UNIVERSITY OF ILLINOIS
Department of Electrical and Computer Engineering
ECE 417 Multimedia Signal Processing

Lecture 8 Sample Problem Solutions

Problem 8.1

$$\vec{w} = 2(\vec{x}_1 - \vec{x}_0), \quad b = \|\vec{x}_0\|^2 - \|\vec{x}_1\|^2$$

Problem 8.2

$$\vec{w} = \vec{u} - \vec{v}, \quad b = \ln\left(\frac{(1-\pi_0)c_1}{\pi_0 c_0}\right)$$

Problem 8.3

	If C is within this range:				
	$(-\infty, \frac{1}{5})$	$(\frac{1}{5}, \frac{1}{4})$	$(\frac{1}{4}, \frac{3}{10})$	$(\frac{3}{10}, 4)$	$(4, \infty)$
Then $h(x) = 1$ for these x:	None	4	$\{2, 4\}$	$\{0, 2, 4\}$	All

Problem 8.4

	If C is within this range:				
	$(-\infty, \frac{1}{5})$	$(\frac{1}{5}, \frac{1}{4})$	$(\frac{1}{4}, \frac{3}{10})$	$(\frac{3}{10}, 4)$	$(4, \infty)$
Then Bayes risk is:	$0.5C$	$0.4C + 0.02$	$0.2C + 0.07$	$0.1C + 0.1$	0.5