

x	1D Distr. [G(x)]
0	0.3989422804
1	0.2419707245
2	0.0539909665
3	0.0044318484
4	0.0001338302
5	0.0000014867
6	0.0000000061
7	0.0000000000
8	0.0000000000
9	0.0000000000
10	0.0000000000
11	0.0000000000
12	0.0000000000
13	0.0000000000
14	0.0000000000
15	0.0000000000

$$G(x) = \frac{1}{\sqrt{2\pi}\sigma} e^{-\frac{x^2}{2\sigma^2}}$$

Complexity : $O(2n)$ for n samples

x : Distance to pixel
 $G(x)$: Tap weight at distance x

Standard Deviation (σ) [for both]
1

y	2D Gaussian Distribution [G(x, y)]						
3	0.0000196413	0.0002392798	0.0010723776	0.0017680517	0.0010723776	0.0002392798	0.0000196413
2	0.0002392798	0.0029150245	0.0130642333	0.0215392793	0.0130642333	0.0029150245	0.0002392798
1	0.0010723776	0.0130642333	0.0585498315	0.0965323526	0.0585498315	0.0130642333	0.0010723776
0	0.0017680517	0.0215392793	0.0965323526	0.1591549431	0.0965323526	0.0215392793	0.0017680517
1	0.0010723776	0.0130642333	0.0585498315	0.0965323526	0.0585498315	0.0130642333	0.0010723776
2	0.0002392798	0.0029150245	0.0130642333	0.0215392793	0.0130642333	0.0029150245	0.0002392798
3	0.0000196413	0.0002392798	0.0010723776	0.0017680517	0.0010723776	0.0002392798	0.0000196413
x	3	2	1	0	1	2	3

$$G(x, y) = \frac{1}{2\pi\sigma^2} e^{-\frac{x^2+y^2}{2\sigma^2}}$$

Inner Matrix : 5x5
 Outer Matrix : 7x7

Complexity : $O(n^2)$ for n samples

Sampling Grid

1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1

9-tap, $\sigma = 2.7$

<i>Weight</i> =	0.1477564001	0.1379619424	0.1123047940	0.0797009115	0.0493121886
<i>Weight'</i> =	0.163029659	0.152222769	0.123913497	0.087939422	0.054409483
<i>Dist</i> =	0	1	2	3	4
Σ_{HBlur} =	0.9063160730	<i>AugFactor</i> = 1.103367831		$\Sigma_{\text{HBlur}'}$ = 1.0000000000	
Σ_{HVBlur} =	0.8214088242			$\Sigma_{\text{HVBlur}'}$ = 1.0000000000	

7-tap, $\sigma = 1.745$

<i>Weight</i> =	0.2286202180	0.1940003427	0.1185403173	0.0521561347
<i>Weight'</i> =	0.238639794	0.202502658	0.1237355	0.054441945
<i>Dist</i> =	0	1	2	3
Σ_{HBlur} =	0.9580138075	<i>AugFactor</i> = 1.043826292		$\Sigma_{\text{HBlur}'}$ = 1.0000000000
Σ_{HVBlur} =	0.9177904553			$\Sigma_{\text{HVBlur}'}$ = 1.0000000000

5-tap, $\sigma = 1$

<i>Weight</i> =	0.3989422804	0.2419707245	0.0539909665	
<i>Weight'</i> =	0.402619947	0.244201342	0.054488685	
<i>Dist</i> =	0	1	2	
Σ_{HBlur} =	0.9908656625	<i>AugFactor</i> = 1.009218543		$\Sigma_{\text{HBlur}'}$ = 1.0000000000
Σ_{HVBlur} =	0.9818147611			$\Sigma_{\text{HVBlur}'}$ = 1.0000000000

- Notes :**
- σ defines the blur strength (but also requires more taps)
 - Using a single dimension implies two passes; horizontally, then vertically
 - Σ_{HBlur} : The value of the sampled pixel after the first pass (horizontal)
 - Σ_{HVBlur} : The value of the sampled pixel after the second pass (vertical)
 - *AugFactor* : The inverse of Σ_{HBlur} , or how much is missing to get the expected value
 - *foo'* : *foo* with the *AugFactor* applied
 - σ are hand-tuned so that the last *Weight'* is closest to the last *Weight'* of a 5-tap for $\sigma = 1$