Detektion af vesikler i celler

Bachelorforsvar

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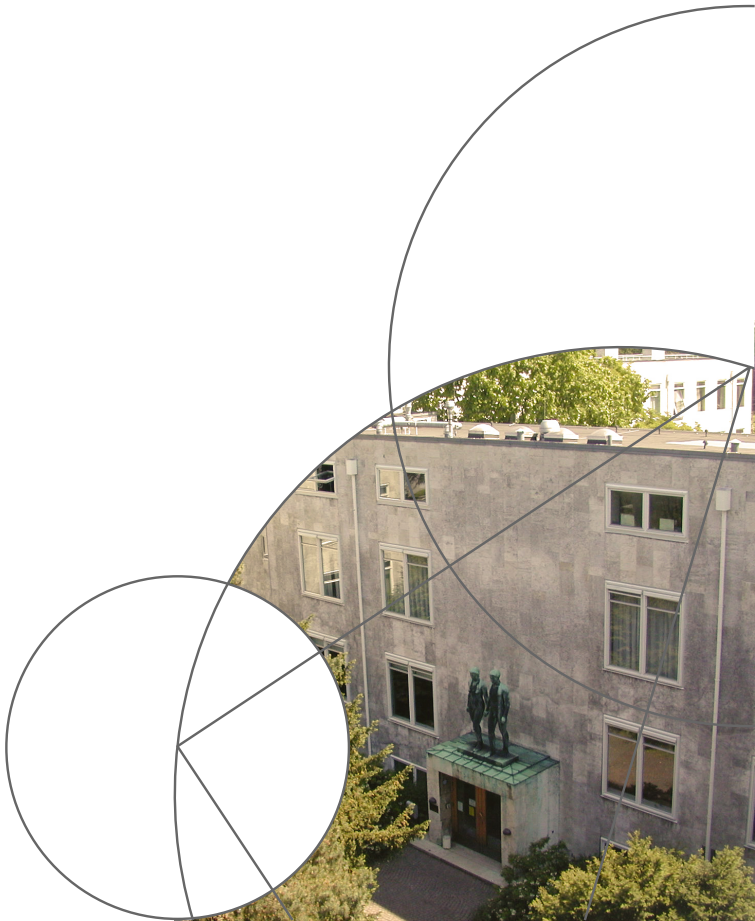
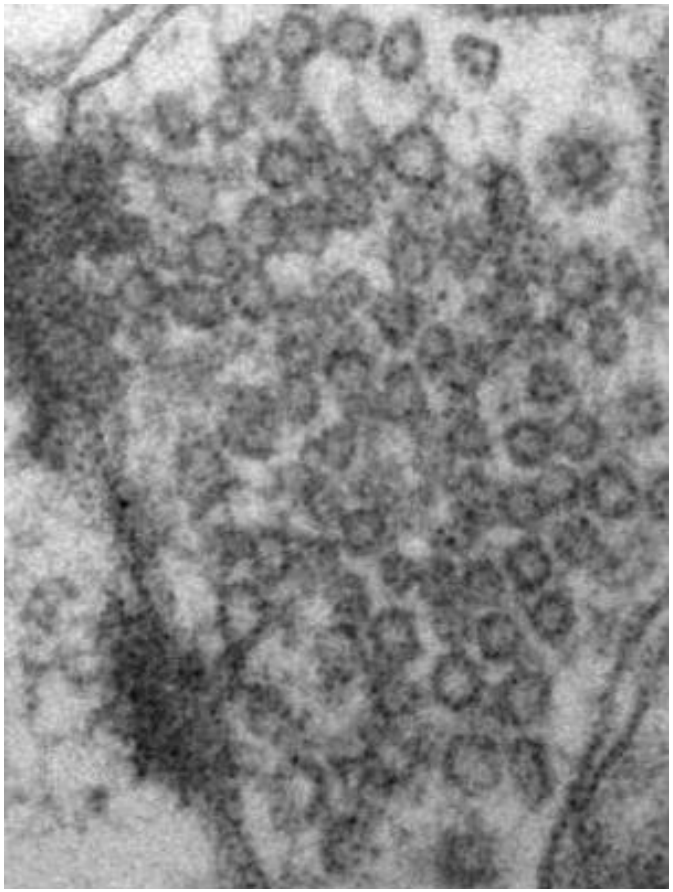
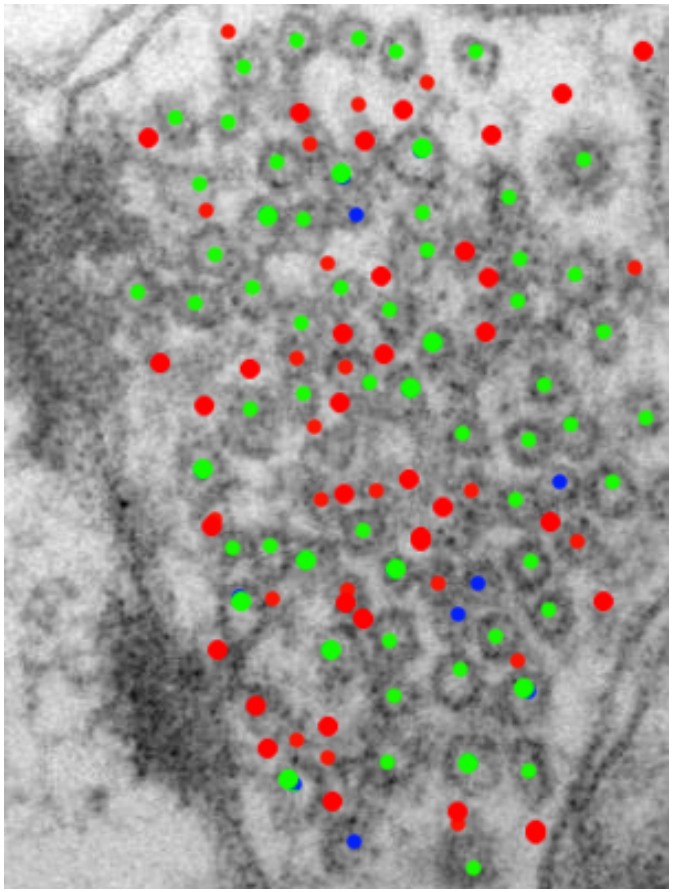
Datalogisk Institut

