BASICS OF DIGITAL IMAGE PROCESSING

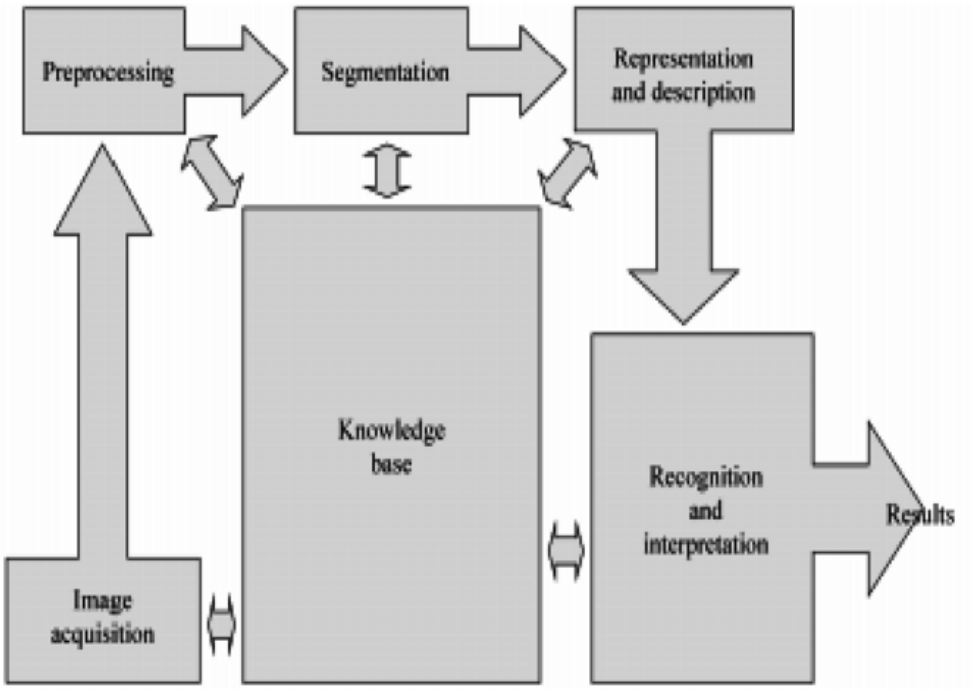
AIM

Study of basics of image processing

THEORY

Digital Image Processing means processing digital images by means of a digital computer. We can also say that it is a use of computer algorithms, in order to get enhanced images to extract some useful information.

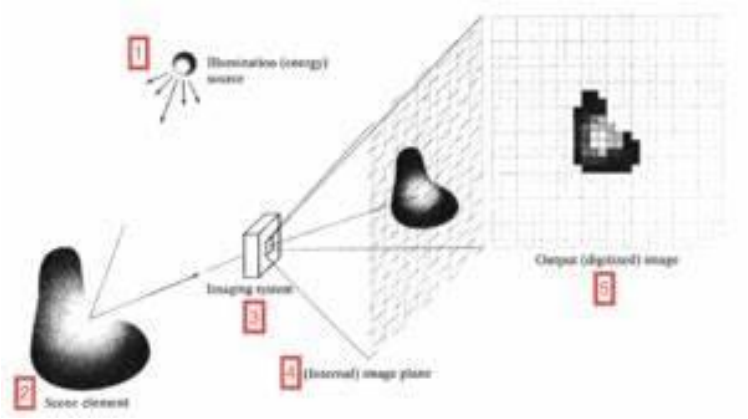
Image processing mainly include the following steps
1.Importing the image via image acquisition tools;
2.Analysing and manipulating the image;
3.Output in which the result can be an altered image or a report which is based on analyzing that image.



PHASES OF IMAGE PROCESSING:

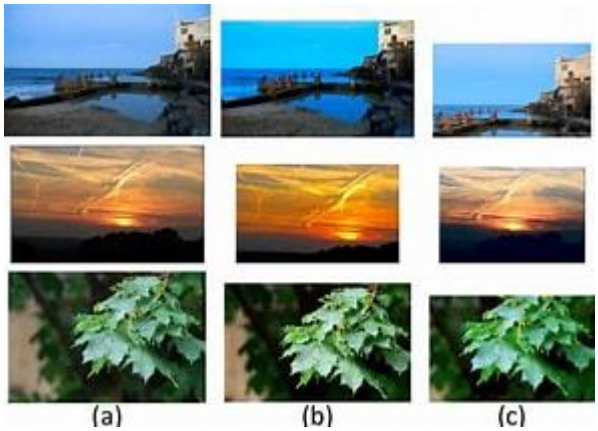
1. IMAGE ACQUISITION

The image acquisition is where you establish the parameters of your input. One of the goals in image processing is to create a source of input that works within certain defined, and measurable parameters that makes it easier to replicate an experiment.
It could be as simple as being given an image which is in digital form. The main work involves:
a) Scaling
b) Color conversion (RGB to Gray or vice-versa)



