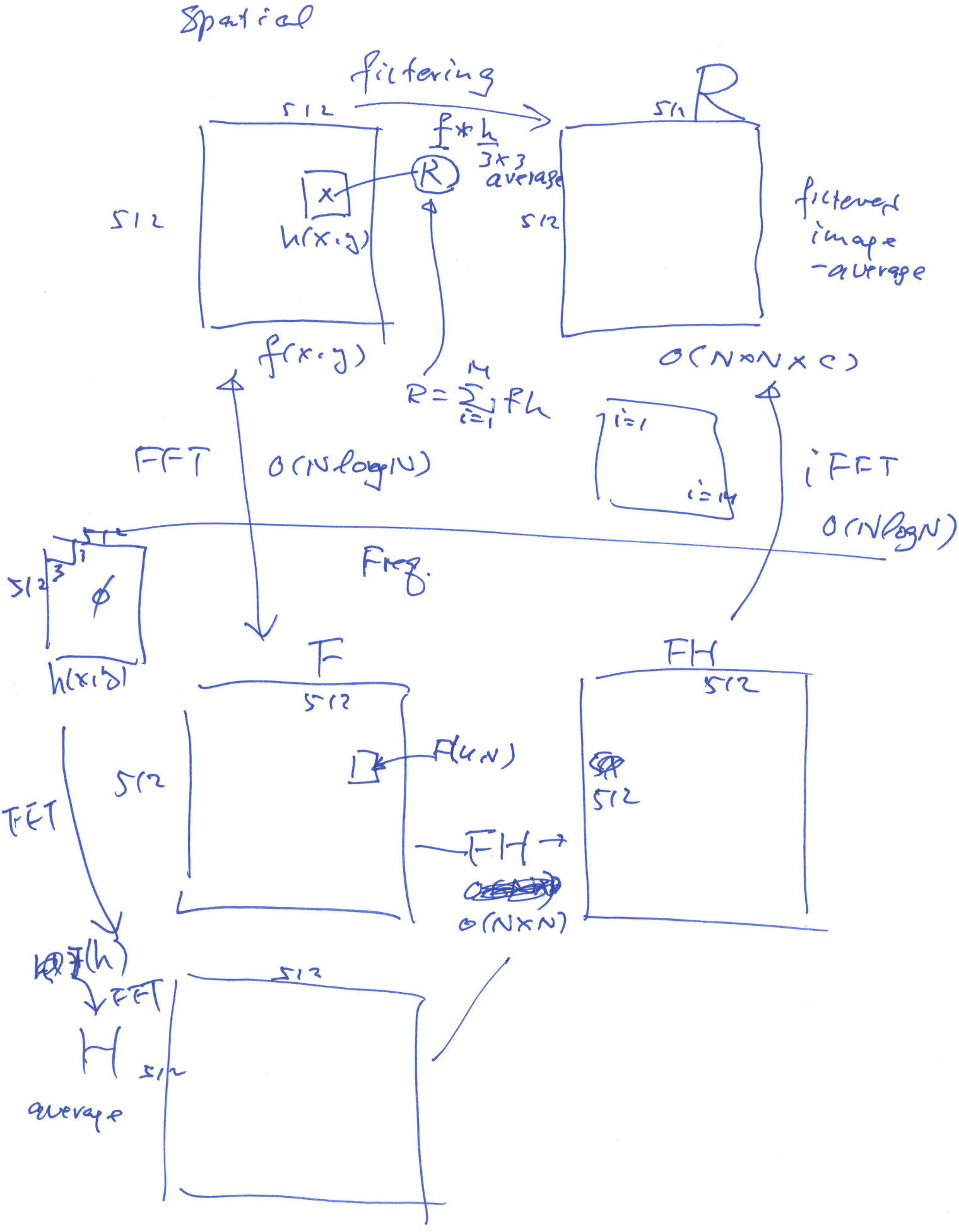
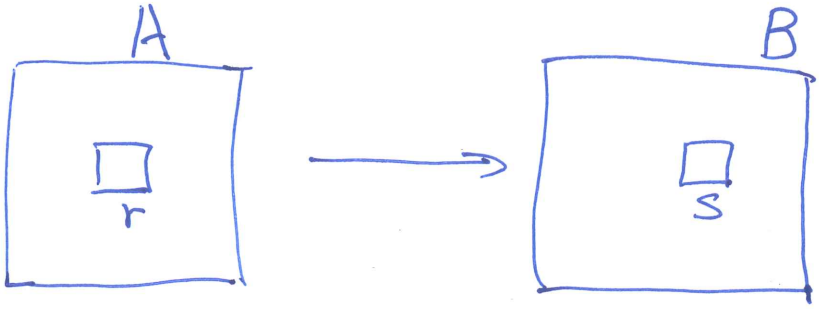
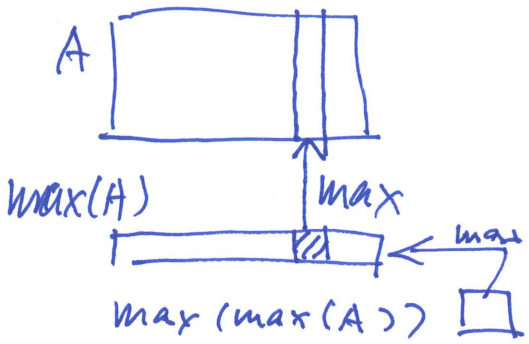