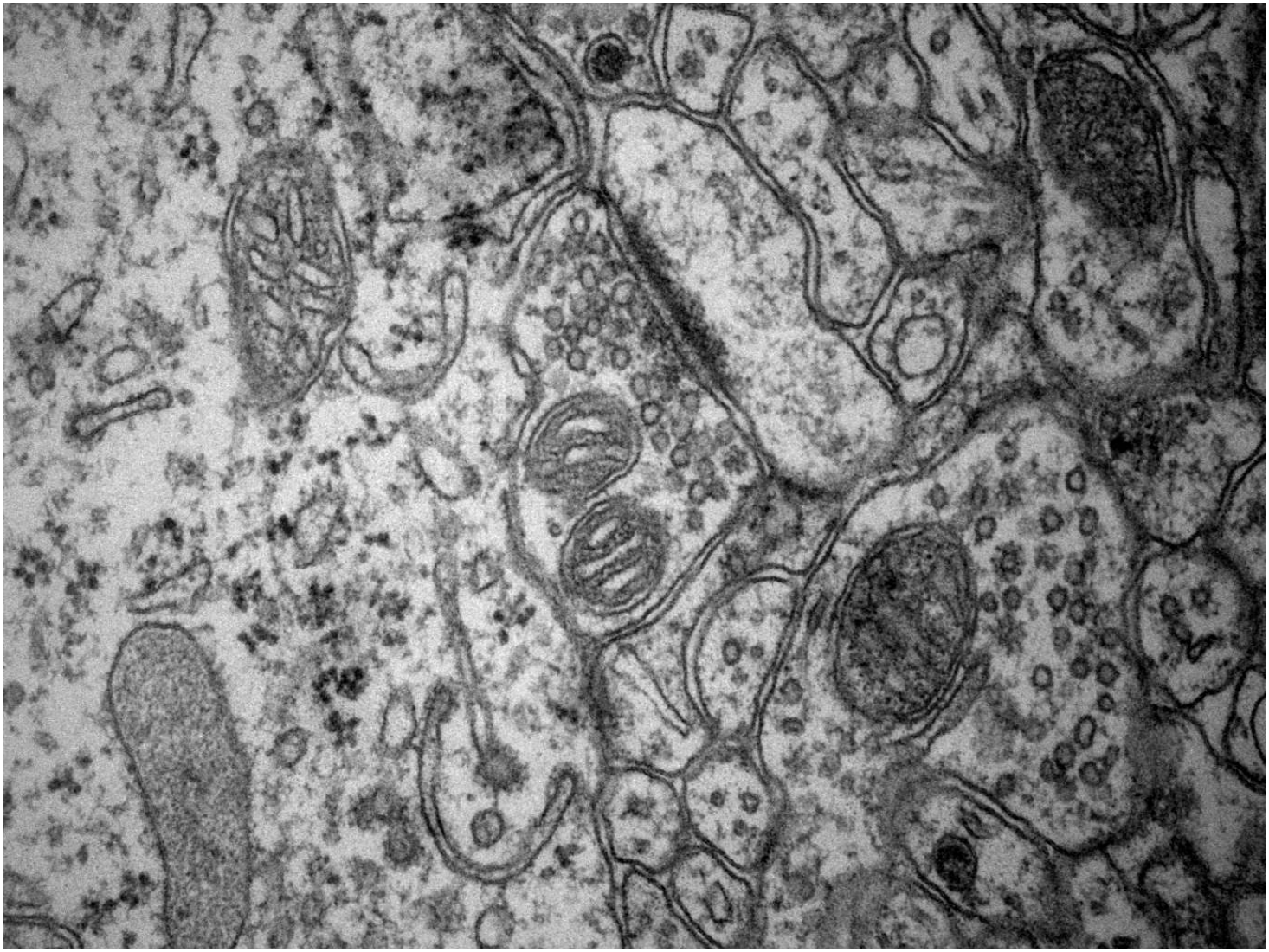


Resultatet

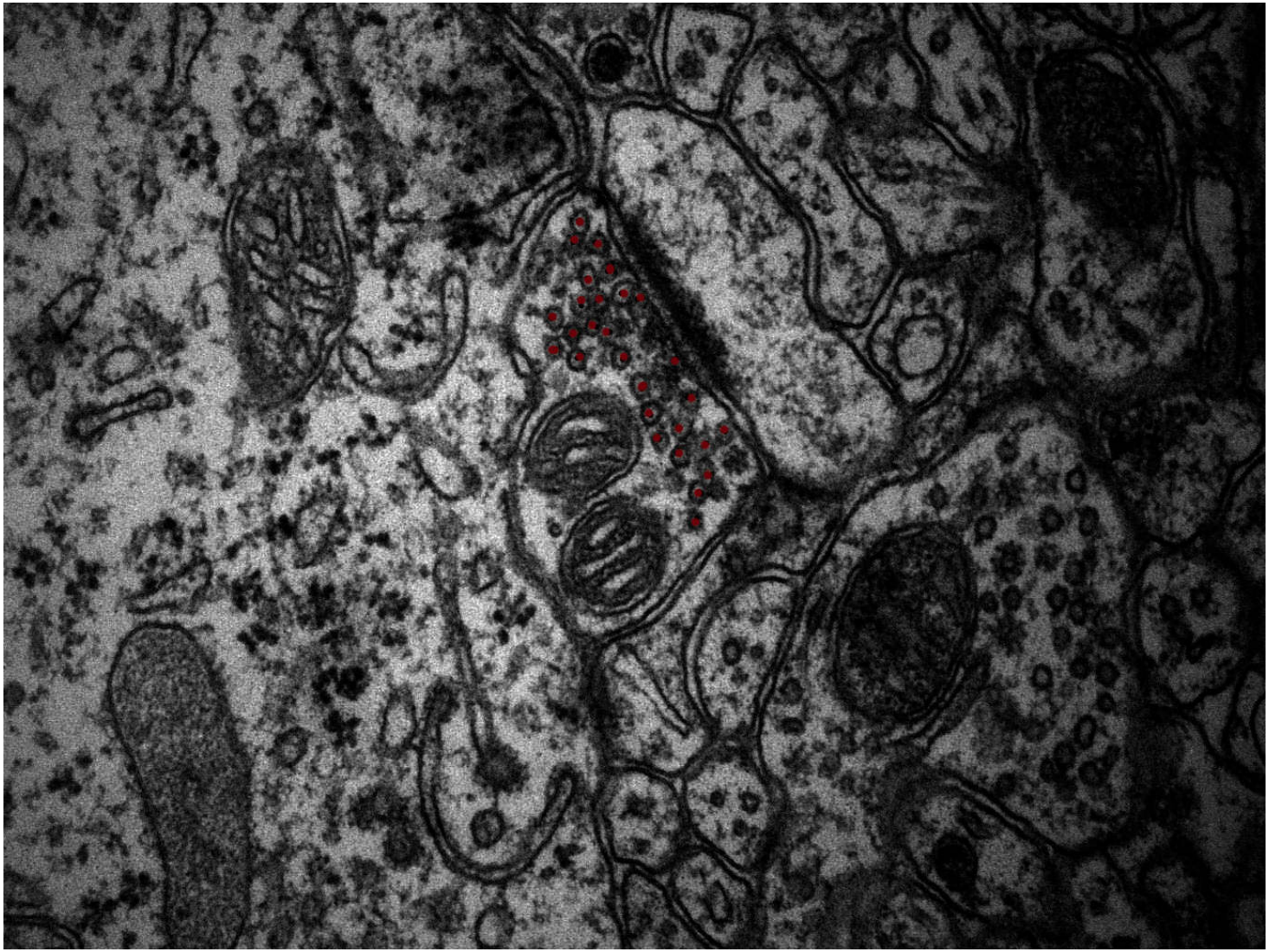




Introduktion



Introduktion



Billedbehandling - Fouriertransformation

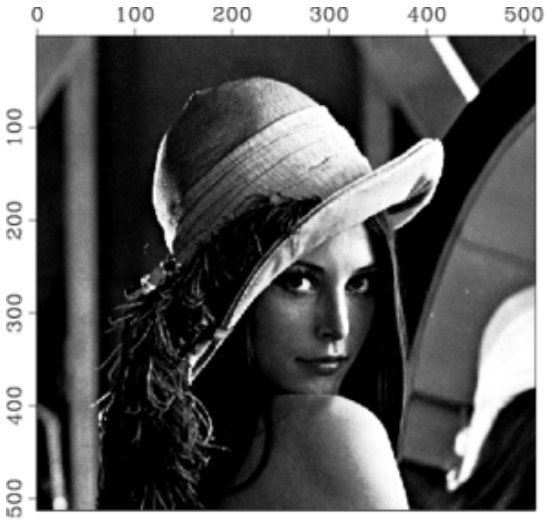
Fouriertransformation

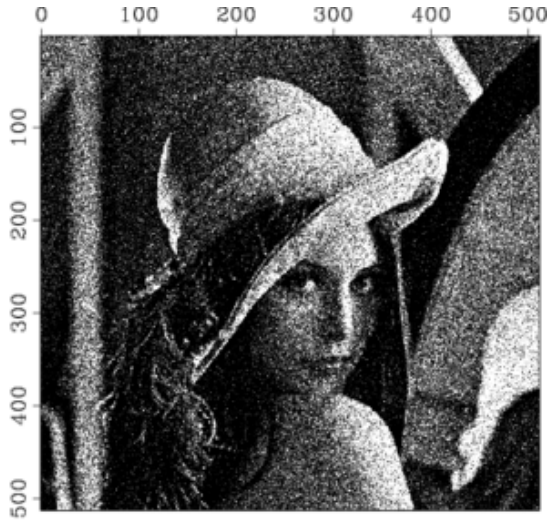
