



SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : (16EC3808) IMAGE & VIDEO PROCESSING

Course & Branch: M.Tech - DECS

Year & Sem: I-M.Tech & II-Sem

Regulation: R16

UNIT -I

IMAGE REPRESENTATION

1. (a) Differentiate the features of gray scale and color image.
(b) State and prove following properties of 2D DFT:
(i) Conjugate symmetry (ii) Frequency translation
2. (a) Derive Haar transform kernel matrix for $N = 4$.
(b) Explain image sampling and quantization with neat sketch
3. (a) Explain histogram equalization method of image enhancement
(b) Explain translation, rotation, scaling and labeling with respect to image
4. (a) What is meant by digital image processing? Explain how the image can be digitized?
(b) List out the example field using DIP
5. a) Compute the inverse of 2D DFT of the transform given is:

$$F(u, v) = \begin{bmatrix} 64 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

- (b) State and prove spatial scaling property of 2D DFT.
6. (a) Describe the functions of elements of digital image processing system with a diagram.
(b) What is meant by image processing? Distinguish between gray scale and color image
7. (a) Obtain 2D DFT matrix for $N = 4$.
(b) Discuss the implementation fast Walsh transform. How it is different from FFT
8. (a) What is meant by unitary transforms? Explain the properties of 2-D orthogonal and unitary transforms
(b) Discuss the role of DCT in image processing.
9. (a) What is meant by image sampling and quantization?
(b) State and prove separability property of 2D – DFT
10. a) Analyze the concepts of sampling and quantization by considering the digital image as input.
(b) Obtain 2D DFT matrix for $N = 4$.

Prepared by: T.Uma maheswari



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UNIT –II

IMAGE ENHANCEMENT

1. (a) Explain the method of homomorphic filtering in image enhancement.
(b) Discuss about different types image sharpening techniques.
2. (a) Distinguish between spatial and frequency domain filtering techniques for image enhancement.
(b) Explain histogram equalization method of image enhancement.
3. (a) Draw the block diagram of homomorphic filtering & Explain.
(b) What is LOG filter? How LOG filter is advantageous than Laplacian filter?
4. (a) Explain the enhancement by point processing.
(b) Discuss the localization problem in image enhancement.
5. (a) What is histogram? Compute the gray level histogram of an output image obtained by enhancing the input image using the histogram equalization techniques
(b) Explain edge detection using gradient operators
(c) Briefly explain about LOG filters
6. Discuss different types of non-linear grey level transformations for image enhancement.

Gray Level	0	1	2	3	4	5	6	7
Histogram	400	700	1350	2000	3000	1500	550	0

7. (a) Explain edge detection using gradient operators
(b) Explain about different image edge detection methods.
8. Discuss the following with respect to image enhancement:
 - (i) High boost filtering.
 - (ii) Unsharp masking.
 - (iii) Bit plane slicing
 - (iv) Log Transformations
9. (a) Analyze 3 X 3 mean filter in the frequency domain and prove that it behaves like a low pass filter
(b) Show that histogram equalization method gives uniform histogram for continuous images.
10. (a) Discuss the role of logic operations in enhancement of an image.
(b) Explain in detail about piece-wise linear transformations

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UNIT –III

IMAGE RESTORATION

1. (a) Explain the method of image restoration using inverse filtering
(b) Explain the application of circulant and block circulant matrices in restoration
2. (a) Explain the degradation model of image restoration.
(b) Discuss Wiener filtering in image restoration & compare it with inverse filtering.
3. (a) What is point spread spectrum? Explain circulant & block circulant matrices
(b) Explain the maximum entropy based method of image restoration.
4. (a) Discuss about ID degradation model.
(b) Explain about unconstrained approach of image restoration.
5. (a) Discuss fundamental coding theorem.
(b) Discuss the role of Wiener filtering in image restoration.
6. (a) Explain Bi-level thresholding.
(b) Discuss the method of region growing.
7. (a) Explain the detection of discontinuities.
(b) Discuss the application of Hough transform
8. (a) Describe the image restoration model.
(b) Discuss the concept of inverse filtering
9. (a) Explain different thresholding methods.
(b) Discuss about Hough transform.
10. (a) What is meant by image segmentation? Explain various edge detection techniques for image segmentation.
(b) Explain region growing technique of image segmentation

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UNIT -IV

IMAGE COMPRESSION

1. (a) Explain the role of Huff man's coding with an illustration.
(b) Describe error free compression method with the help of neat schematic.
2. (a) Explain the Lossy compression model with suitable block diagram.
(b) Explain the fundamental coding theorem.
3. (a) Explain bit plain coding, extract the bit plane of 3X3 image shown below.

20	30	40
20	30	40
10	20	30

- (b) Calculate the efficiency & compression ratio of Huffman coding for the "MUMMY". a) Explain run length coding with example.
4. a) Explain run length coding with example.
(b) Explain the transform coding with neat sketch
5. With reference to image compression explain the following:
Lossless compression (ii) Transform coding
6. (a) What is the need for image compression?
(b) How psycho visual redundancy is different from other redundancies.
(c) What is the need for channel encoding?
7. (a) Obtain the Huffman code for the word COMMITTEE.
(b) Describe about JPEG 2000.
8. (a) Explain about arithmetic coding technique with an example.
(b) Write short notes on at least any three image compression standards.
9. (a) Describe about transform domain coding.
(b) What are the drawbacks of arithmetic coding?
10. (a) What is the concept of Thresholding? Explain about adaptive thresholding.
(b) How to compress an image? Explain.

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UNIT –V

VIDEO PROCESSING

1. (a) Explain the basics of video image processing.
(b) Explain the features of spatio-temporal sampling
2. (a) List out the video coding standard.
(b) What are the specific features of video flittering?
3. Write short notes on:
 - (i) Video filtering
 - (ii) Video coding standards.
4. (a) Explain the representation of digital video.
(b) Discuss about motion estimation
5. Write short notes on:
 - (i) Video compression.
 - (ii) Video coding standards
6. (a) Discuss few applications of digital video.
(b) Explain about motion estimation criteria.
7. Draw the block diagram video compressionsystem and explain functionality of each block.
8. a) Explain about digital video signal.
(b) Discuss about deformable block matching
9. Discuss about MPEG – 1 standard in detail.
- 10.(a) Define vector quantization. How is it needed in coding of video signals?
(b) Explain about video coding standards

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