
 Mansoura University	 Faculty of Engineering	Biomedical Engineering (BME) Department
		Time allowed: 1 Hour
		Exam is three pages, Full mark=30
		Assume any missing data; solve in same paper
		Include and name all steps
الفصل:		الاسم:

Question # 1: [30 points, each is 5 points] Answer the following, showing details if possible

1.1 Draw a block diagram of x-ray device

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1.2 Find distance shape map of the following image, O1, where one indicates the object

	Object training Image, O1																									
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Distance map shape model																										
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1.3 If x-ray projections of 2x2 image pixels are as follows: horizontal=[3 8], vertical=[6 5], main diagonal=[4], and reverse main diagonal = [7]. Reconstruct the image using **ART algorithm**

1.4 Compute the M-step, for the following 3x3 E-step responsibilities for the given image Y:

Image; Y

7	5	4
3	2	1
4	1	0
5	5	6

$\pi(x = 0|Y)$

1	1	0.9
1	0.1	0.2
1	0.3	0
0.5	1	1

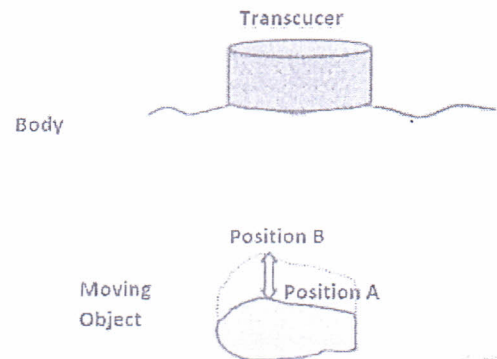
$\pi(x = 1|Y)$

0	0	0.1
0	0.9	0.8
0	0.7	1
0.5	0	0

1.5 A training image Y with three grey levels $\{0,1,2\}$ and its labeled image X has two labels "1 is object" and "0 is background". If $p(X) = [0.2 \ 0.8]$; $p(Y|X = 0) = [0.2 \ 0.3 \ 0.5]$, and $p(Y|X = 1) = [0.5 \ 0.3 \ 0.2]$, classify the following 3×3 test image, Y_1 , using the Bayes rule classifier

Test Y_1		
0	1	2
0	1	2
0	1	2

1.6 How m-mode ultrasonic is performed. How it looks for the following periodically moving structure?



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خالص اميناتي بالتوفيق

تمت الاسئلة