$$\hat{f}(\xi) = \int_{-\infty}^{\infty} f(x)\, e^{-2\pi i x \xi}\, dx, \quad \text{for } x \in \mathbb{R}$$

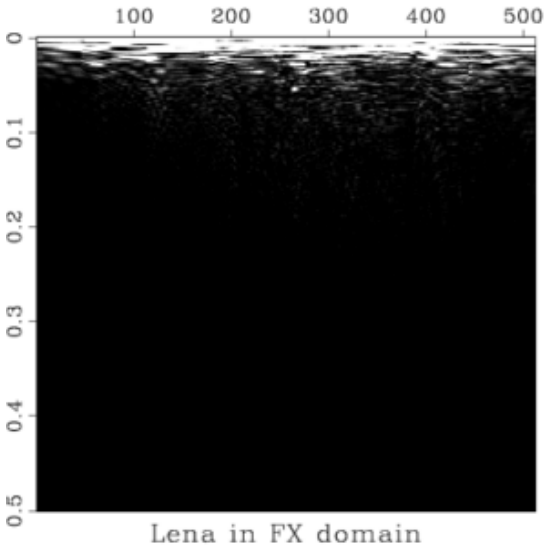
Invers fouriertransformation

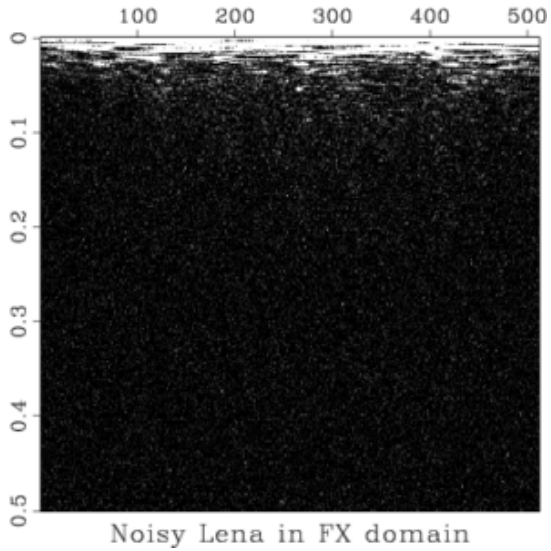
$$f(x) = \int_{-\infty}^{\infty} \hat{f}(\xi)\, e^{2\pi i x \xi}\, d\xi, \quad \text{for } x \in \mathbb{R}$$

