

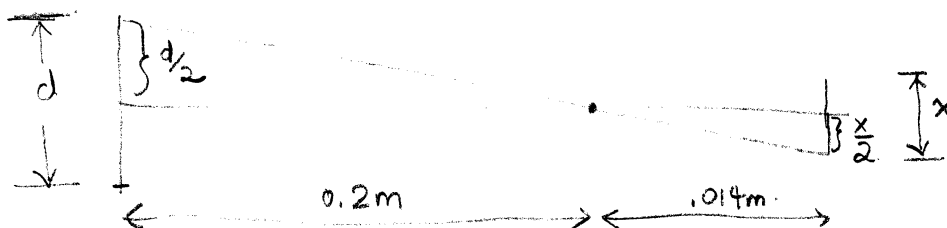
EEAP 431 Digital Image Processing

Reading Assignment Chapter 1, 2.1, 2.2, 2.3, 2.4

HW Assignment: 2.1, 2.2, 2.5

spatial resolution neighborhoods

2.1

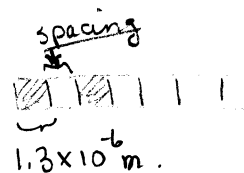


fovea as square sensor w/ 337,000 elements
or 580×580

similar triangles $\frac{d/2}{0.2} = \frac{x/2}{0.014}$

or $x = .07d$

size of each element 1.5mm long.



then $.07d < 1.3 \times 10^{-6}$
or $d < 18.6 \times 10^{-6} \text{ m}$

2.2. $f(x,y) = i(x,y) r(x,y) = 255 e^{\frac{(x-x_0)^2 + (y-y_0)^2}{2m}}$

quantized we get $\Delta G = \frac{255+1}{2^m}$

see p.211, Fig. 4.36

p.40

edges require fine sampling

eye poor at estimating shades of gray near edge.

problem is how to represent 1 gray level.

$$\Delta G = \frac{255+1}{2^m}$$

want $8 = \Delta G = \frac{256}{2^m}$ or $m = 8$.

$\Rightarrow$

Connectivity

2.4.1 and 2.4.2.

Prob. 2.5

	S_1					S_2				
0	0	0	0	0		0	0	1	1	0
1	0	0	1	0		0	1	0	0	1
1	0	0	1	0		①	1	0	0	0
0	0	1	1	① _p		0	0	0	0	0
0	0	1	1	1		0	0	1	1	1

(a) S_1 & S_2 not 4 connected.

(b) S_1 & S_2 are 4 connected

m-connectivity is mixed connectivity.

0 1 1
0 1 0
0 0 1

(a)

0 ① ①
0 ① 0
0 0 ①

8-neighbors of center pixel

0 ① ①
0 ① 0
0 0 ①

(c)

m-neighbors.

diagonal neighbors

$N_D(p)$

four-neighbors

$N_4(p)$

eight-neighbors

$N_8(p)$

m-connectivity

m-connected

iff (i) $q \in N_4(p)$

or (ii) $q \in N_D(p)$

and $N_4(p) \cap N_4(q) \neq \emptyset$