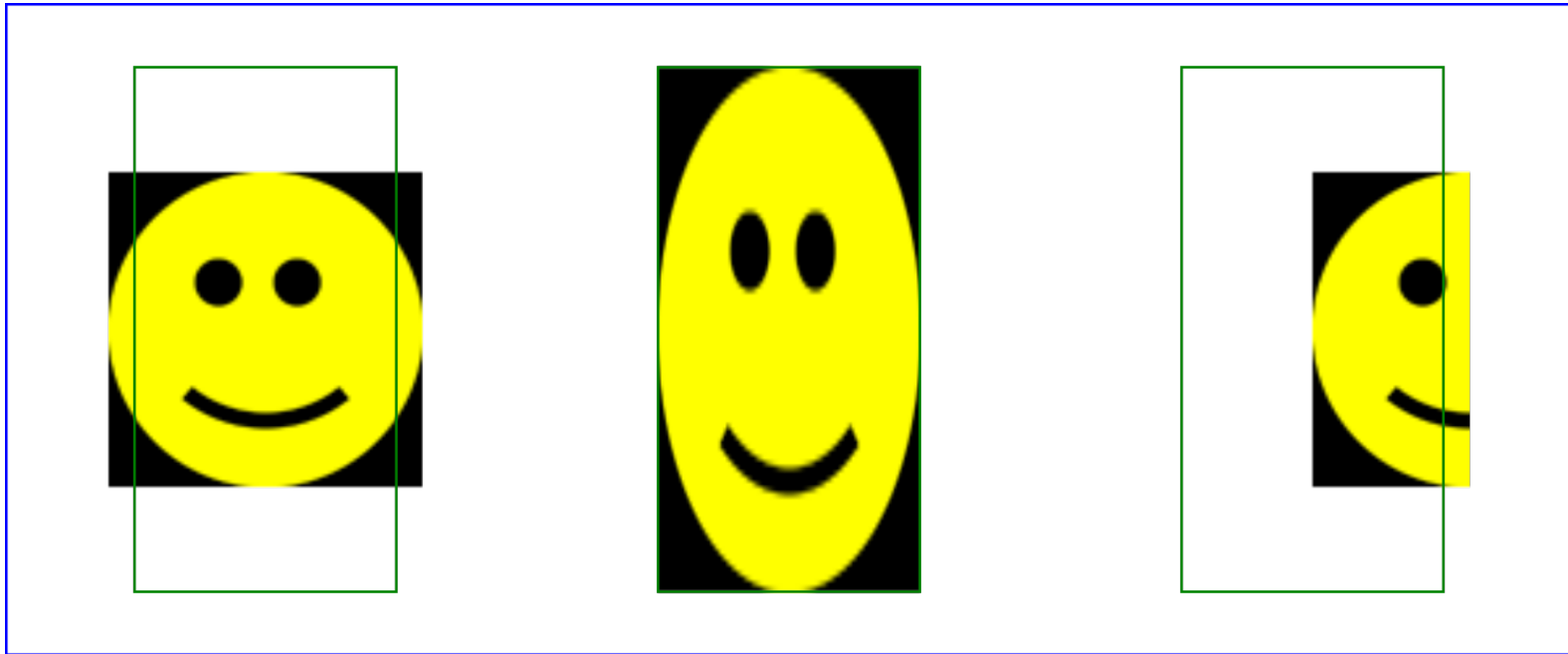
feFlood

# feGaussianBlur



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

felimage



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

feMerge



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

# feMorphology

**Unfiltered**  
**Erode radius 3**  
Erode radius 6  
**Dilate radius 3**  
**Dilate radius 6**

<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

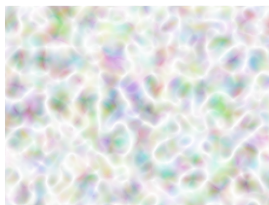
**STRIPES!**

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

# feTurbulence



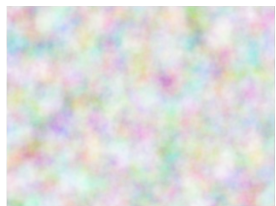
type=turbulence  
baseFrequency=0.05  
numOctaves=2



type=turbulence  
baseFrequency=0.1  
numOctaves=2



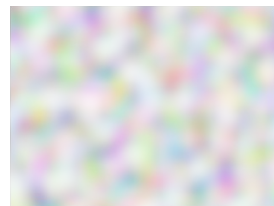
type=turbulence  
baseFrequency=0.05  
numOctaves=8



type=fractalNoise  
baseFrequency=0.1  
numOctaves=4



type=fractalNoise  
baseFrequency=0.4  
numOctaves=4



type=fractalNoise  
baseFrequency=0.1  
numOctaves=1



A close-up, top-down view of a lush, green grassy field. The grass blades are densely packed and show a vibrant green color with some natural texture and slight variations in shade. Overlaid in the center of the image is the word "GRASS" in a large, bold, white, sans-serif font. The letters are thick and have a slight shadow, making them stand out prominently against the green background.