Billedbehandling - Fouriertransformation

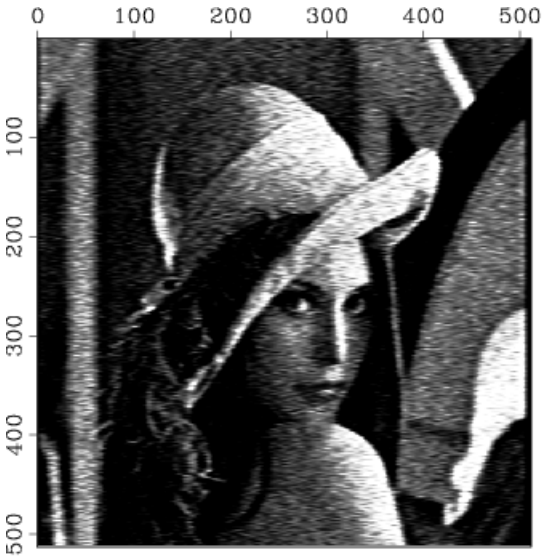




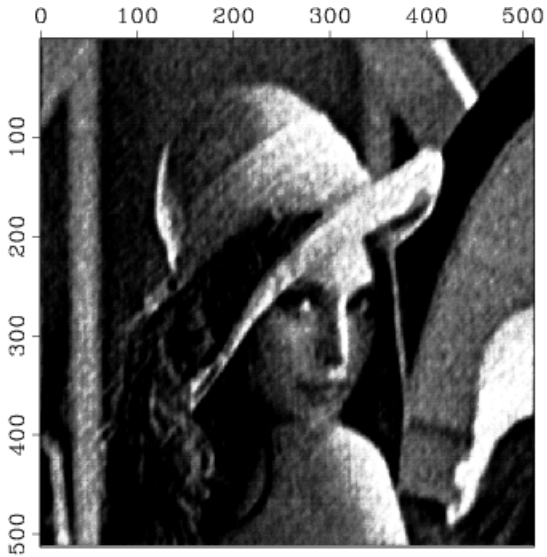




Billedbehandling - Fouriertransformation



Noisy Lena LP filtered



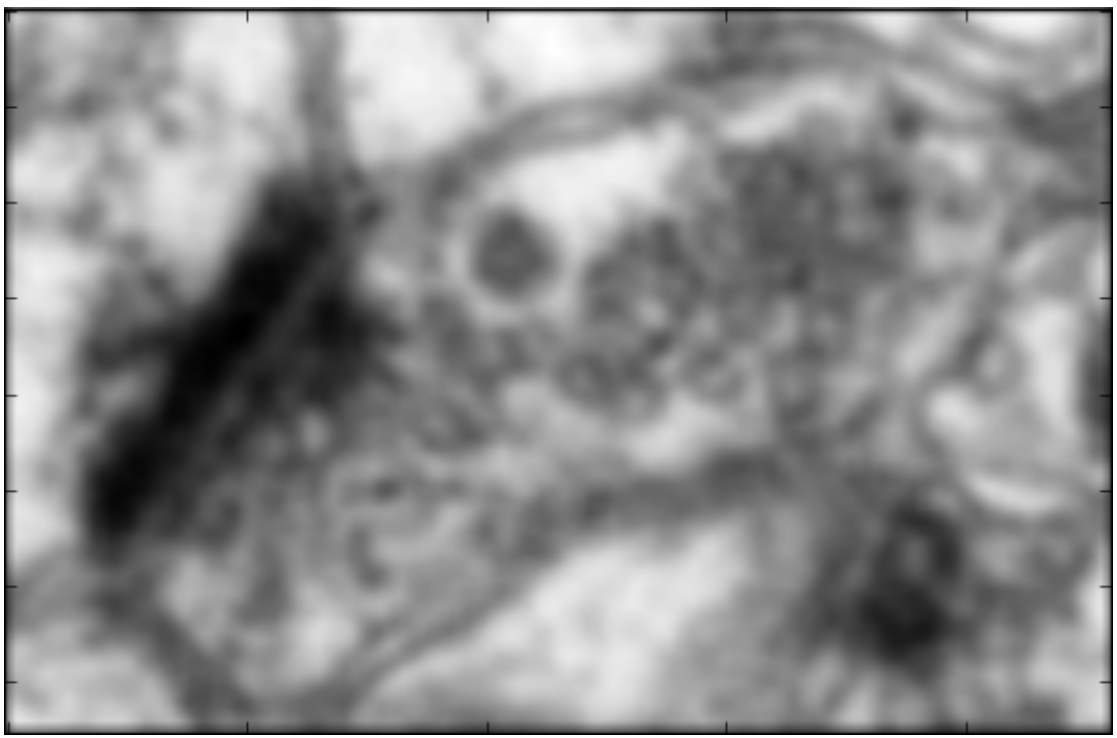
Thresholding in the Fourier domain

Billedbehandling - Foldning

$$f(t) * g(t) = \int_{-\infty}^{\infty} f(\tau)g(t-\tau)d\tau$$

Billedbehandling - Gaussisk udglatning

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

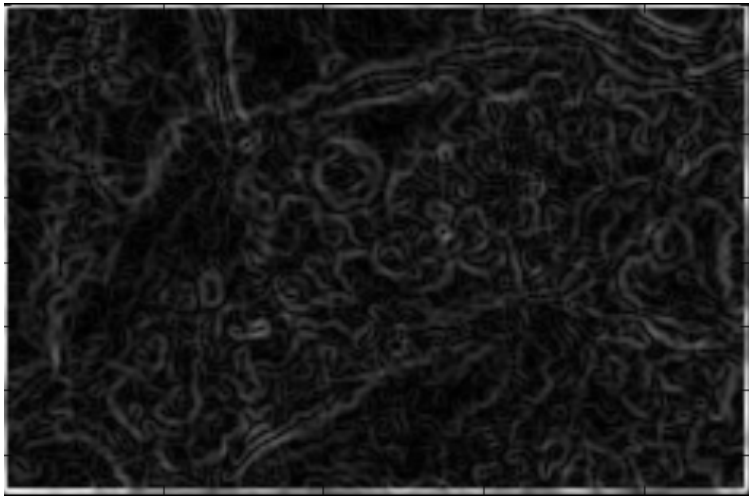


Billedbehandling - Sobelfilter

$$G_y = \begin{bmatrix} -1 & -2 & -1 \\ 0 & 0 & 0 \\ 1 & 2 & 1 \end{bmatrix} * I \qquad G_x = \begin{bmatrix} -1 & 0 & 1 \\ -2 & 0 & 2 \\ -1 & 0 & 1 \end{bmatrix} * I$$

