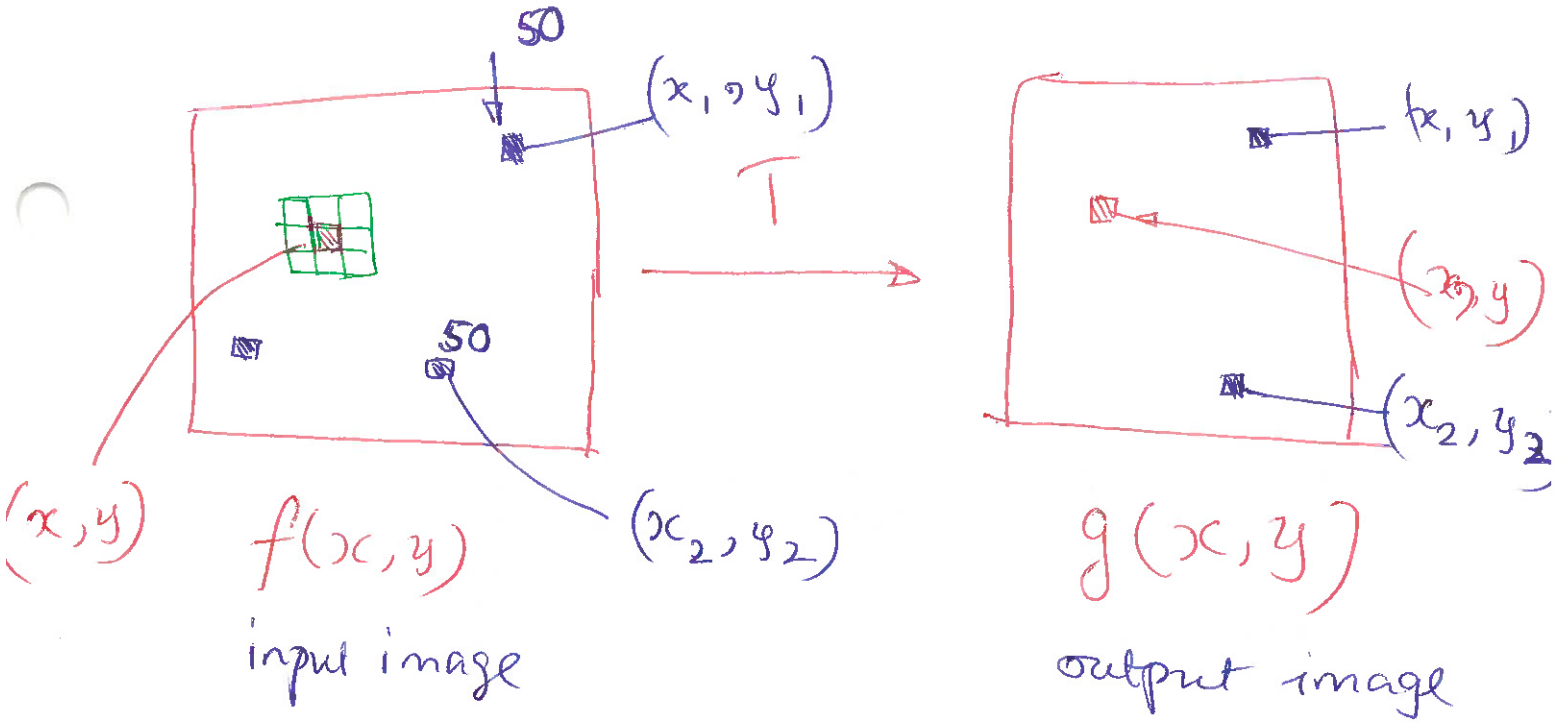


1024 x 1024

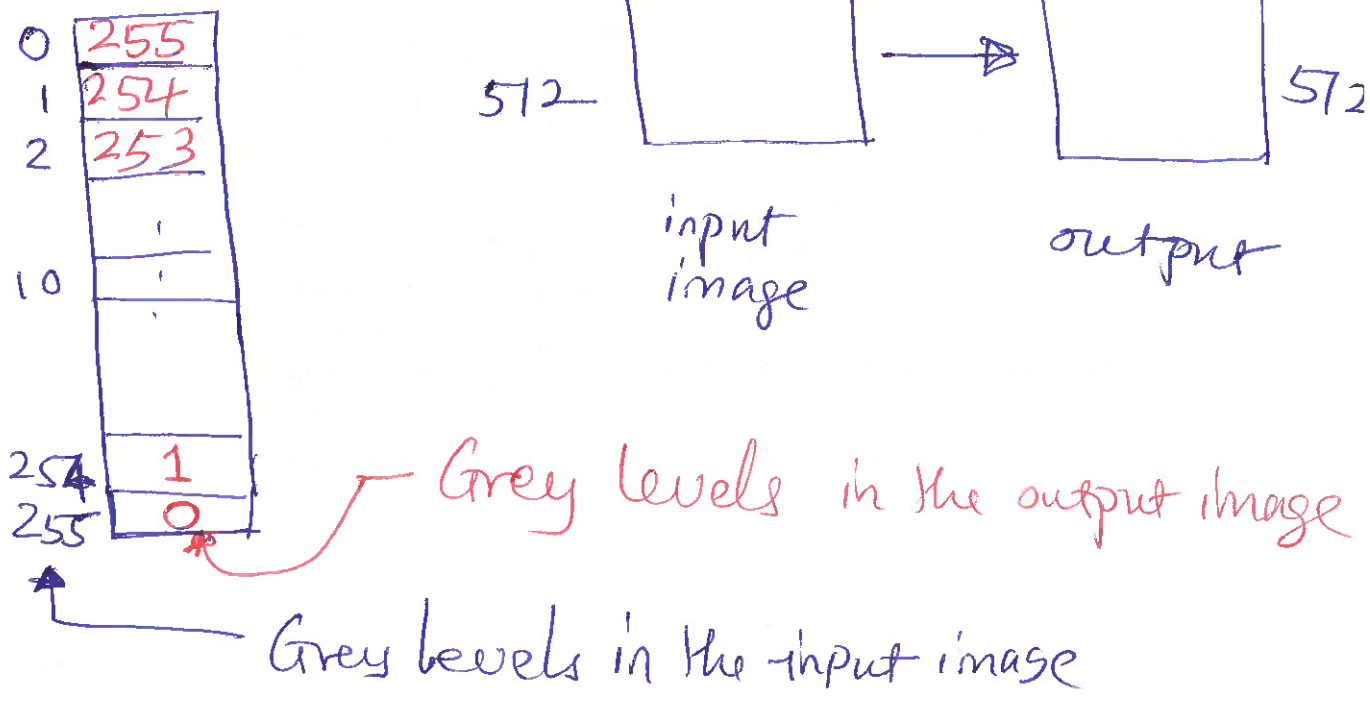
8-bit → 256

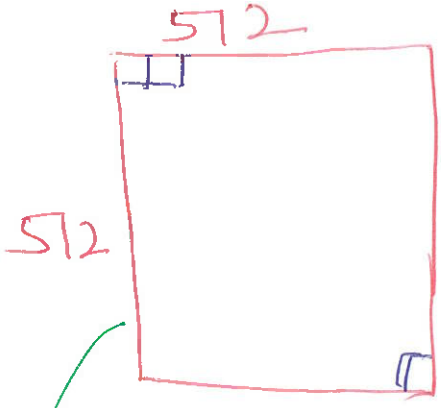
1024 x 1024 x 256 Rules

Slide#30

Point Processing 256 Rules

LUT #32

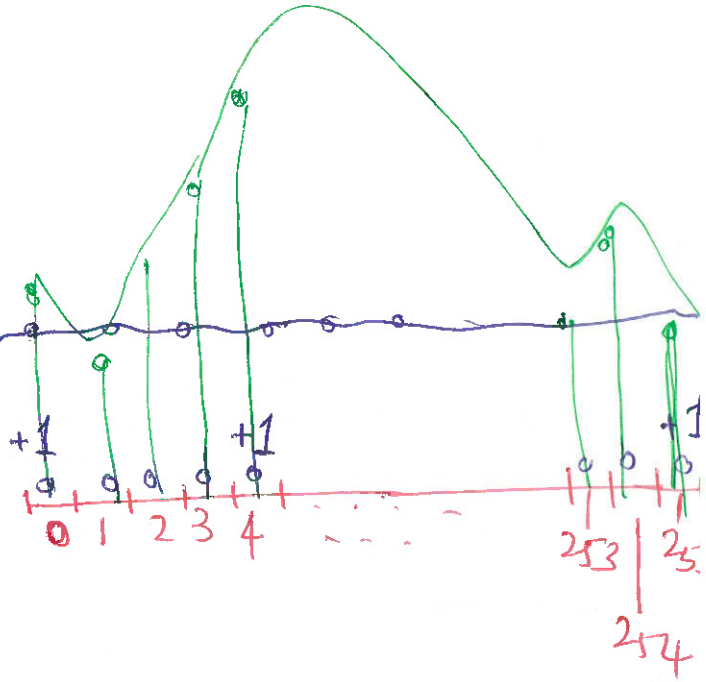




8-bit, 256 Levels.