**GRASS**





### Filter Editor

Filter	#	Effect	Connections
<input type="checkbox"/> Blur BG Text Thin	1	Gaussian Blur	Stroke Paint
<input type="checkbox"/> Blur BG Text Lighten Edge	1		Fill Paint
<input type="checkbox"/> Blur BG Text Lighten	1		Background Alpha
<input type="checkbox"/> Blur BG Text	1		Background Image
<input type="checkbox"/> Background Blur	1		Source Alpha
			Source Graphic

Add Effect: Blend

The **feBlend** filter primitive

Effect parameters | Filter General Settings

Standard Deviation:   [Link](#)







### Filter Editor

Filter	#	Effect	Connections
<input type="checkbox"/> Blur BG Text Thin	1	Gaussian Blur	Stroke Paint
<input type="checkbox"/> Blur BG Text Lighten Edge	1	Composite	Fill Paint
<input type="checkbox"/> Blur BG Text Lighten	1		Background Alpha
<input checked="" type="checkbox"/> Blur BG Text	1		Background Image
<input type="checkbox"/> Background Blur	1		Source Alpha
			Source Graphic

Add Effect: Blend

The **feBlend** filter primitive

New

Effect parameters | Filter General Settings

Operator: In

K1:	<input type="text"/>	0.00
K2:	<input type="text"/>	0.00
K3:	<input type="text"/>	0.00
K4:	<input type="text"/>	0.00

A close-up, top-down view of a dense field of vibrant green grass. The blades are long and narrow, creating a textured, repetitive pattern across the entire frame. The lighting is bright and even, highlighting the natural green color of the grass. In the center of the image, the word "GRASS" is written in large, bold, white, sans-serif capital letters. The text is semi-transparent, allowing the green of the grass to be visible through the letters, creating a layered effect.

GRASS



### Filter Editor

Filter	#	Effect	Connections
<input type="checkbox"/> Blur BG Text Thin	1	Gaussian Blur	
<input type="checkbox"/> Blur BG Text Lighten Edge	1	Composite	
<input checked="" type="checkbox"/> Blur BG Text Lighten	1	Blend	
<input type="checkbox"/> Blur BG Text	1		
<input type="checkbox"/> Background Blur	1		

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

A close-up, top-down view of a lush, green grassy field. The grass blades are densely packed and show varying shades of green, from bright lime to deep forest green. The word "GRASS" is superimposed in the center of the image in a large, bold, sans-serif font. The letters are white with a semi-transparent effect, allowing the green of the grass to be visible through them.

GRASS



### Filter Editor

Filter	#	Effect	Connections
<input type="checkbox"/> Blur BG Text Thin	1	Gaussian Blur	
<input type="checkbox"/> Blur BG Text Lighten Edge	1	Composite	
<input type="checkbox"/> Blur BG Text Lighten	1	Blend	
<input type="checkbox"/> Blur BG Text	1	Convolve Matrix	
<input type="checkbox"/> Background Blur	1	Blend	

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

A close-up photograph of a lush green lawn. The grass blades are dense and vibrant, filling the entire frame. Overlaid in the center is the word "GRASS" in a large, bold, white font with a thick black outline. The letters are slightly transparent, allowing the green of the grass to be visible through them.

GRASS



Filter Editor

Filter	#	Effect	Connections
<input type="checkbox"/> Blur BG Text Thin	1	Gaussian Blur	
<input type="checkbox"/> Blur BG Text Lighten Edge	1	Composite	
<input type="checkbox"/> Blur BG Text Lighten	1	Blend	
<input type="checkbox"/> Blur BG Text	1	Convolve Matrix	
<input type="checkbox"/> Background Blur	1	Morphology	
		Blend	