$$G = \sqrt{G_x^2 + G_y^2} \qquad \Theta = \arctan\left(\frac{G_y}{G_x}\right)$$

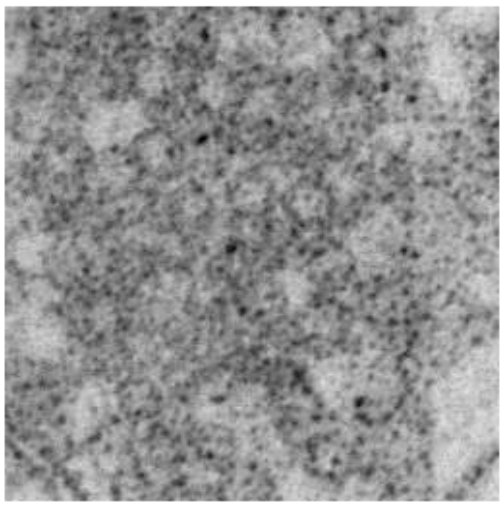
Billedbehandling - Sobelfilter



Billedbehandling - Hough-cirkeldetektion

PLACEHOLDER

Segmentering med eksempelbilleder



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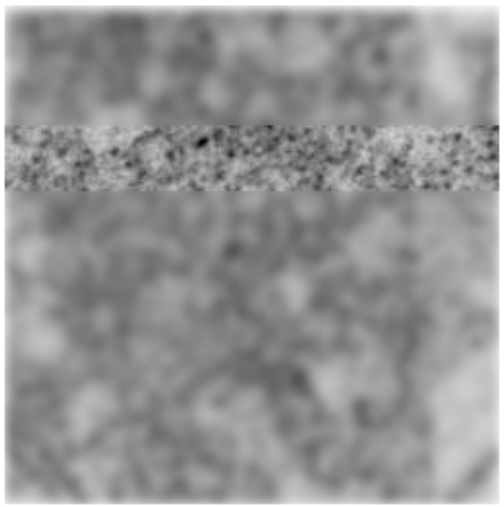

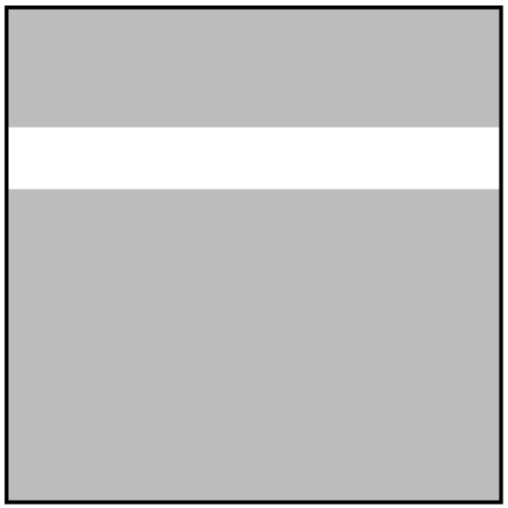

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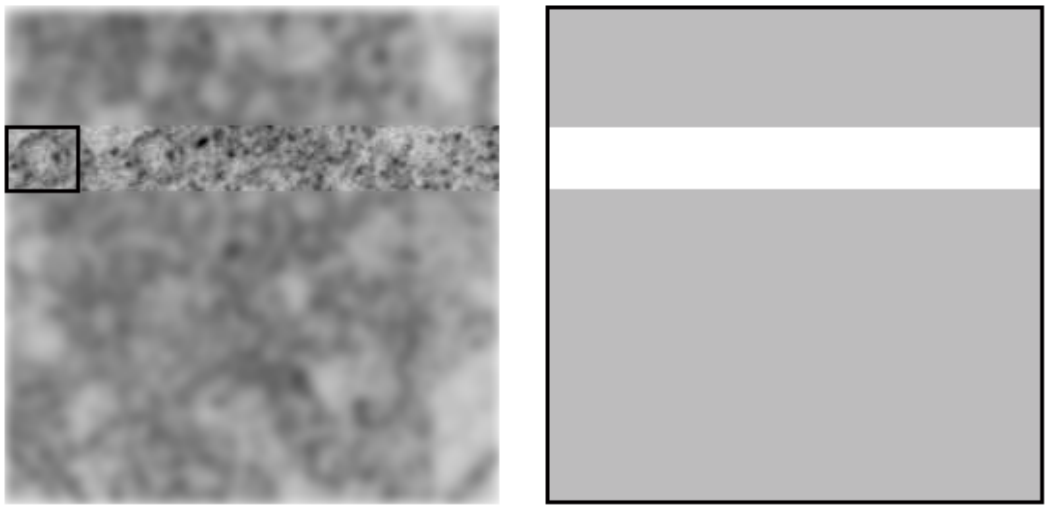

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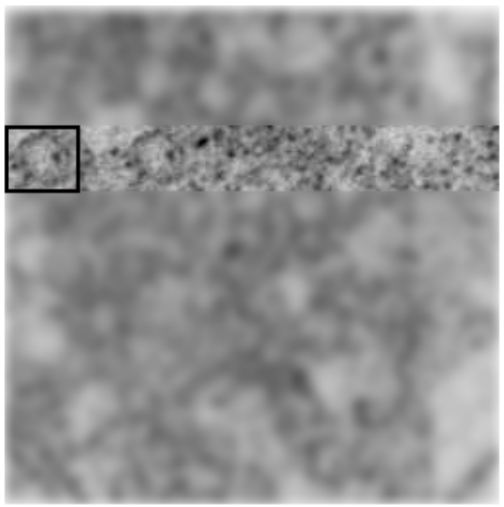

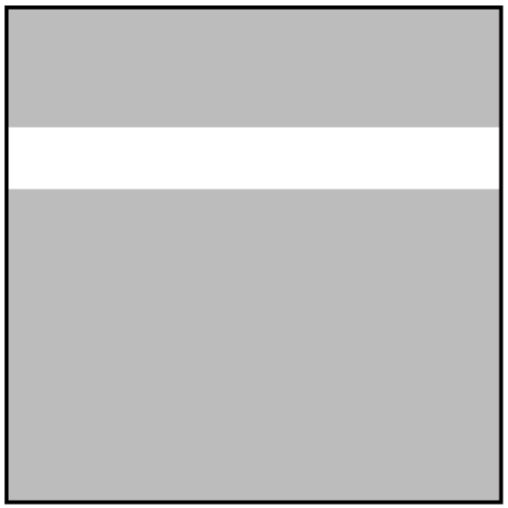

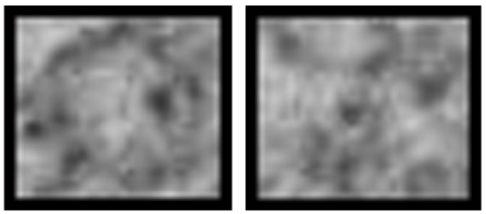

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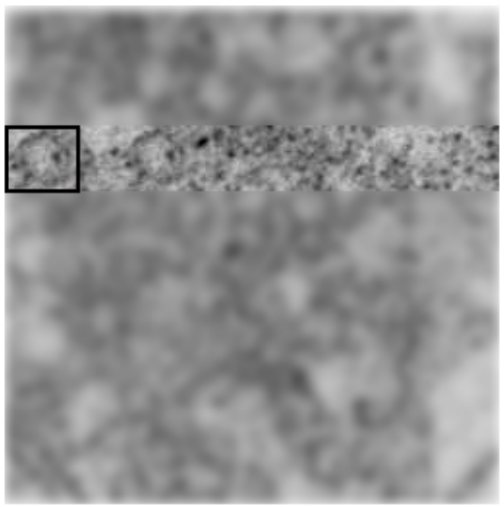

