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# Overview of Image processing and Related Fields

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**ABSTRACT**

**Computers are faster and more accurate than human beings in processing numerical data. However, human beings score over computers in reach recognition capability. The human brain is also so sophisticated that we recognise objects in a few seconds, without much difficulty. we may see a friend after 10 years, yet recognise him or her in spite of the change in his or her appearance, as the method by which humans gather knowledge for recognition is very unique. Human beings use all the five sensory organs to gather knowledge about the outside world. This perception, visual information plays a major role in understanding the surroundings. Other kinds of sensory information obtained from hearing, test, smell and touch. In this paper the origin of digital image processing and the related fields are presented.**

Key words: Image Processing, Perception, Visual System.

## I.INTRODUCTION

We encounter images everywhere in our daily lives. UC mini visual information sources such as painting and photographs in magazines, journals, image galleries, digital libraries newspapers, advertisement boards, television, and the internet. images are Virtually everywhere meaning to take digital snaps of important events in our lives and pursue them as digital albums to stop them from the distal album, we print digital pictures and male them to our friends to share our feelings of happiness and sorrow. However, images are not used only for entertainment purposes. doctors use medical images to diagnose problems for providing treatment to stop with modern technology, it is possible to image Virtually all Anatomical structures, which is of immense help to doctors, in providing better treatment. Forensic imaging applications process fingerprint scanner faces, and Chinese to identify criminals. Industrial applications used imaging technology to count and analyse industrial components. Remote Sensing applications use images sent by satellites to locate the minerals present in the Earth full stop, images find major applications in our everyday life.

## II.NATURE OF IMAGE PROCESSING

There are three scenarios or ways of acquiring an image. They are reflective mode in aging, in few type imaging, and transmissive imaging. These are illustrated in figure 1 full stop the radiation source shown in figure 1 is the light source? Can you imagine a world without likes; objects are perceived by the eye because of light. The Sun, lamps, and clouds are all examples of radiation or light sources full stop the object is the target for which the image needs to be created. The object can be payable, industrial components, or the anatomical structure of a patient. The objects can be two dimensional; three dimensional are multi-dimensional mathematical functions involving many variables. For example, a printed document is a 2D object. Most real world objects are 3D.

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**Reflective mode imaging** represents the simplest form of imaging and uses a sensor to acquire the digital image to stop all video cameras, digital cameras and scanners use some types of sensors for capturing the image. Image sensors are important components of imaging systems. They convert light energy to electrical signals.

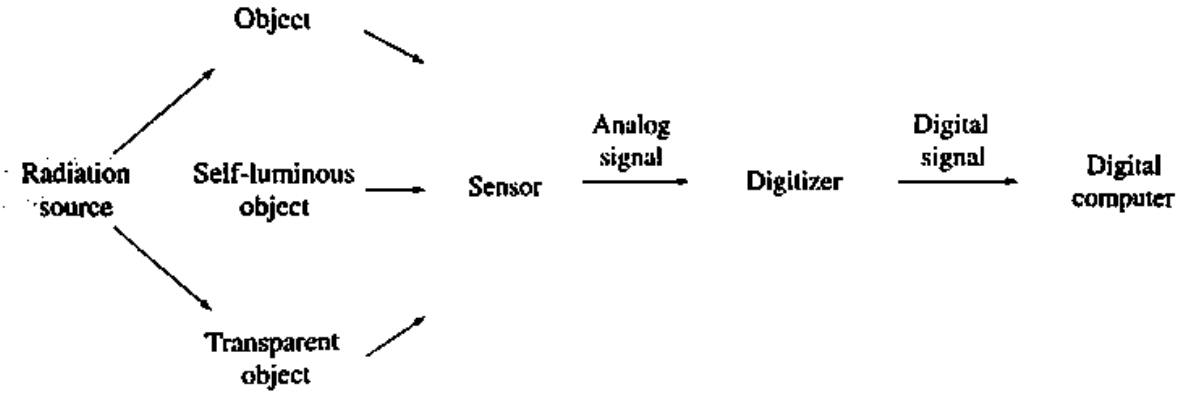


**Figure 1: Image Processing Environment**

**Emissive type imaging** is the second type, where the images are required from self-Luminous objects without the help of a radiation source. in a message type imaging, the objects are self-Luminous. The radiation emitted by the object is directly captured by the sensor to form an image. Thermal imaging is an example of MCQ type imaging. In thermal imaging, specialised thermal camera is used in low light situations to produce images of objects based on temperature. Other examples of MCQ type imaging are Magnetic resonance imaging (MRI) and position and positron emission tomography (PET).

