

CS552 Homework 5

Due Thursday March 17, 2005

Problem 1

Textbook Problem 10.23. Determine the optimal segmentation threshold value under the assumption that the object and background graylevel are Rayleigh pdfs with the long tails pointing in opposite directions. Hint: substitute $-(x - a)$ for $x - a$ in the pdf that you want to flip.

Problem 2

For the integer image shown below, label each pixel A, B, etc in accordance with the connected component that it is part of. The set V specifies acceptable object gray-levels. Likewise, 4 and 8-connn refer to the connectivity to be used.

	0	1	2	3	4
0	4	2	5	1	2
1	1	1	5	3	1
2	2	8	1	5	5
3	1	4	4	1	2
4	2	1	2	4	1
5	4	4	1	1	1

V={1,2} 4-connn				

V={1,2,3} 8-connn				

For the largest connected components from above, draw the shortest path from pixel (1, 1) to all other pixels. For the 4-connn. image use the 4-distance. Likewise, for the 8-connn. image use the 8-distance.

4-connn/4-dist				

8-connn/8-dist				