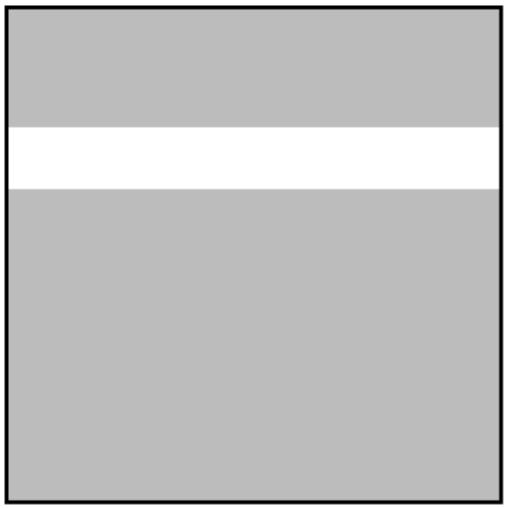

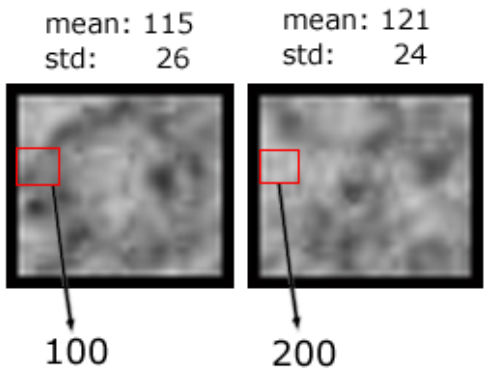

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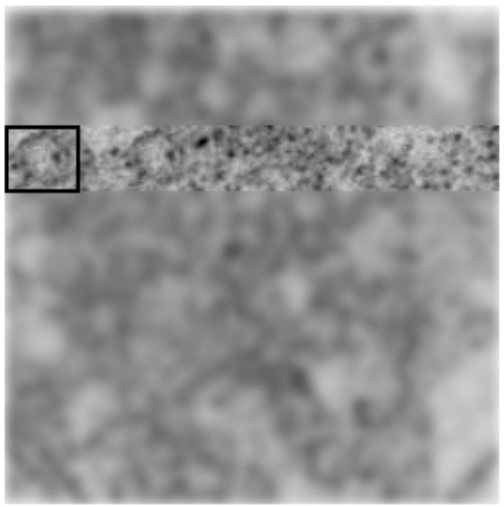
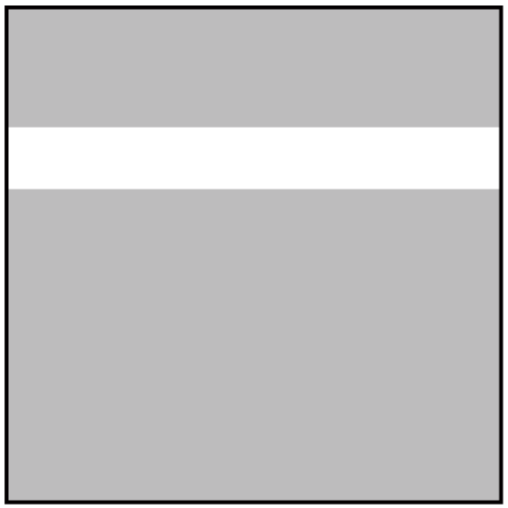
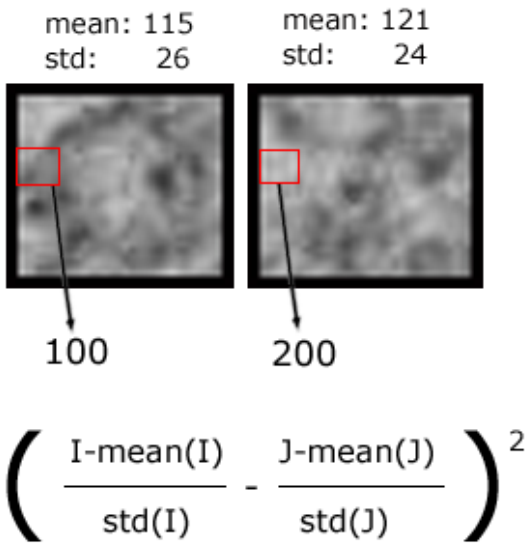
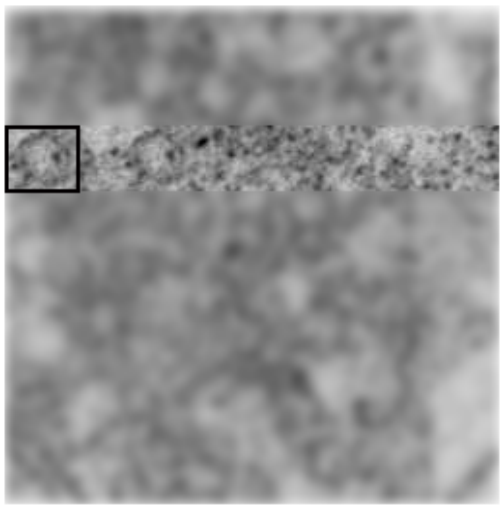