Spatial
filtering
512
f * h
3×3
average
R
512
512
x
h(x,y)
512
filtered
image
-average
f(x,y)
O(N×N×c)
R = Σ fh
i=1
FFT
O(NlogN)
i=1
i=14
iFFT
O(NlogN)
Freq.
512
3
3
h(x,y)
F
512
512
F(u,v)
FFT
FH
512
512
FH
O(N×N)
FFT(h)
512
H
512
average

Linear intensity transformation



8-bit representation

$$S = T[r]$$



$1000 = I_{max} = max(max(A))$

$100 = I_{min} = min(min(A))$

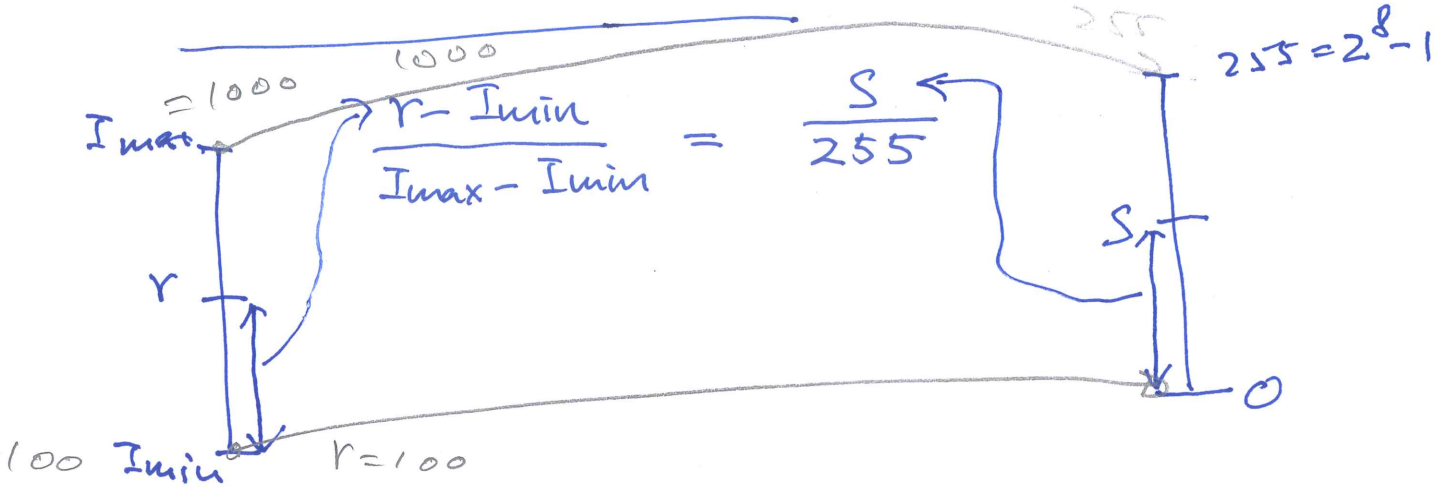
$$\frac{I_{max} - r}{I_{max} - I_{min}} = \frac{255 - S}{255 - 0}$$

