SNS COLLEGE OF ENGINEERING

AN AUTONOMOUS INSTITUTION

Accredited by NAAC – UGC with 'A' Grade

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UNIT – II

IMAGE ENHANCEMENT AND RESTORATION

1. Specify the objective of image enhancement technique.

The objective of enhancement technique is to process an image so that the result is more suitable than the original image for a particular application.

2. Explain the 2 categories of image enhancement.

i) Spatial domain refers to image plane itself & approaches in this category are based on direct manipulation of picture image. ii) Frequency domain methods based on modifying the image by fourier transform.

3. 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.

4. What is grey level slicing?

Highlighting a specific range of grey levels in an image often is desired. Applications include enhancing features such as masses of water in satellite imagery and enhancing flaws in x-ray images.

5. 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.

6. What is the purpose of image averaging?

An important application of image averagingis 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.

7. What is meant by masking?

Mask is the small 2-D array in which the values of mask co-efficient determines the nature of process. The enhancement technique based on this type of approach is referred to as mask processing.

10. Define histogram.

The histogram of a digital image with gray levels in the range [0, L-1] is a discrete function $h(r_k)=n_k$. r_k-kth gray level n_k-number of pixels in the image having gray level r_k.

11. What is meant by histogram equalization? $S_k = T(r_k) = \sum_{j=0}^{k} P_r(r_j) = \sum_{j=0}^{k} n_j/n$ where $k=0,1,2,....L-1$ This transformation is called histogram equalization.

12. 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.

13. 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.

23. Write the application of sharpening filters?

1. Electronic printing and medical imaging to industrial application

2. Autonomous target detection in smart weapons

24. Name the different types of derivative filters?

1. Perwitt operators 2. Roberts cross gradient operators 3. Sobel operators