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- 1.] In order to create an image which is digital, we need to convert continuous data into digital form. This conversion from analog to digital involves two processes
- 1) Sampling (digitization of co-ordinate values)
 - 2) Quantization (digitization of amplitude value)

Sampling

→ In sampling the values on the y-axis, usually amplitude are continuous but the time of x-axis is discretized

→ sampling is done prior to the quantization process

→ sampling rate determines the spatial resolution of the digitized image

→ Sampling reduces a continuous wave to a series of "tent poles" over time.

Quantization

- In quantization time or x-axis is continuous and the y-axis of amplitude is discretized
- Quantization is done after sampling process
- The quantization level determines the number of grey level in the digitized image
- Quantization reduces a continuous curve to a continuous series of stair steps that exist at regular time interval.

2] Image Processing is method to perform some operation on an image, in order to get an enhanced image or to extract some useful information from it.

Pre-Processing is common in aim is to improvement of image data that suppresses unwanted distortion or enhances some image feature importance for further processing.

→ Image pre-processing method use the considerable redundancy in images.

→ Neighbouring pixels corresponding to an object in real images have essentially the same or similar brightness value.

→ we try to collect some degradation in the image, the nature of a priority information is important.

→ We have some classification of image pre-processing method exist which helps in understanding the image.

3] Digital image processing is use to a digital computer to process digital image through in algorithm.

In image Analysis is the extraction of meaningful information from images, mainly from digital images by means of digital image processing

techniques.

Image analysis task can be as simple as reading bar coded tags or a different identify a person from their face.

Yes image analysis is for better building because its has application in all the field like.

-) Agricultural.
-) Autonomous vehicles.
-) Forensics.
-) Security and surveillance.
-) Pollution Control
-) Traffic Control.

By this application it definitely help is further for better building.

4] Image have huge share of information. Biometrics, image processing is required for identifying an individual whose biometric image is stored in database. Faces, fingerprints, irises, etc are image based biometrics, which requires image processing and pattern recognition techniques.

The image user's biometric is fed. Nowadays, it is common to have physical and behaviour characteristics. We have seen several sectors which adopt biometric based person authentication for secure transaction. Airport entry, electronic voting, Defense sectors, secured transaction.

8) Image Representation.

In another words we can say feature extraction.

The feature extraction approaches are broadly classified as global and local approaches.

In Global Approach, ~~entire~~ entire image is used as input.

In Local Approach, portion of image is used as input.

There are different ways of feature extraction.

Global Approaches

- Principal Component Analysis
- Linear discriminant analysis.
- Texture feature
- Shape based feature
- Discrete cosine transform
- Wavelet transform and so on.

Local Approaches

- Scale invariant feature Transform
- Local Binary Pattern
- Histogram of Gradient
- Region Co-variance Matrix.