SNS COLLEGE OF TECHNOLOGY
(An Autonomous Institution)
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

19ECE301-IMAGE PROCESSING AND COMPUTER VISION
Two Mark Questions and Answers
UNIT II

IMAGE ENHANCEMENT TECHNIQUES

1. What is Image Enhancement?
Image enhancement is to process an image so that the output is more suitable for specific application.

2. Name the categories of Image Enhancement and explain?
The categories of Image Enhancement are
1. Spatial domain
2. Frequency domain
Spatial domain: It refers to the image plane, itself and it is based on direct manipulation of pixels of an image.
Frequency domain techniques are based on modifying the Fourier transform of an image.

3. What do you mean by Point processing?
Image enhancement at any Point in an image depends only on the gray level at that point is often referred to as Point processing.

4. Explain Mask or Kernels?
A Mask is a small two-dimensional array, in which the value of the mask coefficient determines the nature of the process, such as image sharpening.

5. What is Image Negatives?
The negative of an image with gray levels in the range [0, L-1] is obtained by using the negative transformation, which is given by the expression.
s = L-1-r
Where s is output pixel.
r is input pixel.

6.Define Histogram?
The histogram of a digital image with gray levels in the range [0, L-1] is a discrete function h (rk) = nk, where rk is the kth gray level and nk is the number of pixels in the image having gray level rk.

7. Define Derivative filter?
For a function f (x, y), the gradient f at co-ordinate (x, y) is defined as the
vector_f = _f/_x
_f/_y
_f = mag (_f) = {[(_f/_x) 2 +(_f/_y) 2]} ½

8. Explain spatial filtering?
Spatial filtering is the process of moving the filter mask from point to point in

an image. For linear spatial filter, the response is given by a sum of products of the filter coefficients, and the corresponding image pixels in the area spanned by the filter mask.

9. Define averaging filters?
The output of a smoothing, linear spatial filter is the average of the pixels contain in the neighborhood of the filter mask. These filters are called averaging filters.

10. What is a Median filter?
The median filter replaces the value of a pixel by the median of the gray levels in the neighborhood of that pixel.

11. What is maximum filter and minimum filter?
The 100th percentile is maximum filter is used in finding brightest points in an image. The 0th percentile filter is minimum filter used for finding darkest points in an image.

12. Define high boost filter?
High boost filtered image is defined as
HBF= A (original image)-LPF
= (A-1) original image + original image –LPF
HBF= (A-1) original image +HPF

13. State the condition of transformation function s=T(r)
1. T(r) is single-valued and monotonically increasing in the interval 0_r_1
0_T(r) _1 for 0_r_1.

14. Write the application of sharpening filters?
1. Electronic printing and medical imaging to industrial application
2. Autonomous target detection in smart weapons.

15. Name the different types of derivative filters?
1. Perwitt operators
2. Roberts cross gradient operators
3. Sobel operators

16. What is enhancement.
Image enhancement is a technique to process an image so that the result is more suitable than the original image for specific applications;

17. What is point processing.
Enhancement at any point in an image depends only on the gray level at that point is referred to as point processing.

18. What is gray level slicing.
Highlighting a specific range of gray levels in an image is referred to as gray level slicing. It is used in satellite imagery and x-ray images.

19. What is histogram equalization?
It is a technique used to obtain linear histogram . It is also known as histogram linearization. Condition for uniform histogram is Ps(s) = 1.

20. What is contrast stretching?
Contrast stretching reduces an image of higher contrast than the original by darkening the levels below m and brightening the levels above m in the image.

21. Define image subtraction.
The difference between 2 images f(x,y) and h(x,y) expressed as,

G(x,y)=f(x,y)-h(x,y) is obtained by computing the difference between all pairs of corresponding pixels from f and h.

22. What is the purpose of image averaging?

An important application of image averaging is in the field of astronomy, where imaging with very low light levels is routine, causing sensor noise frequently to render single images virtually useless for analysis.

23. What is meant by masking?

Mask is the small 2D array in which the values of mask co-efficient determines the nature of process.

The enhancement techniques based on this type of approach is referred to as mask processing.

24. Give the formula for log transformation

S=clog(1+r)

Where c- constant and r≥0

25. What is meant by bit plane slicing?

Instead of highlighting gray level ranges, highlighting the contribution made to total image appearance by specific bits might be desired. Suppose that each pixel in an image is represented by 8 bits. Imagine that the image is composed of eight 1-bit planes, ranging from bit plane 0 for LSB to bit plane 7 for MSB.