



Det Naturvidenskabelige Fakultet



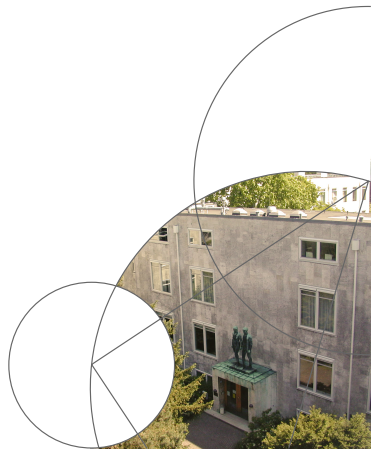
Detektion af vesikler i celler

Bachelorforsvar

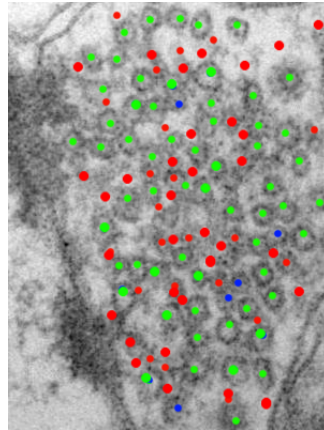
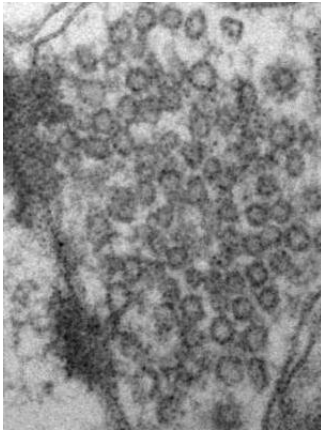
Claes Nøhr Ladefoged