$n = 512 \times 512$

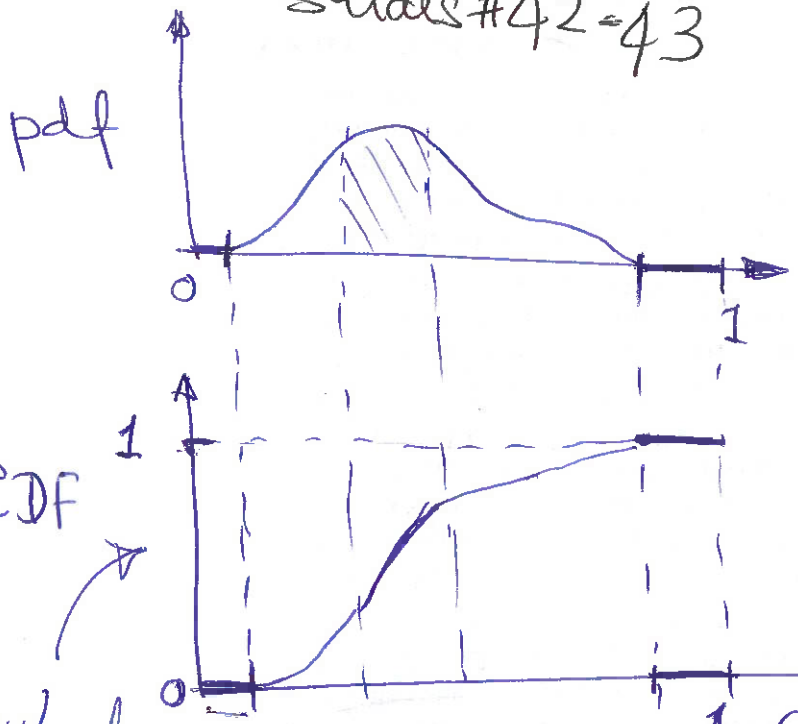
size



Histogram Equalisation

Continuous 0 — 1

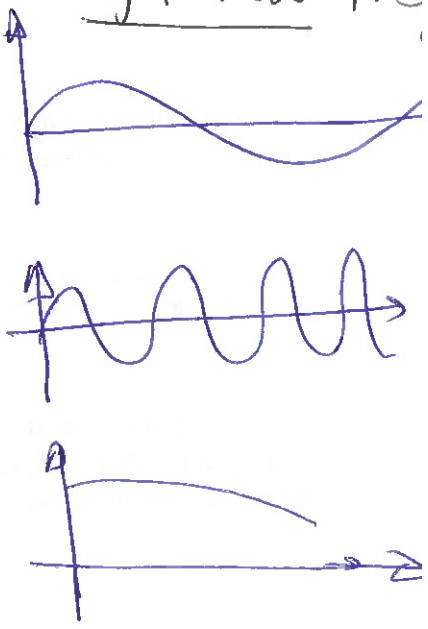
Slides #42-43



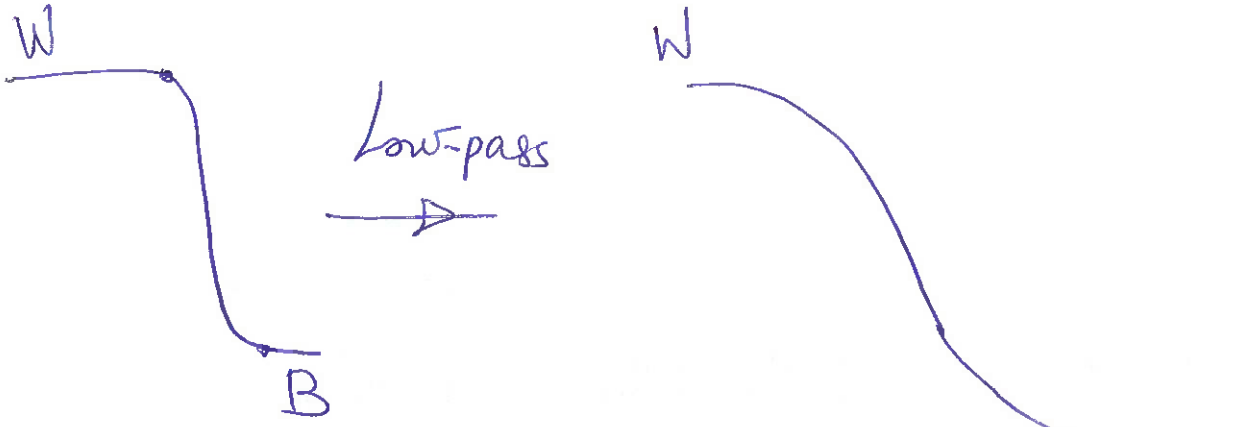
Greyleuels in output image

Greylevels in input image

High-Low Fre



Slide #5



original

Sharp

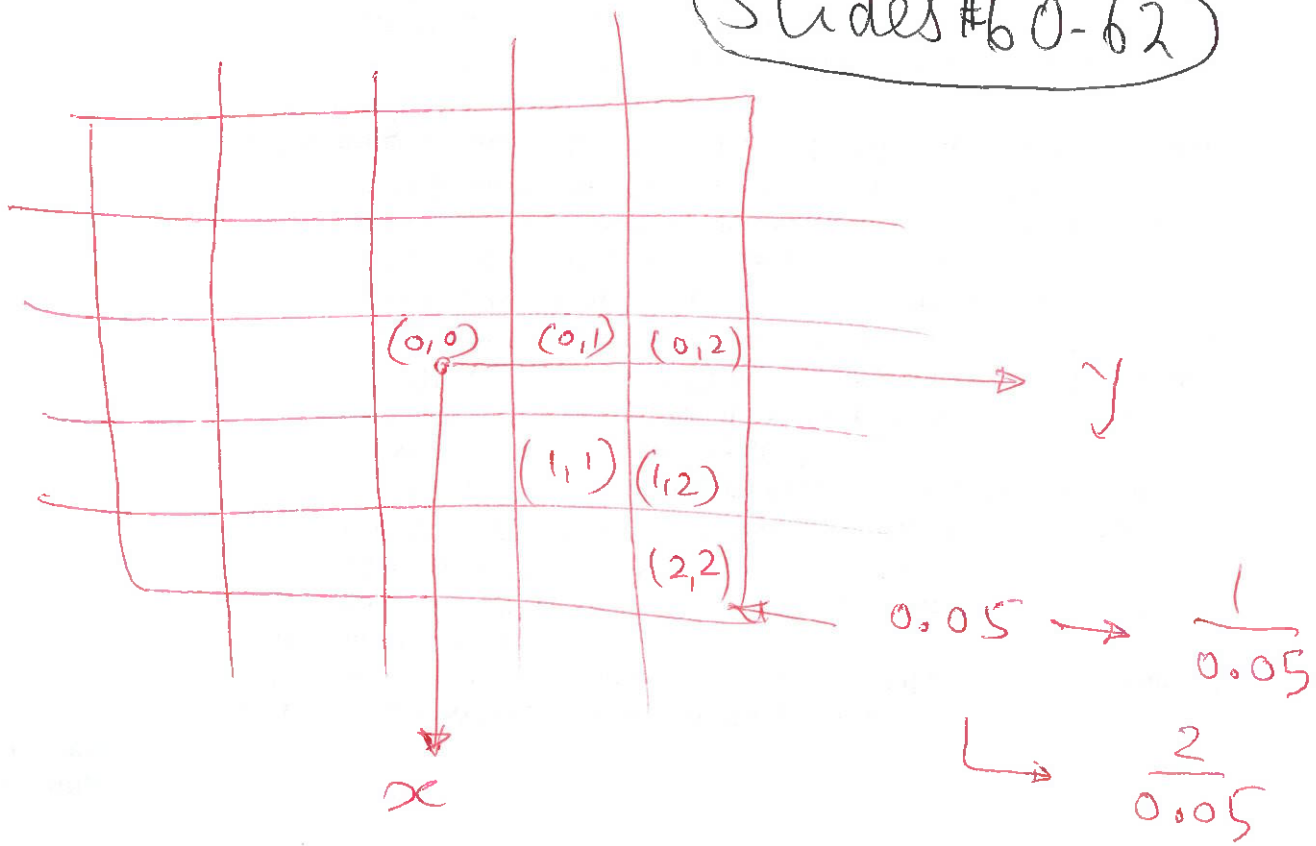
Slide #56

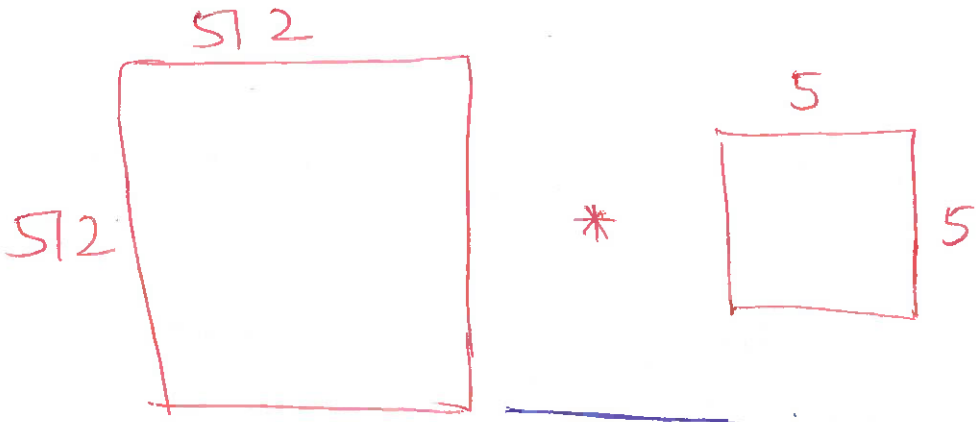
Blurring

$e^{-\frac{x^2+y^2}{2\sigma^2}}$

