

Image Processing

C Deepa, G Sravanthi, B Venkataratnam

Avinash Degree College, L B Nagar

ABSTRACT:

Image processing is a method to perform some operations on an image, in order to get an enhanced image or to extract some useful information from it. It is a type of signal processing in which input is an image and output may be image or characteristics/features associated with that image. Nowadays, image processing is among rapidly growing technologies.

KEYWORDS : *Analog and Digital Images, JPEG, GIF, PNG, TIFF*

INTRODUCTION :

IMAGE: An image is a visual representation of something. In information technology, the term has several usages. An image is a picture that has been created or copied and stored in electronic form. An image can be described in terms of vector graphics or raster graphics. An image stored in raster form is sometimes called a bitmap. An image map is a file containing information that associates different locations on a specified image with hypertext links.

COMMON IMAGE FILE FORMATS ONLINE INCLUDE:

- **JPEG** (pronounced JAY-peg) is a graphic image file produced according to a standard from the Joint Photographic Experts Group, an ISO/IEC group of experts that develops and maintains standards for a suite of compression algorithms for computer image files. JPEGs usually have a .jpg file extension.
- **GIF** (pronounced JIF by many, including its designer; pronounced GIF with a hard G by many others) stands for Graphics Interchange Format. The GIF uses the 2D raster data type and is encoded in binary. GIF files ordinarily have the .gif extension.
- **PNG** (pronounced ping) is a Portable Network Graphics) is a file format for image compression that was designed to provide a number of improvements over the GIF format. Like a GIF, a PNG file is compressed in lossless fashion (meaning all image information is restored when the file is decompressed during viewing). Files typically have a .png extension.
- **TIFF** (Tag Image File Format) is a common format for exchanging raster graphics (bitmap) images between application programs, including those used for scanner images. A TIFF file can be identified as a file with a .tiff or ".tif" file name suffix.

PROCESSING: Processing is the stage where the input data is manipulated in order to produce meaningful information. Processing can include a number of stages such as sorting, searching, calculations, graphing. The results obtained from processing the data can then be used in the next stage, called "output".

INTRODUCTION TO IMAGE PROCESSING

Image processing is a method to perform some operations on an image, in order to get an enhanced image or to extract some useful information from it. It is a type of signal processing in which input is an image and output may be image or characteristics/features associated with that image. Nowadays, image processing is among rapidly growing technologies. It forms core research area within engineering and computer science disciplines too.

IMAGE PROCESSING BASICALLY INCLUDES THE FOLLOWING THREE STEPS:

- Importing the image via image acquisition tools;
- Analyzing and manipulating the image;
- Output in which result can be altered image or report that is based on image analysis.

There are two types of methods used for image processing namely, analogue and digital image processing. Analogue image processing can be used for the hard copies like printouts and photographs. Image analysts use various fundamentals of interpretation while using these visual techniques. Digital image processing techniques help in manipulation of the digital images by using computers. The three general phases that all types of data have to undergo while using digital technique are pre-processing, enhancement, and display, information extraction.

In this lecture we will talk about a few fundamental definitions such as image, digital image, and digital image processing. Different sources of digital images will be discussed and examples for each source will be provided. The continuum from image processing to computer vision will be covered in this lecture. Finally we will talk about image acquisition and different types of image sensors.

OBJECTIVES OF IMAGE PROCESSING

- To learn the fundamental concepts of Digital Image Processing.
- Understand differences between computer vision and image processing.
- Understand how images are represented; including optical images, analog images, and digital images. Understand image types such as binary images, gray-scale images, color and multi-spectral images.

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