10SCS151



First Semester M.Tech. Degree Examination, June 2012 Advances in Digital Image Processing

Time: 3 hrs. Max. Marks:100			arks:100	
Note: Answer any FIVE full questions.				
1	a. b. c.	With a block diagram, explain the fundamental steps in digital image processing. Describe the Laplacian operator for line detection in an image. Explain the sobel operator.	(10 Marks) (06 Marks) (04 Marks)	
2	a. b. c.	Describe the image sampling and quantization process. Explain the terms spatial resolution and intensity resolution. Explain the various adjacencies between pixels and distance measures between p in digital images. Give examples.	(05 Marks) (05 Marks) bixels used (10 Marks)	
3	a. b. c.	How arithmetic and logical operations are applicable in an image enhancement? Explain spatial image smoothing operation. Why it is required? Describe image histogram and histogram equalization and use of equalization.	(08 Marks) (06 Marks) (06 Marks)	
4	a.	Explain image smoothing in frequency domain using Gaussian and Butterworth fil	filters.	
	b.	Explain image sharpening in frequency domain using Gaussian and Butterworth fi	(06 Marks) lters.	
	c.	What are homomorphic filters?	(00 Marks) (04 Marks)	
5	a. b.	Explain the image degradation model, with a diagram. Describe the various noise models available. Draw the noise probability density	(04 Marks) functions. (12 Marks)	
6	a. b. c.	Explain RGB and HSI color models. How HSI to RGB conversion is done? Explain 2 dimensional discrete wavelet transform with a suitable diagram. Explain discrete cosine transform.	(04 Marks) (06 Marks) (06 Marks)	
7	a. b.	Encode the sequence b a r r a y a r b b a r b b y b b a r r a y a r b b a y u algorithm. Assume window size = 30, look ahead buffer size = 15; c(a) = 1, c(b) = 3, c(r) = 4, c(\eta) = 5. Explain differential pulse code modulation with a diagram.	sing L277 c(b) = 2, (07 Marks) (07 Marks)	
c	C.	Explain the arithmetic coding, with an example.	(U6 Marks)	
8	a. b. c.	Explain dilation and erosion process in image morphology. Explain matching scheme for edge detection. Explain region growing and region splitting-merging scheme of region based seg	(06 Marks) (06 Marks) mentation. (08 Marks)	