

Syllabus for MSE : Unit 1,2,4 (or) Unit 1,2,5

New Chapters for SEM END : Units 3,6 and 4 or 5

Unit 1 Introduction

1. Concept of digital image processing,
2. steps in image processing,
3. components of image processing system,
4. Applications areas

Unit 2 Digital Image Fundamentals

1. Image sensing and acquisition,
2. Basic concept of sampling and quantization,
3. representations of digital image,
4. spatial and grey level resolution,
5. zooming and shrinking of image,
6. Basic relationship between pixels.

Unit 3 Colour Image Processing

1. Colour fundamentals,
2. colour models,
3. RGB colour model,
4. CMY colour model,
5. HSI colour model,
6. pseudo-colour image processing: intensity slicing,
7. grey level to colour transformation

Unit 4 Edge Detection And Segmentation

1. Detection of discontinuities: point,
2. line and edge detection,
3. Thresholding, Region based segmentation

Unit 5 Image Enhancement In Spatial Domain

1. Basic grey level transformations,
2. image negation,
3. log transformations,
4. power law transformations,
5. piece wise linear transformations,
6. histogram processing,
7. histogram equalization,
8. histogram matching,
9. Image enhancement using arithmetic and logical operations

Unit 6 Object Recognition

1. Patterns and Pattern Classes,
2. Recognition Based on Decision-Theoretic Methods,
3. Matching, Optimum Statistical Classifiers,
4. Structural Methods,
5. Matching Shape Numbers,
6. String Matching.

1. Explain the following mathematical operations on digital images
 - a. Array versus Matrix operations
 - b. Linear versus Nonlinear Operation
2. Explain the procedure for converting colors from RGB to HIS and vice versa
3. Write short note on Web safe colors
4. What is the purpose of color model? Explain
5. Explain the region-based approaches to image segmentation
6. Explain image segmentation based on similarity with the help of examples.
7. Explain image segmentation based on dissimilarity with the help of examples.

Thresholding

1. Discuss the image acquisition using a single sensor, sensor strips and sensor arrays
2. Define D4 and D8 distances.
3. Define brightness, hue and saturation. Resolution pixel
4. Define Image Enhancement. Explain the following Enhancement operations and draw the graphs if transformation function:
 - a. Bit plane slicing
 - b. Grey level slicing

Assignment 7

(These are Unit 3 Questions)

1. Explain CMY and CMYK color models.
2. Interpret in detail about:
 - a. RGB model
 - b. Hsi model
3. Discuss the procedure for conversion from RGB color model to HSI color model.
4. Discuss the concept of converting colors from RGB to HSI.
5. Write short notes on RGB to CMY conversion.
6. What is Pseudo color image processing?
7. Explain the procedure of converting colors from HSI to RGB

Assignment 8

(These are Unit 4 Questions)

1. What is meant by image segmentations? Give two applications of image segmentation
2. Classify the types of edges in the digital image.
3. List and explain the various methods of thresholding in image segmentation.
4. Differentiate between local and global thresholding technique for image segmentation
5. Evaluate the advantages and disadvantages of using more than one seed in a region growing technique
6. Explain region based segmentation technique.
7. Illustrate region based segmentation and region growing with examples
8. Discuss about region based image segmentation techniques.
9. Explain the detection of isolated points in an image.
10. Explain the basics of intensity thresholding in image segmentation.
11. Explain point detection ,edge detection ,line detection in image segmentation.

Assignment 9

(These are Unit 6 Questions)

1. Explain the pattern and pattern classes in object recognition
2. Explain Matching
3. Explain Optimum Statistical Classifiers,
4. Explain Structural Methods,
5. Explain Matching Shape Numbers,
6. Explain String Matching.

Old Questions start from here: (Don't do RED Colored questions)

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From Here : Assignment 3

What is meant by Digital Image Processing? Explain how digital images can be represented?

What are the fundamental steps in Digital Image Processing?

What are the components of an Image Processing System?

Explain the process of image acquisition.

Explain about image sampling and quantization process

State and explain various applications of digital image processing.

6. Explain application of imaging which uses:

- a. Gamma---Rays
- b. X---Ray
- c. Ultraviolet
- d. Visible and Infrared band
- e. Microwave band
- f. Radio band

Define spatial and gray level resolution. Explain about iso preference curves

Explain about the basic relationships and distance measures between pixels in a digital image.

Explain the principle of sampling and quantization. Discuss the effect of increasing the

a) Sampling frequency

b) Quantization levels on image

Assignment 4

3. How to measure distance between two pixels in an image? Explain with the help of example.

4. Explain with example a) Neighbors of pixel b) Connectivity.

5. What is m---connectivity among pixels? Give an example.

1. Explain relationship amongst the pixel.

2. Explain type of connectivity in pixels using example.

3. . Explain types of path and distance with examples.

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Assignment :

9. Explain image arithmetic with example.

10. Explain logical operation on images. Give its application.

11. Explain set operation on images.

1. Write note on following, also give its application:

a. Image Negatives

b. Log Transformations

c. Power---Law Transformations

d. Contrast stretching

e. Intensity---level slicing

f. Bit---plane slicing

g. Histogram processing

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7. Explain the types of gray level transformation used for image enhancement

10. What do you mean by contrast stretching? Explain using one example.

What is meant by image enhancement by point processing? Discuss any two methods in it.

Define histogram of a digital image. Explain how histogram is useful in image

enhancement?

Write about histogram equalization.

What is meant by image subtraction? Discuss various areas of application of image subtraction.

What is meant by image averaging? Discuss various areas of application of image averaging.