Add Effect: Blend

The **feBlend** filter primitive

Effect parameters | Filter General Settings

Operator: Dilate

Radius: 2.0

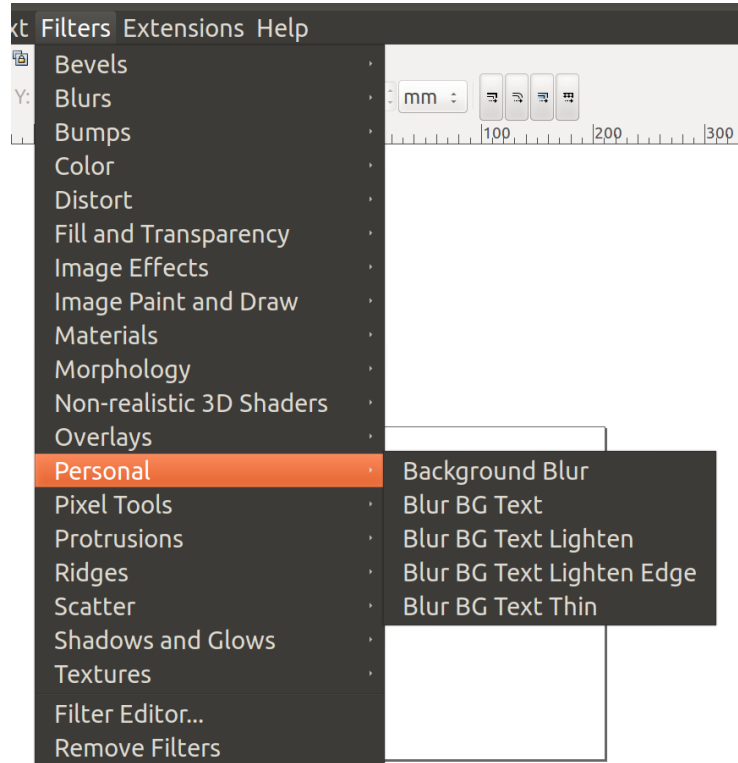
2.0 Link



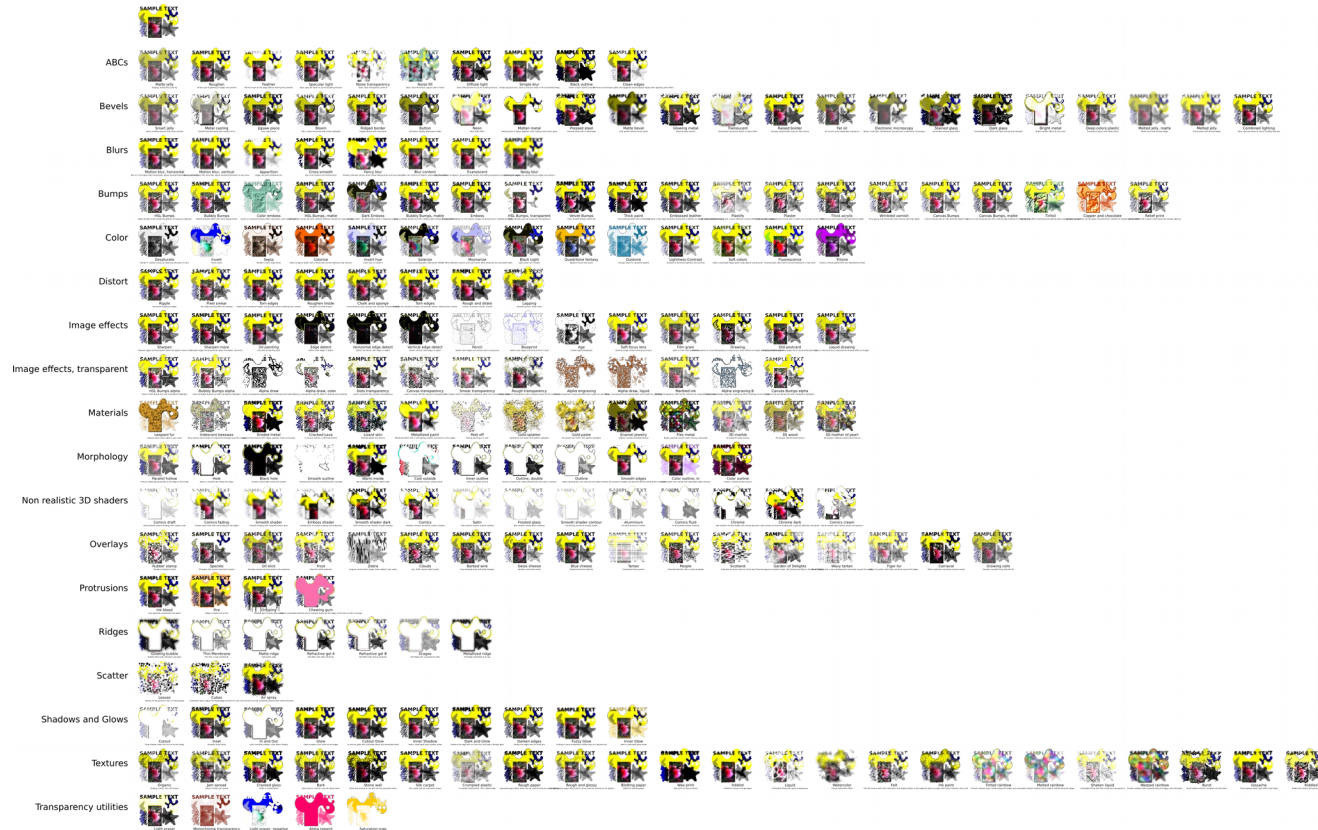


<https://gould.cx/ted/presentations>

```
$ 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>