$x = 0$
$y = 0$

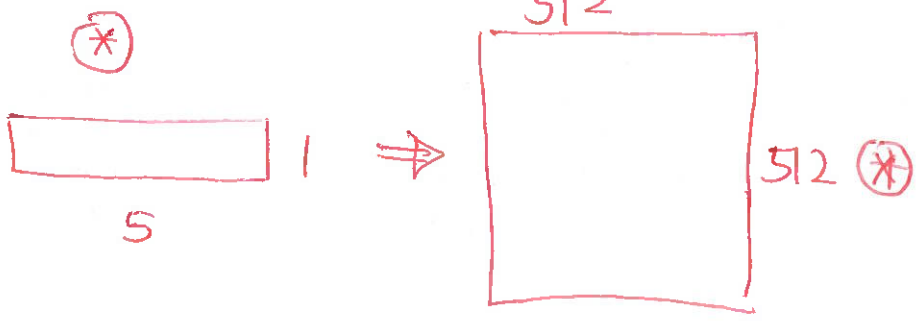
Slides #60-62





Total multi-
-plications

$= 512 \times 512 \times 2$



Total multiplications for 1×5

$= 512 \times 512 \times 5$ —— (A)

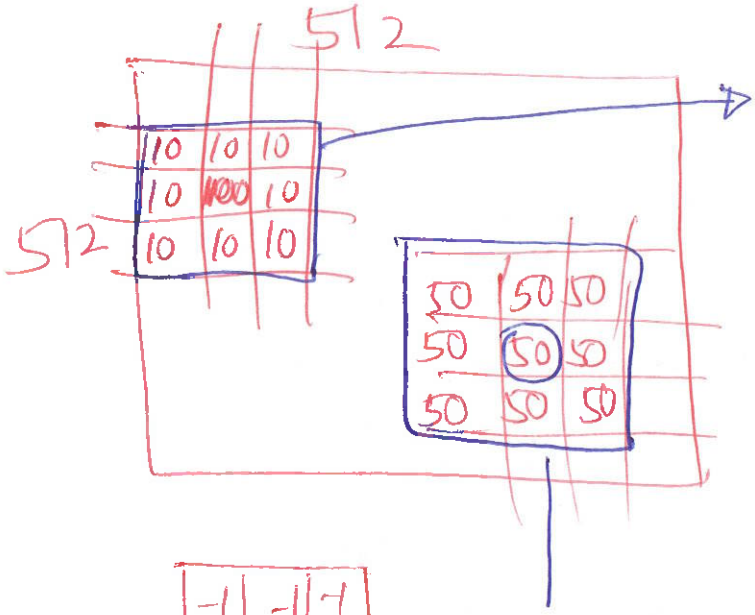
for 5×1

$= 512 \times 512 \times 5$ —— (B)

(A) + (B) $= 512 \times 512 \times 10$

Final output image

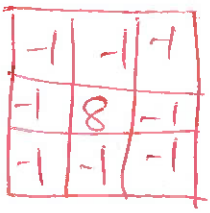
Slide67 - Explaining the Computation Reduction



