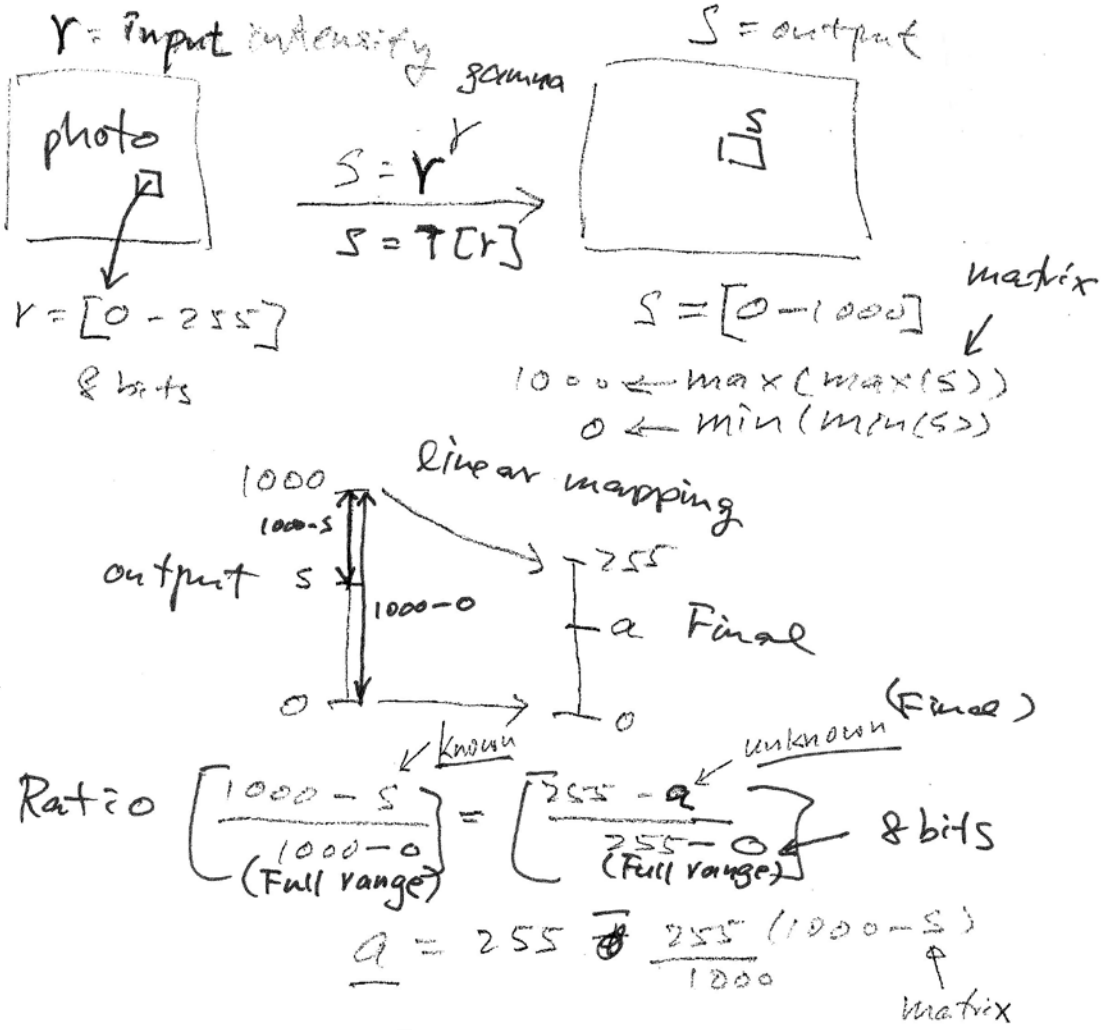
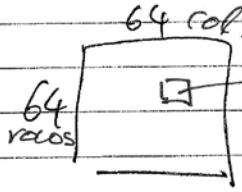

r = input intensity
gamma
S = output
photo
$S = r^{\gamma}$
$S = T[r]$
S
r = [0 - 255]
8 bits
S = [0 - 1000]
matrix
1000 ← max(max(S))
0 ← min(min(S))
linear mapping
1000
1000-S
output S
1000-0
0
255
a Final
0
(Final)
Known
unknown
Ratio
$\left[\frac{1000 - S}{1000 - 0}\right] = \left[\frac{255 - a}{255 - 0}\right]$
(Full range)
(Full range)
8 bits
$a = 255 - \frac{255}{1000}(1000 - S)$
matrix
a = [0 - 255]
8 bits image for a

Input image



$64 \times 64 = 4096$

$N = 4096$

Total number of pixels $= 64 \times 64 = 4096$ pixels $= MN$ $\quad M = 64,\ N = 64$

3 bits: 0 to $2^3 - 1$

Intensity k	0	1	2	3	4	5	6	7
New intensity r_k	0/7	1/7	2/7	3/7	4/7	5/7	6/7	7/7
$Pr(r_k)$	790/4096	1023/4096	850/4096	656/4096	329/4096	245/4096	122/4096	81/4096
$S_k = T[r_k]$	0.19	0.25	0.21	0.16	0.08	0.06	0.03	0.02
Output S_k	0.19	0.44	0.65	0.81	0.89	0.95	0.98	1
Gray levels	1	3	5	6	6	7	7	7

$\sum_i Pr(r_k) = 1$

Stretching: 0 1 2 → 1 3 5

3, 4 → 6 compressing

5, 6, 7 → 7 compressing