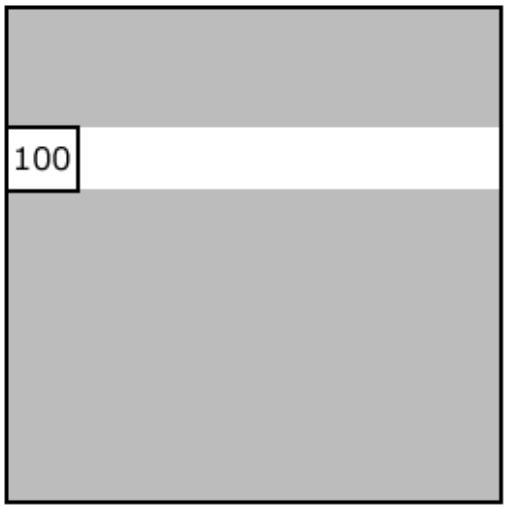


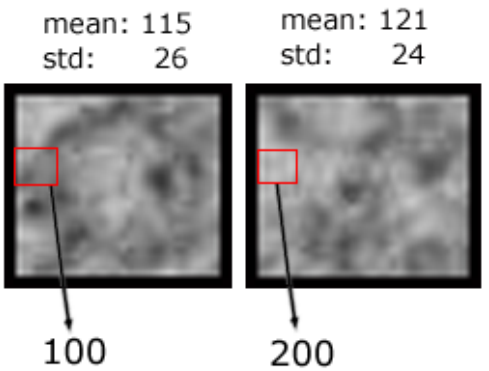


$$\left(\frac{\text{I-mean(I)}}{\text{std(I)}} - \frac{\text{J-mean(J)}}{\text{std(J)}} \right)^2$$

Segmentering med eksempelbilleder



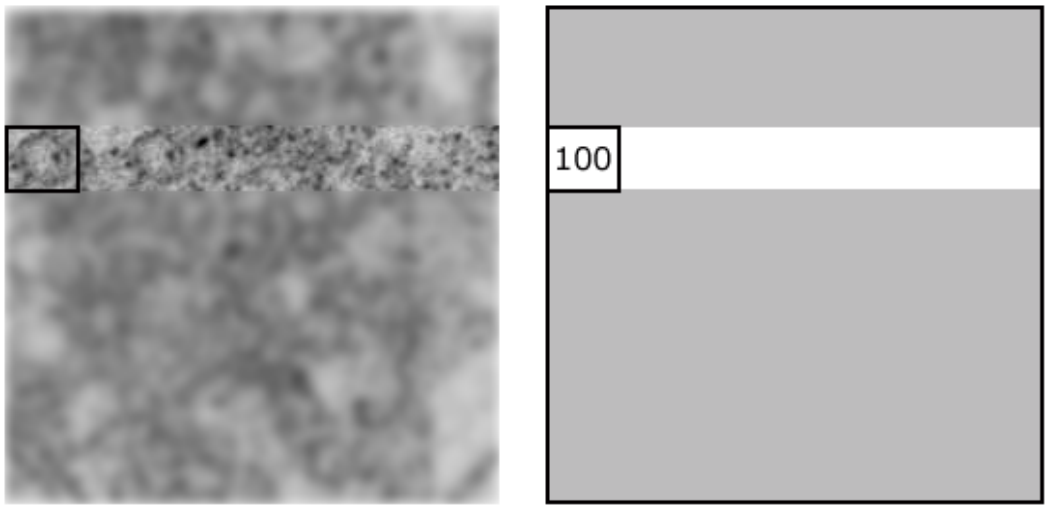




$$\left(\frac{\text{I-mean(I)}}{\text{std(I)}} - \frac{\text{J-mean(J)}}{\text{std(J)}} \right)^2$$

$$(-0.5769 - 3.2917)^2 = 15$$

Segmentering med eksempelbilleder



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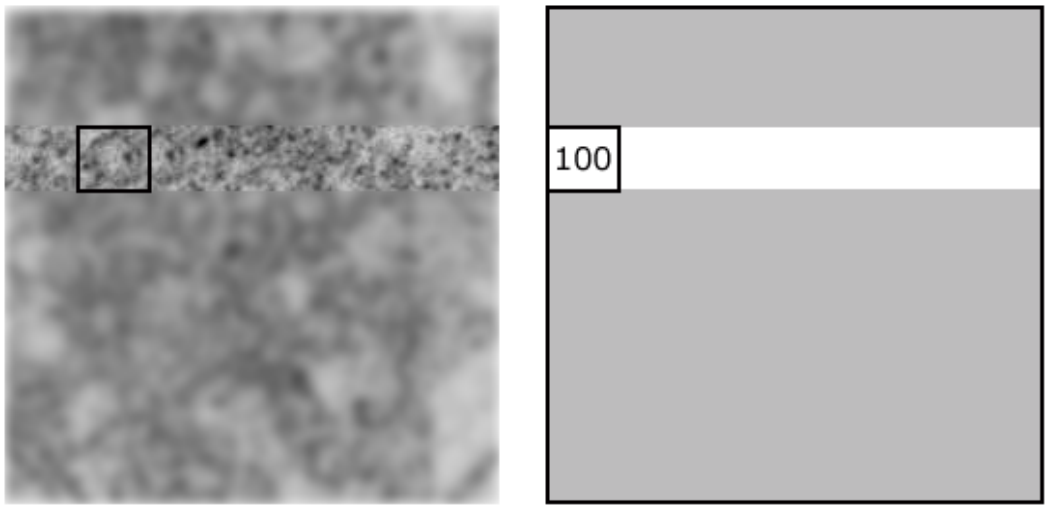

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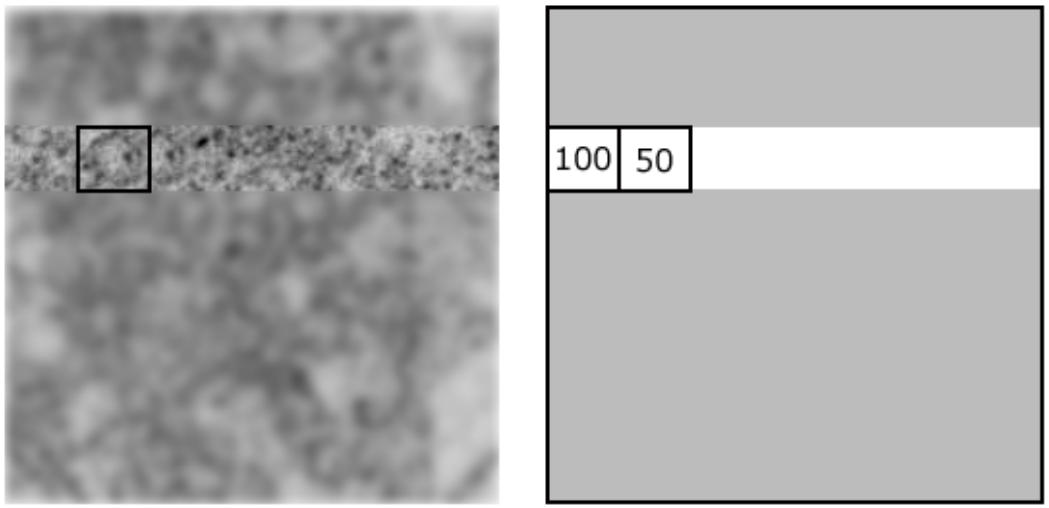