$-1 \times 10 + (-1) \times 10 + \cdots + 8 \times 100 = 720$

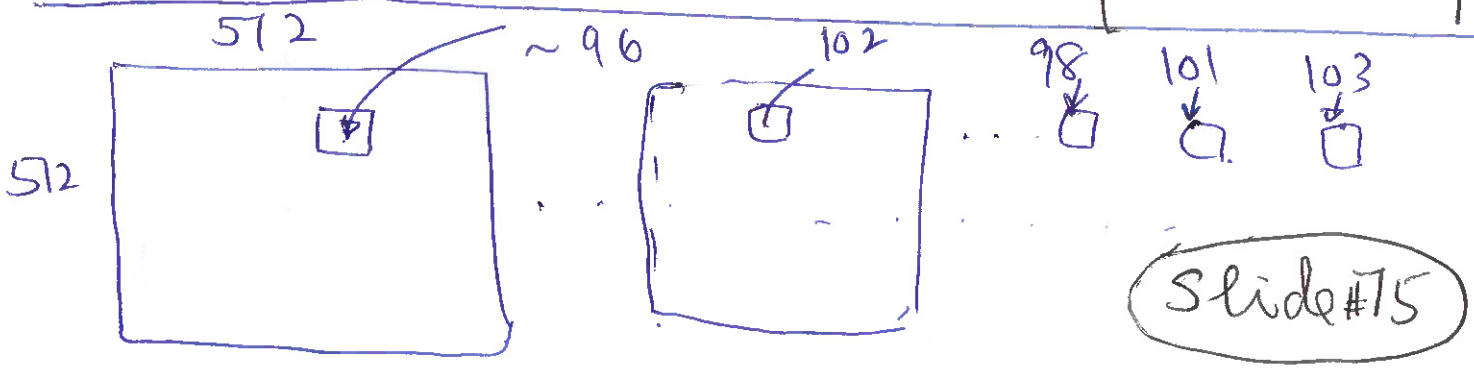
8-bits

0 - 255



$50 \times (-1) + 50 \times (-1) \cdots + 8 \times 50 = 0$

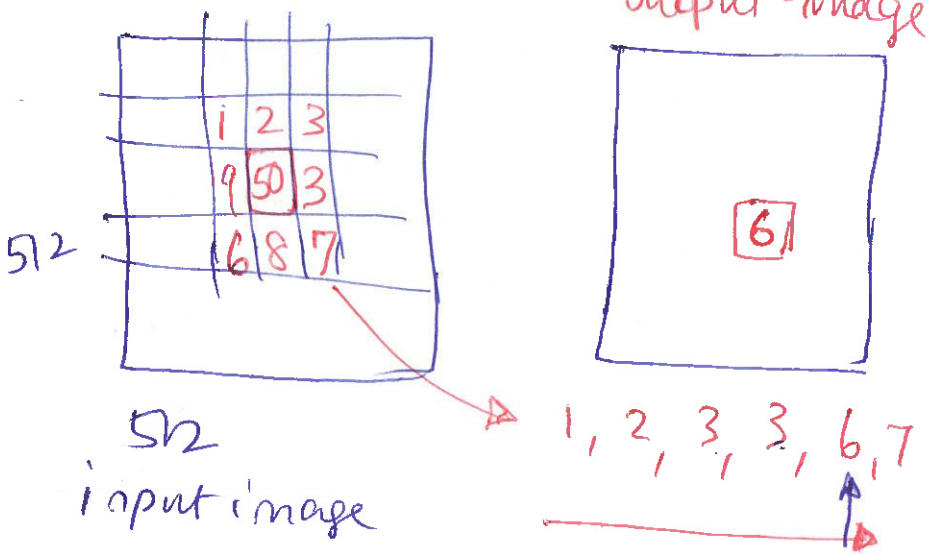
Slide #71
High Pass



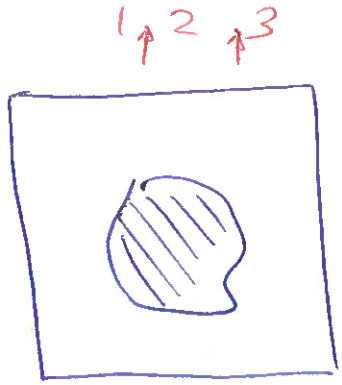
Slide #75

True value ≈ 100

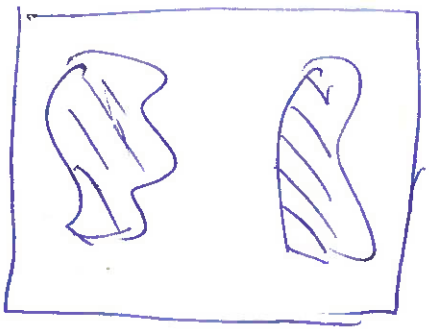
$\text{Round}\left(\frac{96+102+98+101+103}{5}\right) \approx 100$

