7.1

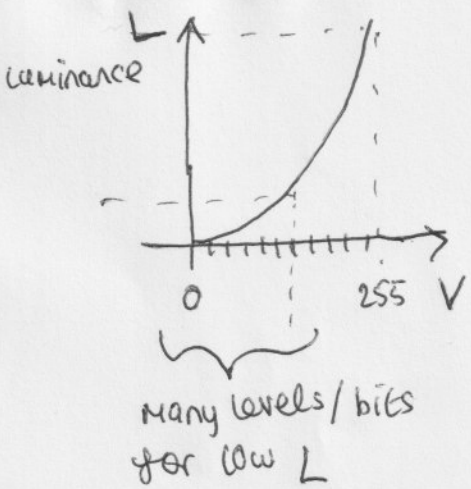
$$\begin{bmatrix} \rho_1 \\ \rho_2 \\ \rho_3 \end{bmatrix}' = \begin{bmatrix} \lambda_1 & 0 & 0 \\ 0 & \lambda_2 & 0 \\ 0 & 0 & \lambda_3 \end{bmatrix} \begin{bmatrix} \rho_1 \\ \rho_2 \\ \rho_3 \end{bmatrix}$$

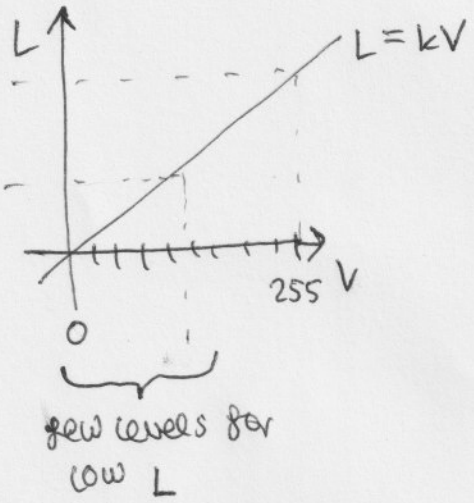
← raw sensor counts of RGB

greyworld $\sum_i \rho_{1i} = \sum_i \rho_{2i} = \sum_i \rho_{3i}$

7.2

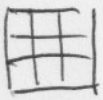
$L = V^\gamma \quad \gamma = 2.2$





7.3

Normalised correlation



$I(x,y)$ vectorize $\begin{pmatrix} I_{11} \\ I_{12} \\ \vdots \\ I_{21} \\ \vdots \\ I_{33} \end{pmatrix} = \underline{I}$

ordinary correlation I, J

$corr(I,J) = I^T J$

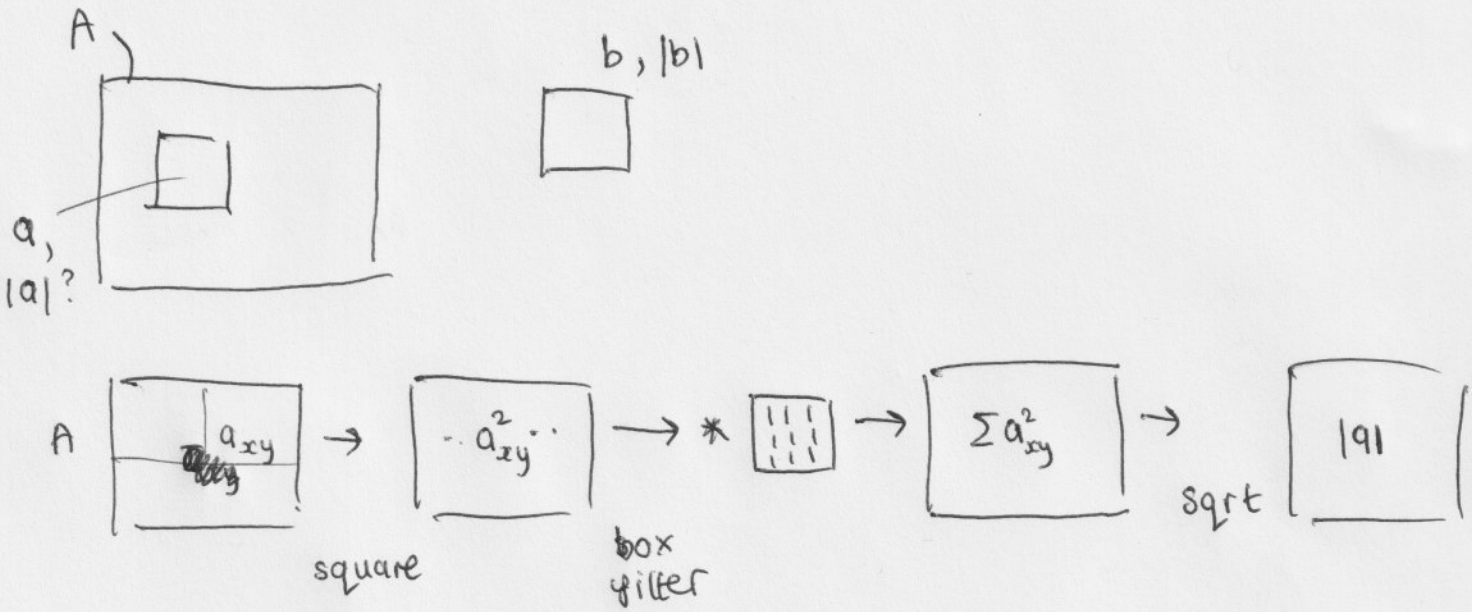
normalised correlation

$$ncorr(I,J) = \frac{I^T J}{|I||J|} = \cos\theta \qquad |I| = \sqrt{\sum_i I_i^2}$$

$I^T J = |I||J| \cos\theta$

$SSD = |I-J|^2 = (I-J)^T(I-J) = |I|^2 + |J|^2 - 2I^T J$

if $|I| = |J| = 1$, $SSD = 2 - 2\,CORR$


A
b, |b|
a,
|a|?
A
a_{xy}
a_{xy}^2
*
Σa_{xy}^2
sqrt
|a|
square
box
filter