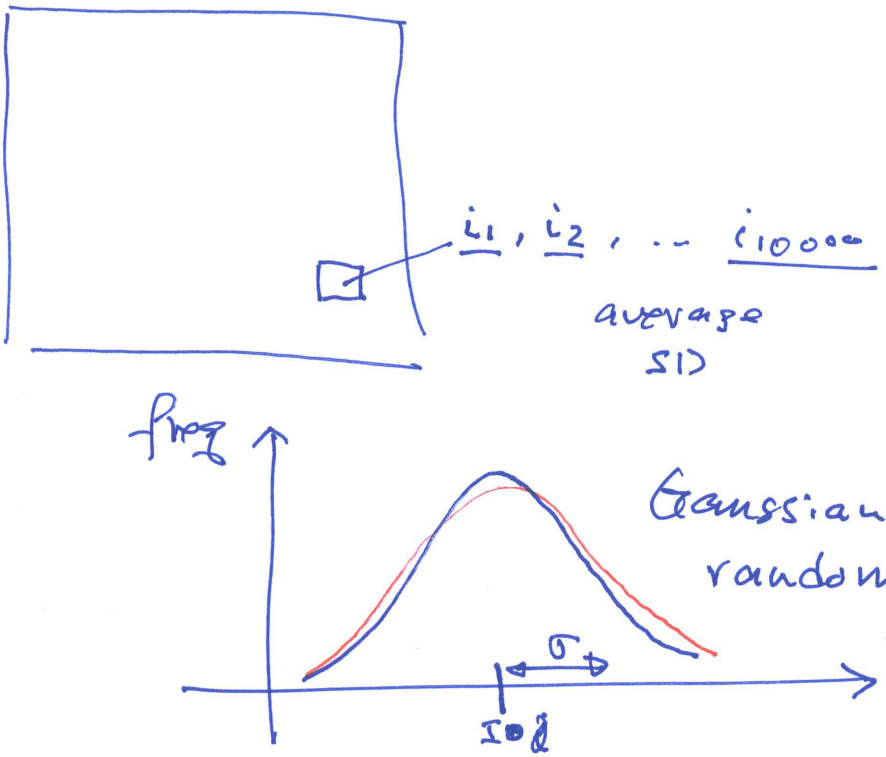
$$S = 255 - 255\left(\frac{I_{max} - r}{I_{max} - I_{min}}\right)$$

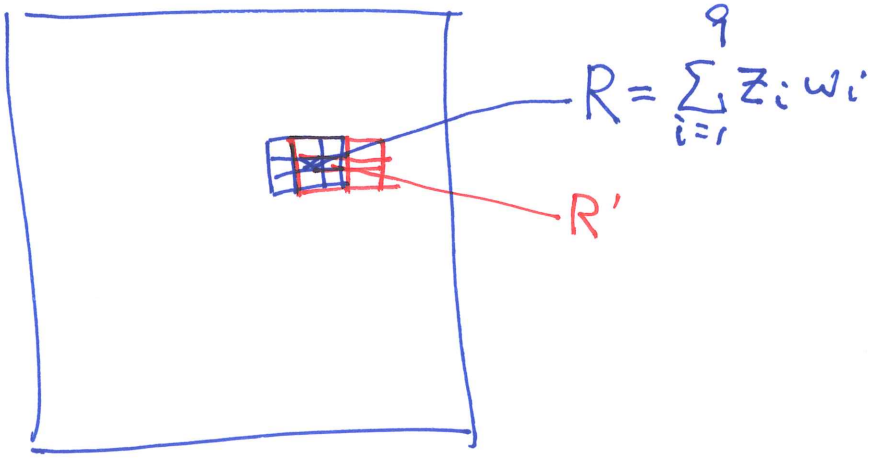
$$= 255\left[1 - \frac{I_{max} - r}{I_{max} - I_{min}}\right]$$

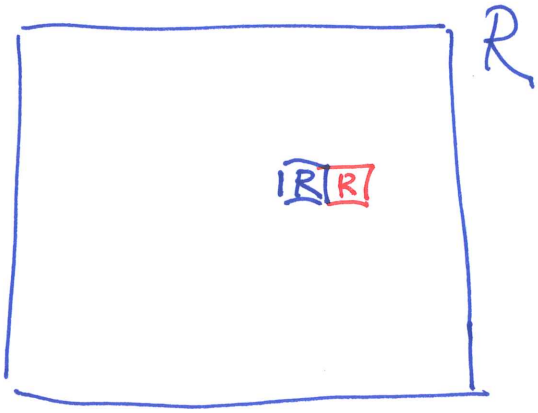
$$= 255\ \frac{I_{max} - I_{min} - I_{max} + r}{I_{max} - I_{min}}$$

$$= 255\ \frac{(r - I_{min})}{I_{max} - I_{min}}$$




$i_1, i_2, \ldots i_{10000}$
average
SID
freq
Gaussian
random noise
σ
I0d
i


$R = \sum_{i=1}^{9} z_i w_i$
R'


R
R