**Transmissive imaging** is the third type with an additional source to illuminate the object. The absorption of radiation by the objects depends upon the nature of the material to stop some of the radiation passes through the objects. The attenuated radiation is censored into an image. This is called transmissive imaging. Examples of this kind of imaging are x-ray imaging, microscopic imaging, and ultrasound imaging.

The first major challenge in image processing is to acquire the image for further processing. Figure 1 show Three Types of processing optical, analogue and digital image processing. Optical image processing is the study of the relation source, the object, and other optical process involved. It refers to the processing of images using lenses and the coherent light beams instead of computers. Human beings can see only the optical image. an optical image is the 2D projection of a 3D scene. This is a continuous distribution of a light in 2D surface and contains information about the object that is in focus full stop. This is the kind of information that needs to be captured for the target image. Optical image processing is an area that deals with the object, optics and how processes are applied to an image that is available in the form of reflected or transmitted light. The optical image is said to be available in optical form still it is converted into analogue form.

An analog or continuous image is a continuous function f(x, y), where x and y are two special coordinates full stop analogue signals are characterized by continuous signals varying with time. They are referred to as pictures to stop the process that are applied to the analogue signal are called analogue process to stop analogue image processing is an area that deals with the processing of analogue electrical signals using analogue circuits. The imaging systems that use films for recording images are also known as analogue imaging systems. In medical imaging, still films are used as feelings provide better quality than the digital systems.

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The analog signal is often sampled, quantized and converted into digital form using a digitiser. Digitisation refers to the process of sampling and quantization. Sampling is the process of converting a continuous valued image f(x, y) into a discrete image computer cannot handle continuous data. So the main aim is to create a discretized version of the continuous data sampling is a reversible process, as it is possible to get the original image back. quantization is the process of converting the sample analogue value of the function f(x, y) into a discrete valued integer to stop digital image processing is an area that uses digital circuits systems and software algorithms to carry out the image processing operations stop the image processing operations may include quality enhancement of an image, counting of objects and image analysis.

## III.POPULARITY OF IMAGE PROCESSING

Image processing has become very popular now, as digital images have many advantages over analogue images. Advantages are as follows:

It is easy to post-process the image for stock; small connections can be made in the captured image using software; it is easy to store the image in the distal memory; it is possible to transmit the image over networks. So sharing an image is quite easy to stop. A digital image does not require any chemical process. So it is very environment friendly, as harmful film Chemicals are not required. it is easy to operate a digital camera.

Advantages of digital images are very few. are the problems associated with sensors such as high power consumption and potential equipment failure, and other security issues associated with the storage and transmission of additional images. Digital imaging is the technique used now, as the advantages of digital image processing outweigh the advantages. The final form of an image is the display image. I can recognise only the optical shop to stop so the digital image needs to be converted to optical form through the digital to analogue conversion process.

## IV. IMAGE PROCESSING AND RELATED FILEDS

Image processing is an existing interdisciplinary field that grows ideas freely from many fields. Figure 2 Illustrate the relationship between images processing and other related fields.