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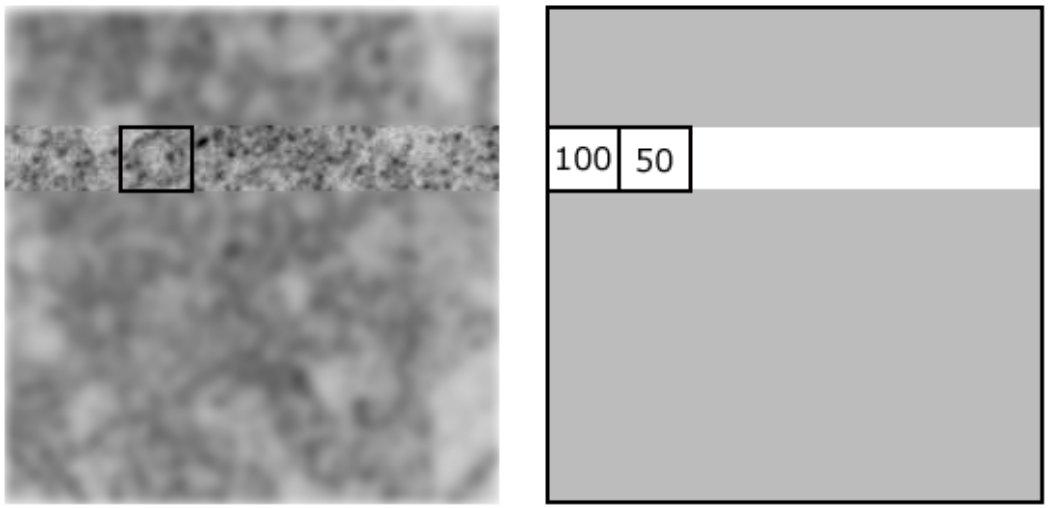

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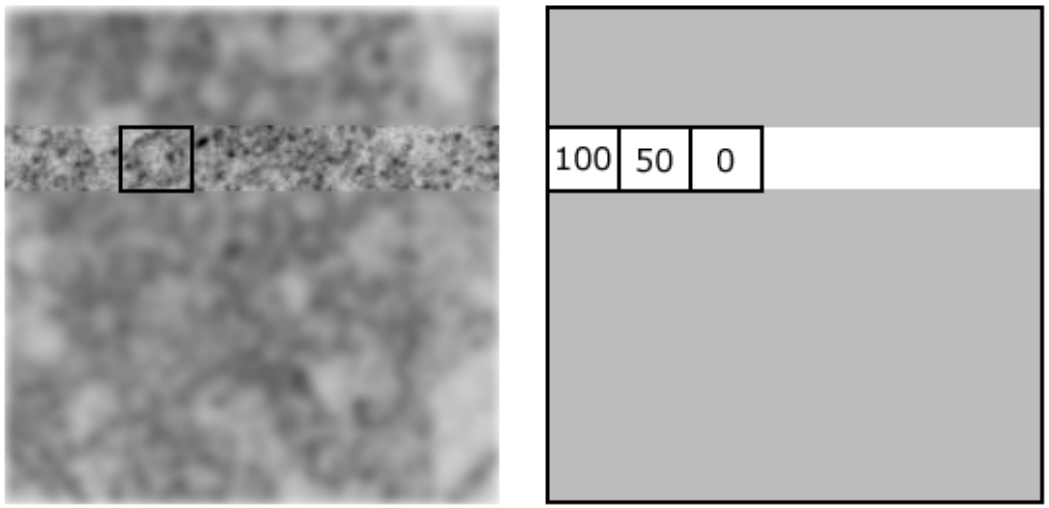

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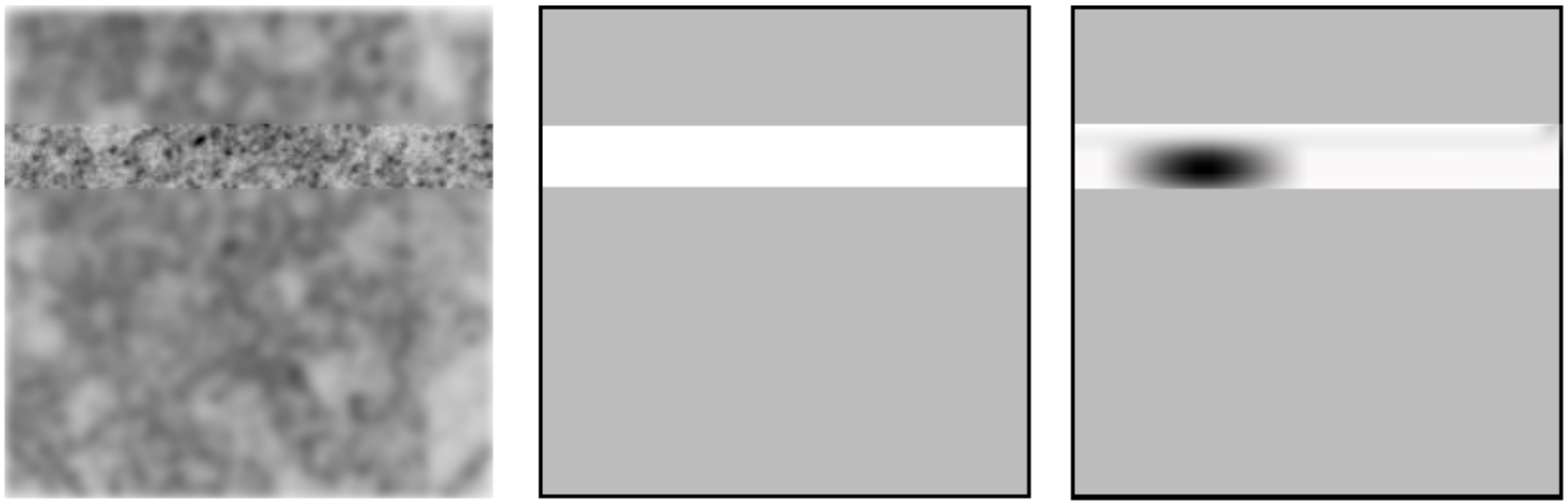

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