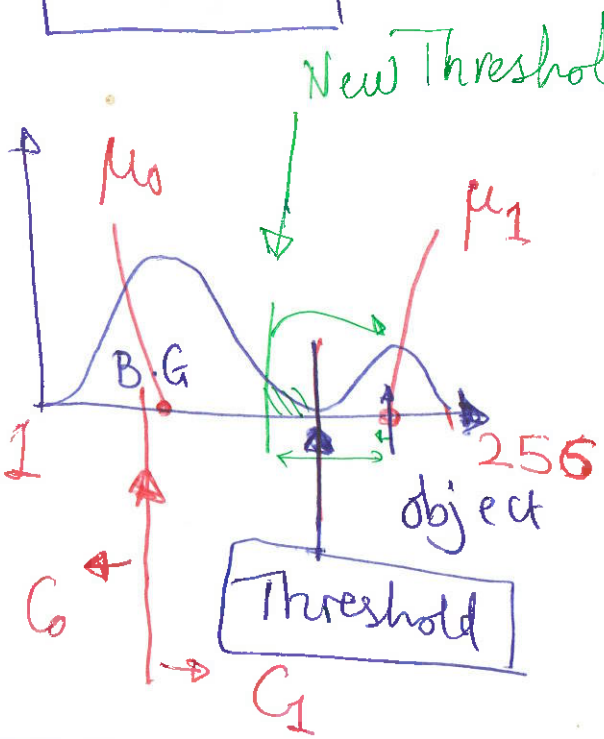


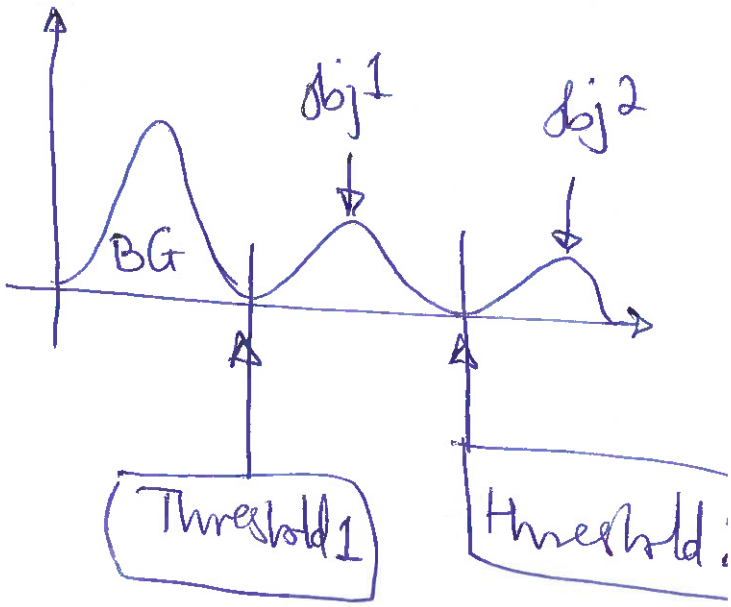
Slide 76
Median Filter



Slide #81







1, 2, 2, 3, 3, 4, 5, 6, 7, 7

$$\frac{1}{10}\times 1 + \frac{2}{10}\times 2 + \frac{2}{10}\times 3$$

$$0.5$$

$$\Rightarrow \frac{1}{5}\times 1 + \frac{2}{5}\times 2 + \frac{2}{5}\times 3$$

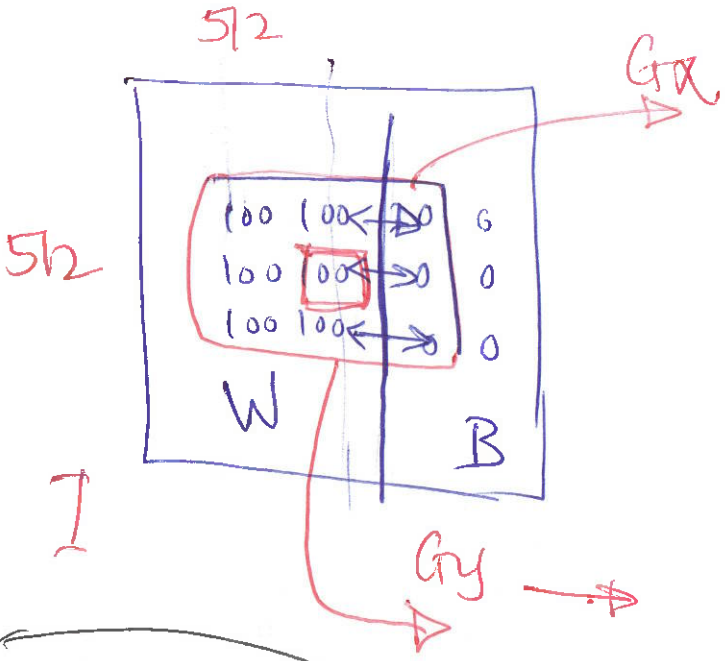
$$+\frac{1}{10}\times 4 + \frac{1}{10}\times 5 + \frac{1}{10}\times 6 + \frac{2}{10}\times 7$$

Slide #82

$1.0 = x$ (3)

$5.0 = x$ (2)

$2.0 = x$ (1)



$= -1 \times 100 + (-2) \times 100 + (-1) \times 0$

$0 + 0 + 0$

$= -400$

Slide#91

$1 \times 100 + 2 \times 100 +$ 0×1

$-1 \times 100 + (-2) \times 100 +$ $0 \times (-1)$

$=$

$I * G_x$

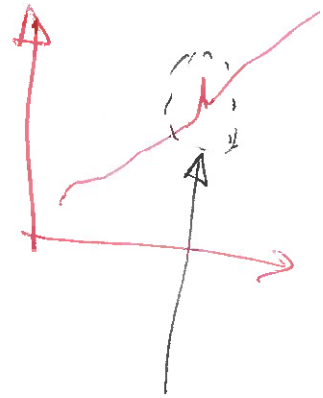
$I * G_y$

512 512 512 512

Slide#89

512 512

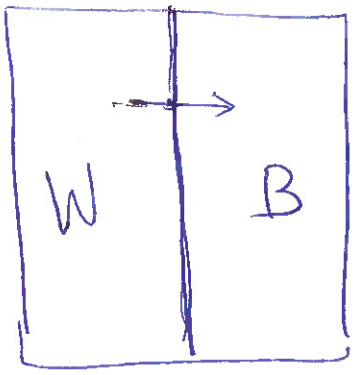
$|\nabla I|$ $\theta(x,y)$

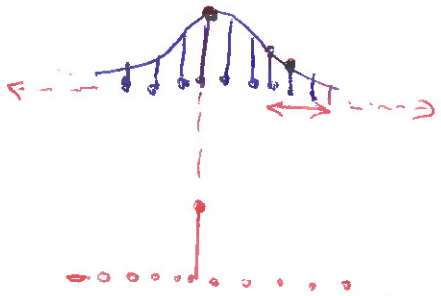


Small noise will be magnified by differentiation

Slide#92

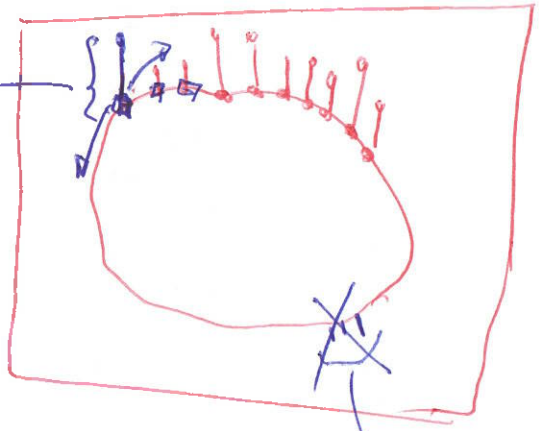
slide 94





Non-maxima Suppression

Greater than T_1

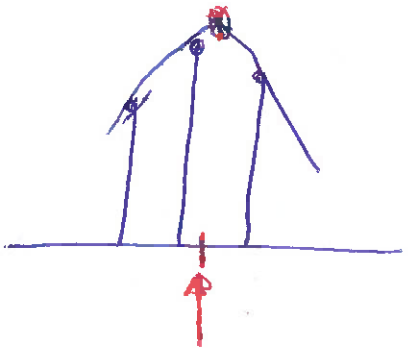


$T_2 < T_1$

Smaller than T_2

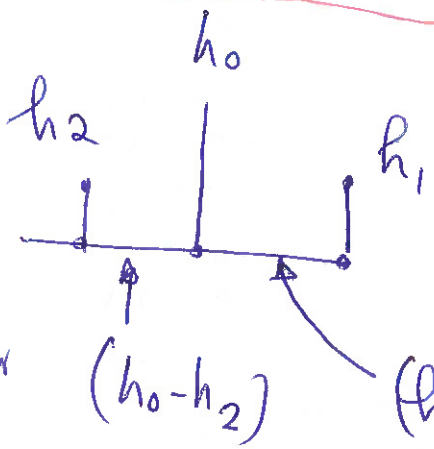
(Slide 94)