2. IMAGE ENHANCEMENT

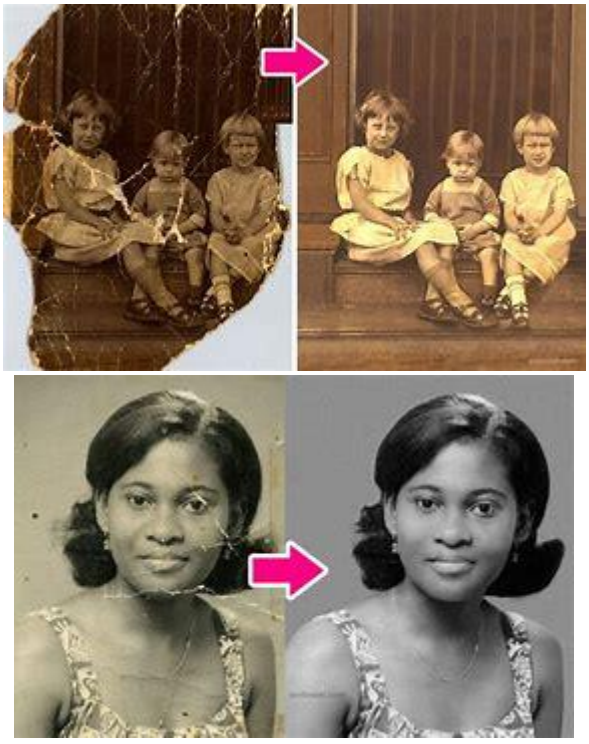
It is amongst the simplest and most appealing in areas of Image Processing. It is also used to extract some hidden details from an image and is subjective.
Image enhancement is the process of adjusting digital images so that the results are more suitable for display or further image analysis. For example, you can remove noise, sharpen, or brighten an image, making it easier to identify key features.



3. IMAGE RESTORATION–

Digital Image Processing Image restoration is the process of recovering an image that has been degraded by some knowledge of degradation function H and the additive noise term. Thus in restoration, degradation is modeled and its inverse process is applied to recover the original image.

It also deals with appealing to an image but it is objective (Restoration is based on mathematical or probabilistic model or image degradation).

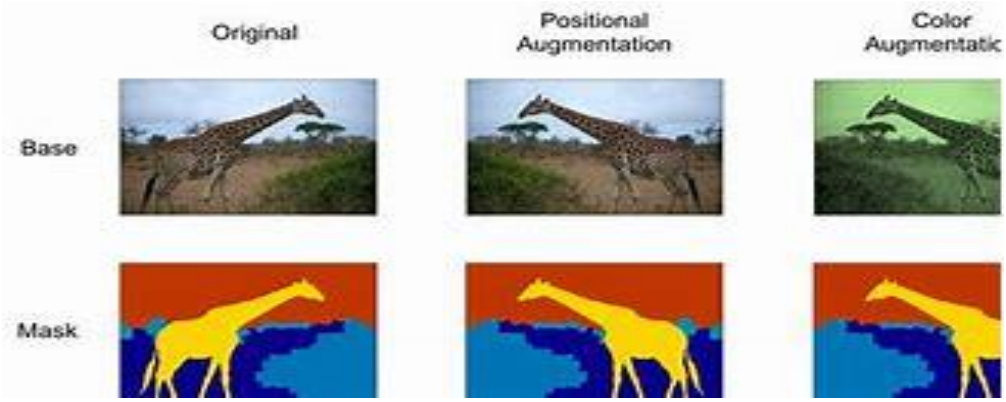


4. IMAGE COMPRESSION

It involves developing some functions to perform this operation. It mainly deals with image size or resolution.

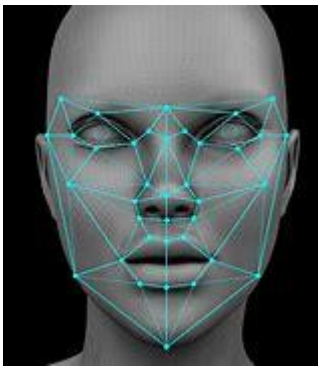
5. SEGMENTATION PROCEDURE

It includes partitioning an image into its constituent parts or objects. Autonomous segmentation is the most difficult task in Image Processing.



6. OBJECT DETECTION AND RECOGNITION

It is a process that assigns a label to an object based on its descriptor.



7. IMAGE DENOISING

With the presence of noise, possible subsequent image processing tasks, such as video processing, image analysis, and tracking, are adversely affected. Therefore, image denoising plays an important role in modern image processing systems. Image denoising is to remove noise from a noisy image, so as to restore the true image.