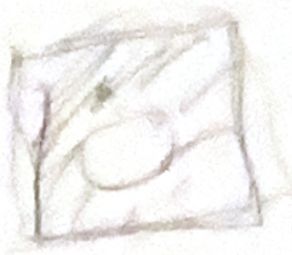
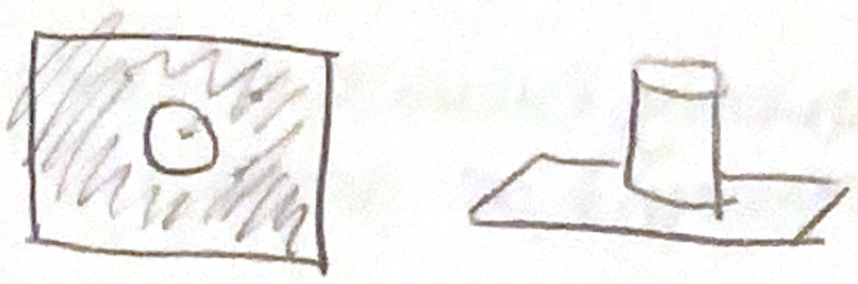
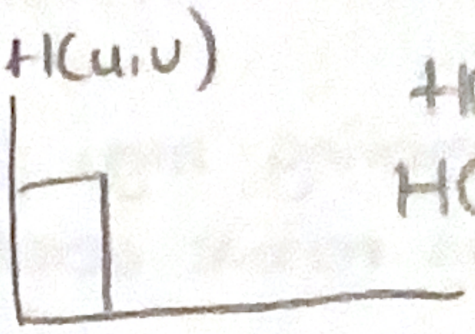
img f → fft2 → fftshift → F → F • H (dot product) → ifft shift → ifft → g

Smaller the white circle more blur (in LPF)



→ Ideal Filter



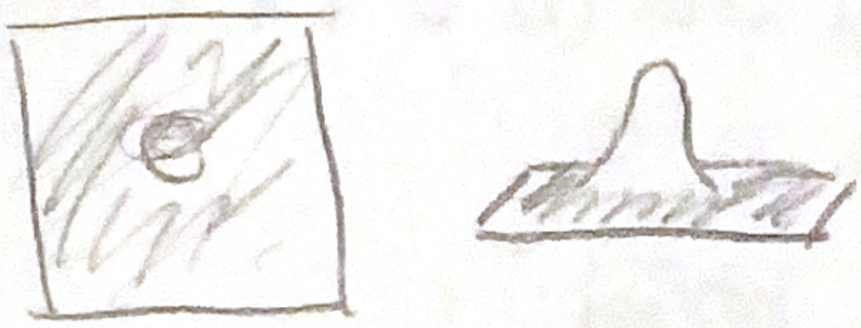


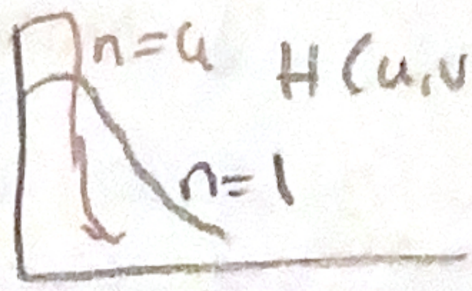
$H(u,v)=1$ if $D(u,v)<D_0$

$H(u,v)=0$ if $D(u,v)>D_0$

$$D(u,v)=\sqrt{(u-M/2)^2+(v-N/2)^2}$$

→ Butterworth

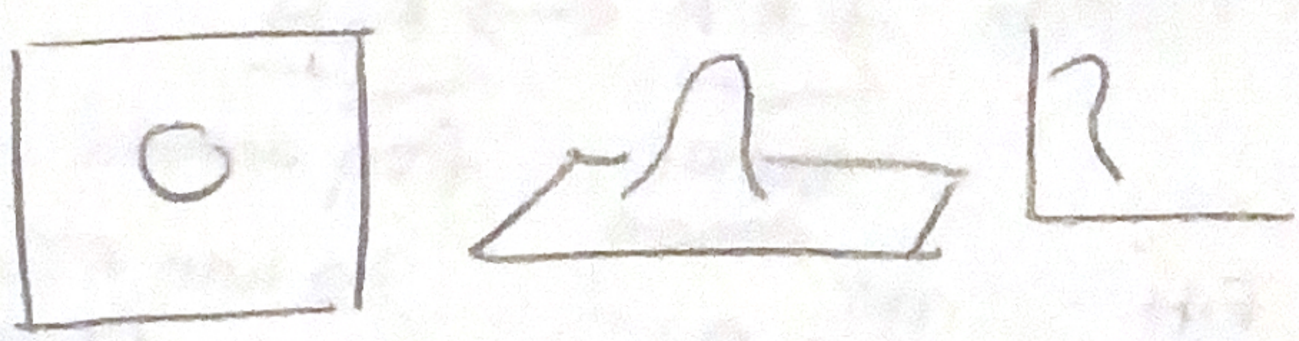




$$H(u,v)=\frac{1}{(1+D(u,v)/D_0)^{2n}}$$

kernel — order

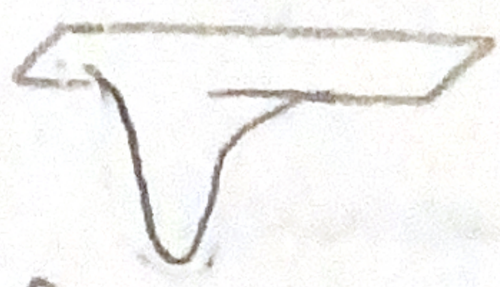
Gauss



$$D(u,v)=\exp\left(\frac{-D(u,v)^2}{2D_0^2}\right)$$

D_0 ↓ cutoff freq

HPF = 1 − LPF →



D_0 ↗ HPF edge'les edir

D_0 ↙ LPF blur ↗