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Paper code - P119-141 (ESE)

DECEMBER 2019 / END-SEM

F. Y. M. TECH. (Signal Processing) (SEMESTER - I)

Image and Video Processing (ETPA11181)

(PATTERN 2018):- R1

Time: [3 Hour]

[Max. Marks: 50]

(*) Instructions to candidates:

- 1) Answer Q.1, Q.2, Q.3, Q.4 OR Q.5, Q.6 OR Q.7, Q.8 OR Q.9
- 2) Figures to the right indicate full marks.
- 3) Use of scientific calculator is allowed
- 4) Use suitable data where ever required

Q.1) a) Define 1) Euclidean Distance 2) Manhattan Distance and 3) Chessboard Distance (3)

OR

b) What is spatial and temporal sampling in digital video? Distinguish between analog and digital video. (3)

Q.2) a) What is homomorphic filtering? Derive the filter function for homomorphic filter. (3)

OR

b) Explain procedure of image filtering in frequency domain? Compare the performance of ideal, Butterworth and Gaussian low pass and high pass filters when used in frequency domain. (3)

Q.3) a) With reference to image compression Explain 1) Coding redundancy and 2) Psychovisual redundancy (2)

OR

b) In video compression why RGB image is converted into YCbCr colour space. What is 4:2:0 format used while compressing the videos. (2)

Q.4) a) Define Segmentation. What is similarity based approach. (6)
Explain any one similarity based approach with suitable example.

b) What is the role of illumination in segmentation by thresholding? Explain Optimal thresholding technique. (8)

OR

Q.5) a) Explain the algorithm for detecting threshold automatically in basic thresholding technique used in image segmentation. (6)

b) Explain in detail Hough transform used for linking straight edges. (8)

Q.6) a) Compare image enhancement and restoration in detail. (6)

b) With suitable block diagram explain the image restoration process in spatial and frequency domain. (8)

OR

Q.7) a) What are colour models? Compare RGB and HSI colour models with their applications. (6)

b) List different types of noises normally occurred during acquisition and transmission of images. How noises in images are determined? (8)

Q.8) a) Explain with suitable example following operations used in morphological image processing. (6)

- 1) Dilation
- 2) Erosion
- 3) Opening
- 4) Closing

b) The binary image X and the structuring element B is given below. (8)

	0 0 0 0		0 1 0
X=	0 1 1 0	B=	1 1 1
	0 1 1 0		0 1 0
	0 0 0 0		

Perform the dilation and erosion operation.

OR

Q.9) a) What is texture analysis? What are the different parameters used for texture analysis, explain in brief. (6)

b) What is chain code? With suitable example explain how chain codes are used in boundary representation. (8)