(Slide97)



Sub-pixel localisation

(Slide 95)

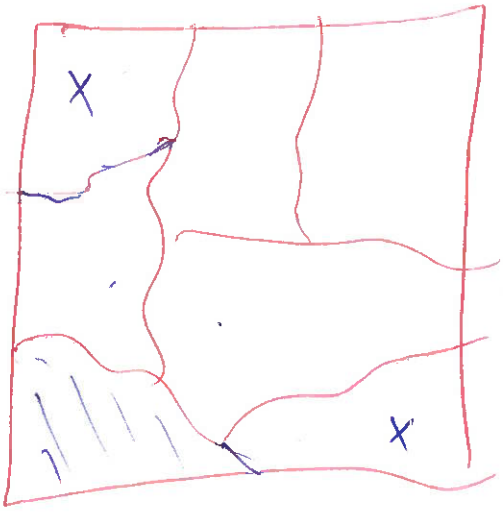


2nd order differenci

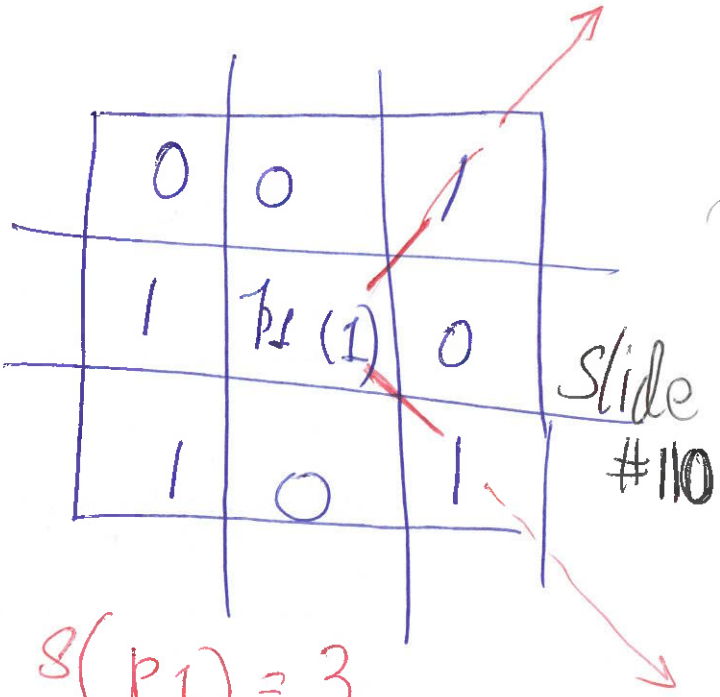
$$\begin{bmatrix} 1 \\ -2 \\ 1 \end{bmatrix}$$