Marcus Bjerg Gregersen

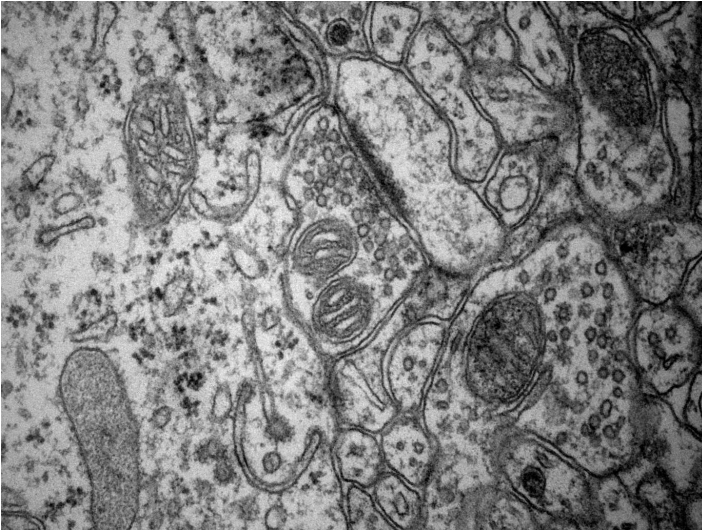
Datalogisk Institut



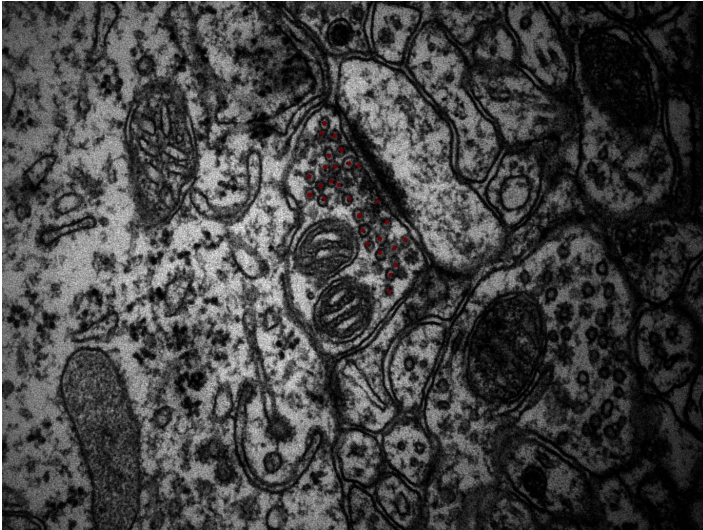
Resultatet



Introduktion



Introduktion



Billedbehandling - Fouriertransformation

Fouriertransformation

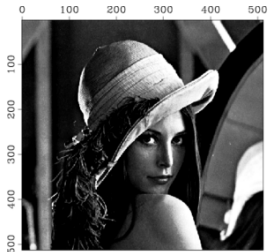
$$\hat{f}(\xi) = \int_{-\infty}^{\infty} f(x) e^{-2\pi i x \xi} dx, \text{ for } x \in \mathbb{R}$$

Invers fouriertransformation

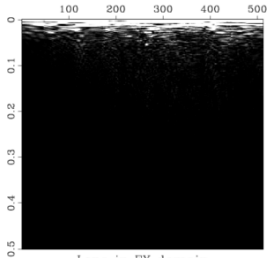
$$f(x) = \int_{-\infty}^{\infty} \hat{f}(\xi) e^{2\pi i x \xi} d\xi, \text{ for } x \in \mathbb{R}$$



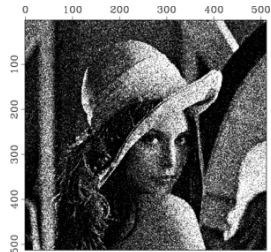
Billedbehandling - Fouriertransformation



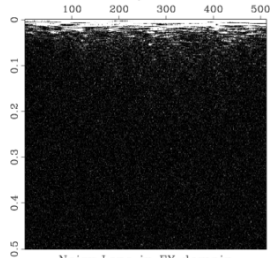
Lena



Lena in FX domain

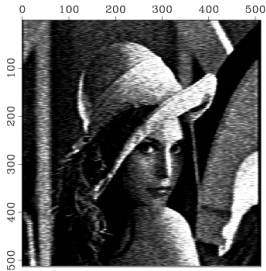


Noisy Lena

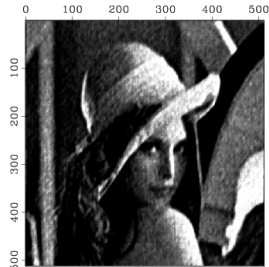


Noisy Lena in FX domain

Billedbehandling - Fouriertransformation



Noisy Lena LP filtered



Thresholding in the Fourier domain

Billedbehandling - Foldning

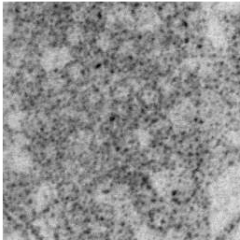
$$f(t) * g(t) = \int_{-\infty}^{\infty} f(\tau)g(t - \tau)d\tau$$



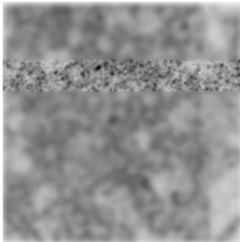
Billedbehandling - Gaussisk udglatning



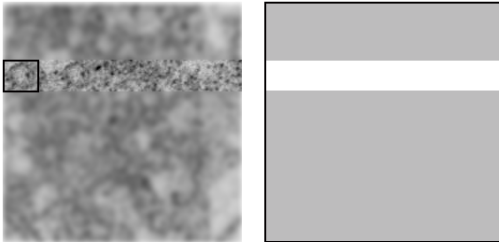
Segmentering med eksempelbilleder



Segmentering med eksempelbilleder



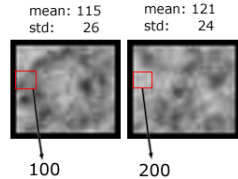
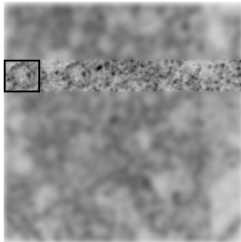
Segmentering med eksempelbilleder