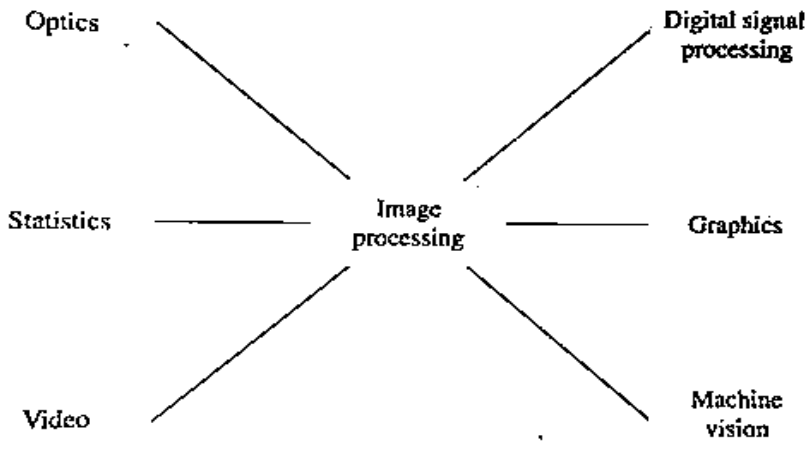


**Figure 2: Image Processing and other Related Fileds**

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### A.IMAGE PROCESSING AND COMPUTER GRAPHICS

Computer Graphics and image processing are very closely related areas to stop image processing deals with the raster data or bitmaps whereas computer graphics primarily deals with vector beta. Raster data or bitmaps are stored in 2D matrix form and often used to depict real images. Images are composed of vectors, which represent the mathematical relationships between the objects. Vectors are lines are primitive tools that are used to describe an image. after graphics are often used to represent abstract, Basic line drawings.

The organisms in computer graphics of and take numerical data as input and produce an image as output. In image processing the input is often an image. The goal of image processing is to enhance the quality of the image to assist in interpreting it.. The result of image processing is often an image or the description of an image processing is a logical extension of Computer Graphics and serves as a complementary field.

### B.IMAGE PROCESSING AND SIGNAL PROCESSING

Human beings interact with the environment by means of various signals. in Digital Signal Processing, 115 deals with the processing of one dimensional signals. In the domain of image processing, One deals with visual information that is often in two or more dimensions to stop therefore, image processing is a logical extension of signal processing.

### C.IMAGE PROCESSING AND MACHINE VISION

The main goal of mission vision is to interpret the image and to extract its physical, geometric, are logical properties., the output of image processing operations can be subjected to more techniques, to produce additional information for interpretation to stop artificial vision is a waste field, Tu Tu Main circles the first one is machine vision and second one is computer vision. The domain of mission vision includes many aspects such as lighting and camera, as part of the implementation of industrial projects, since most of the applications associated with the machine vision are automated visual inspection systems. the applications involving machine vision in to inspect a large number of products and achieve improved quality controls. Computer vision is more ambitious to stop; it tries to mimic the human visual system and is often associated with the scene understanding. Most image processing algorithms produce results that can serve as the first input for mission vision algorithms.

### D.IMAGE PROCESSING AND VIDEO PROCESSING

Image processing is about still images. In fact, analogue video cameras can be used to capture still images to stop a video can be considered as a collection of images indexed by time to stop most image processing algorithms work with video readily to stop, video processing is an extension of image processing. in addition, images are strongly related to multimedia, as the field of multimedia broadly includes the study of audio, video, images, graphics and animation.

### E.IMAGE PROCESSING AND OPTICS

Optical image processing deals with the lenses camera lightning conditions, and associated optical circuits. The study of lenses and lightning conditions as an important role in the study of image processing.

### F.IMAGE PROCESSING STATISTICS

Image analysis is an area that concerns the extraction and analysis of object information from the image to stop messaging applications involving both sample statistics such as accounting and mensuration and complex statistics such as advanced statistical inference. so statistics play an important role in imaging applications. Image understanding is an area that applies statistical inferencing to extract more information from the image.

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## V. CONCLUSION

Images are sampled and discrete mathematical functions to stop the objective of digital image processing are to improve the quality of the factorial information and to facilitate automatic mission interpretation. Image processing is a complex task because of difficulties such as illusion, loss of information, extensive knowledge requirement for interpretation, presence of noise and artefacts, amount of data involved in processing, and other considerations such as lightning. Image processing applications are present in all domains full stop digital imaging systems should have basic components for image acquisition, special hardware for faster manipulation, Special software for facilitating image applications, and a huge amount of memory card storage and input output devices.

## REFERENCES:

[1] “Digital Image Processing Using MATLAB” by Rafael C gonzalez

[2] “Digital Image Processing” by Sanjay M Shah Munesh Chandra Trivedi

[3] “Hand Book of Image and Video Processing” by Alan c Bovik