2nd order $(h_1 - h_0) - (h_0 - h_2)$

$= 1.h_2 - 2h_0 + 1h_1$ $\quad [1 \quad -2 \quad 1]$

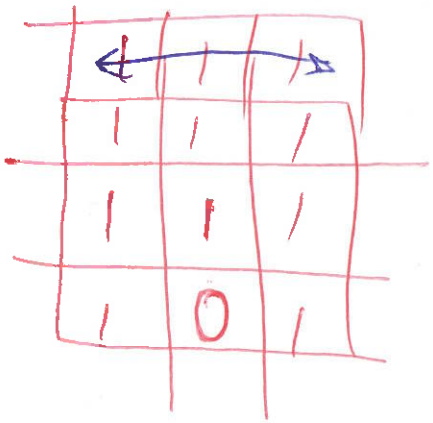


Slide # 102



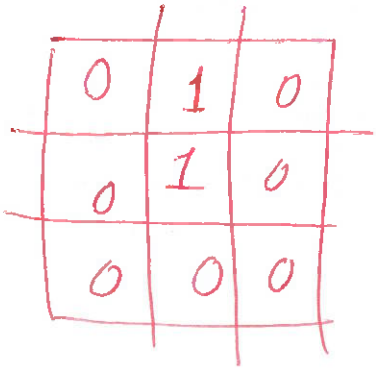
Slide #110

$S(P_1) = 3$



$N(P_1) = 7$

Excessive Erosion

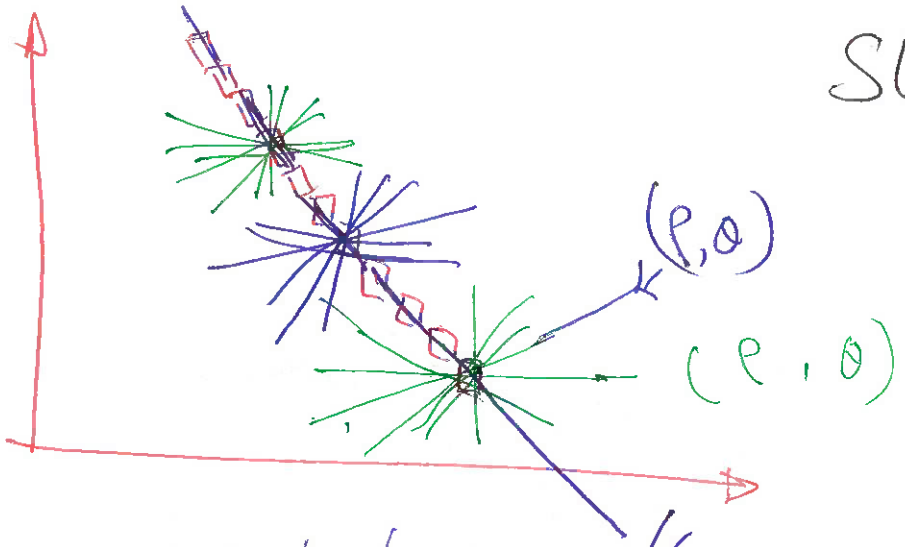


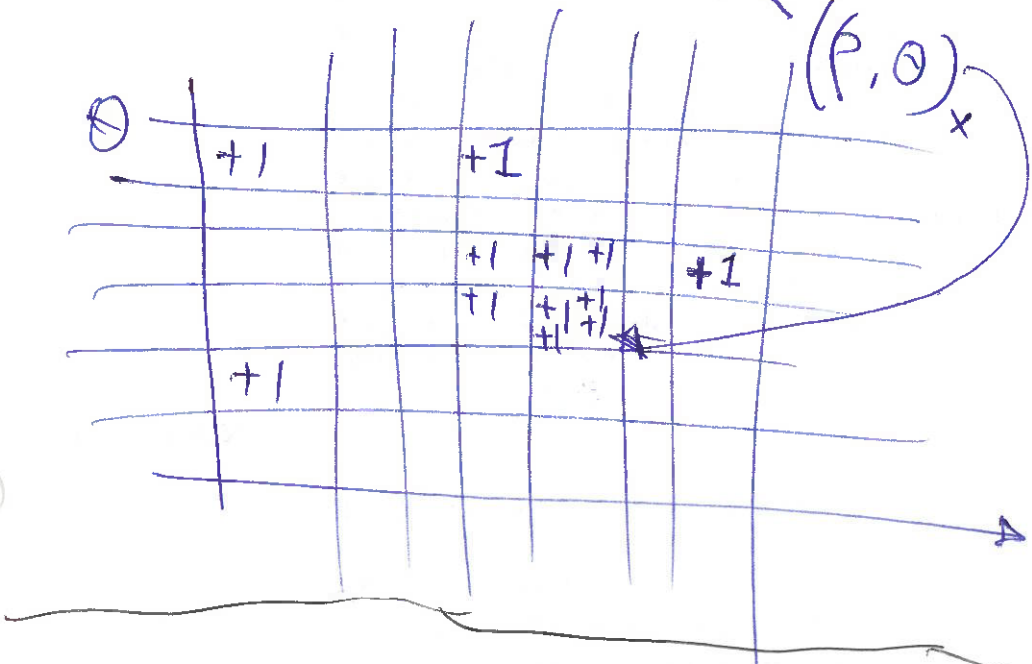
$N(P_1) = 1$