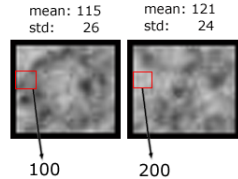
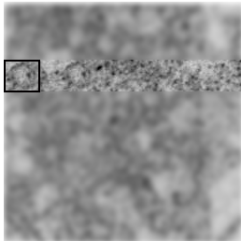
Segmentering med eksempelbilleder



Segmentering med eksempelbilleder

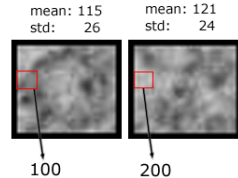
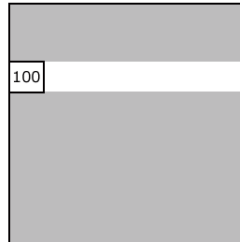
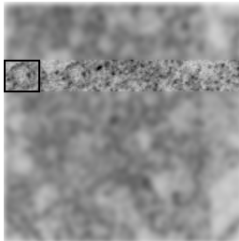


Segmentering med eksempelbilleder



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

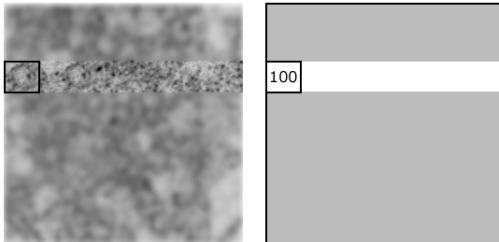
Segmentering med eksempelbilleder



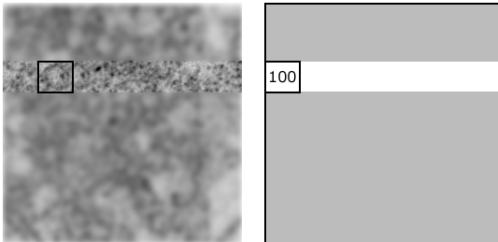
$$\left(\frac{I - \text{mean}(I)}{\text{std}(I)} - \frac{J - \text{mean}(J)}{\text{std}(J)} \right)^2$$

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

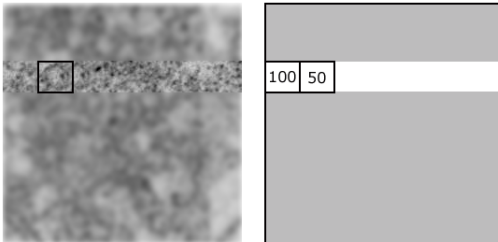
Segmentering med eksempelbilleder



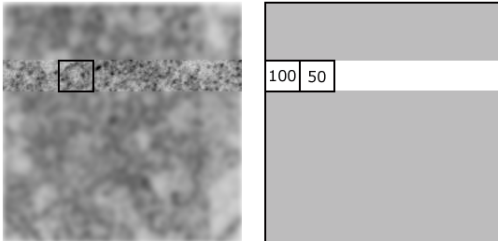
Segmentering med eksempelbilleder



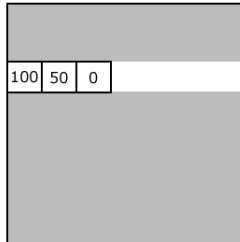
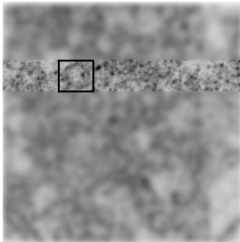
Segmentering med eksempelbilleder



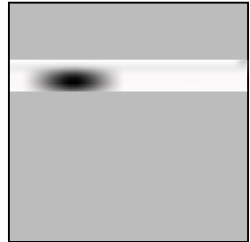
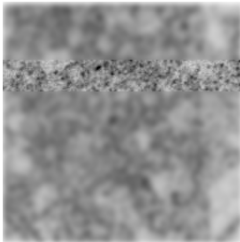
Segmentering med eksempelbilleder



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