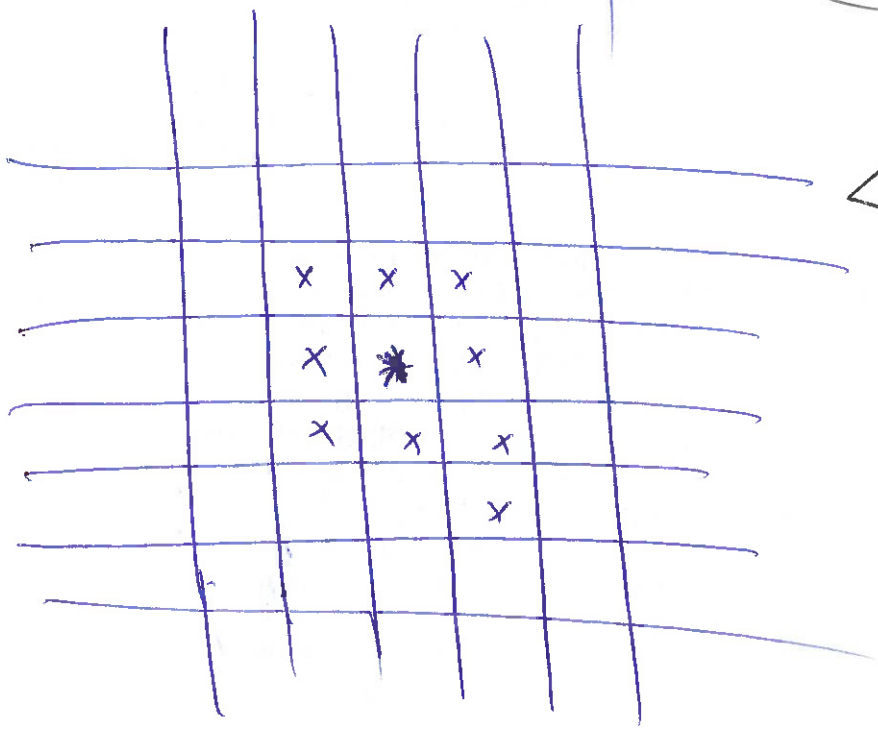
Turning is completed.

Slide #111

Slide #118





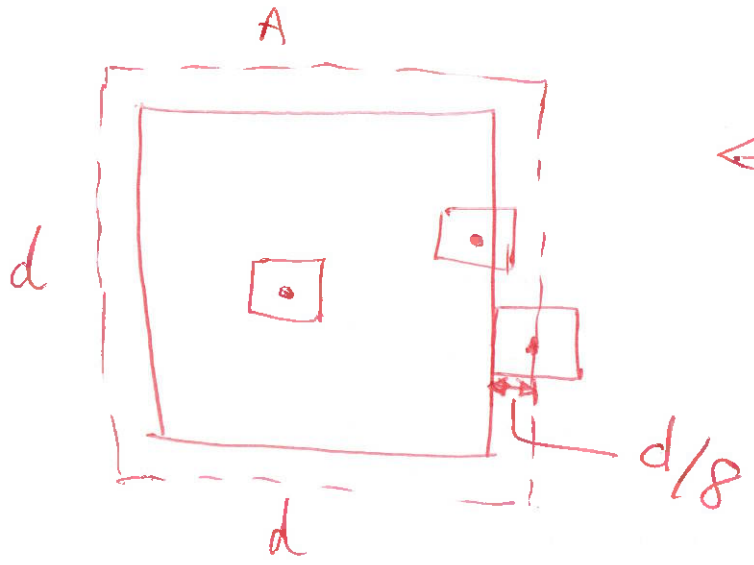


Slide #130

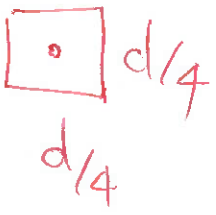
$\langle \cdot \rangle$ weighted Average

1	2	1
2	4	2
1	2	1

Divide by = 16



← dilation



slide #146

dilation ⊕ , Erosion ⊖

Fully Contained

slide # 147