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FACULTY OF EGINEERING

Digital Image Processing
LECTURE-01

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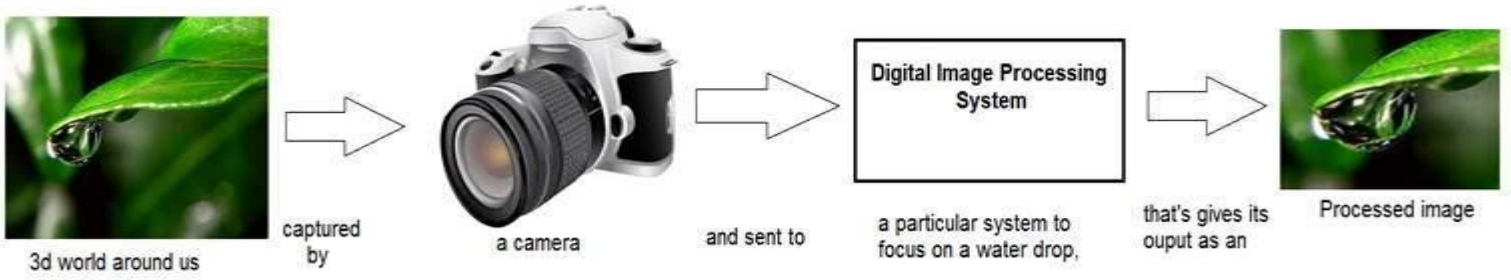
What is Digital Image Processing ?

Digital Image Processing (DIP) is a software which is used to manipulate the digital images by the use of computer system. It is also used to enhance the images, to get some important information from it.

For example: Adobe Photoshop, MATLAB, etc.

It is also used in the conversion of signals from an image sensor into the digital images.

A certain number of algorithms are used in image processing.



Digital Image Processing

- Digital Image Processing is a software which is used in image processing. For example: computer graphics, signals, photography, camera mechanism, pixels, etc.
- Digital Image Processing provides a platform to perform various operations like image enhancing, processing of analog and digital signals, image signals, voice signals etc.
- It provides images in different formats.

Digital Image Processing allows users the following tasks

- Image sharpening and restoration
- Medical field
- Remote sensing
- Machine/Robot vision

Characteristics of Digital Image Processing

Characteristics

- It uses software, and some are free of cost.
- It provides clear images.
- Digital Image Processing do image enhancement to recollect the data through images.
- It is used widely everywhere in many fields.
- It reduces the complexity of digital image processing.
- It is used to support a better experience of life.

Advantages and Disadvantages of Digital Image Processing

Advantages

- Image reconstruction (CT, MRI, SPECT, PET)
- Image reformatting (Multi-plane, multi-view reconstructions)
- Fast image storage and retrieval
- Fast and high-quality image distribution.
- Controlled viewing (windowing, zooming)

Disadvantages

- It is very much time-consuming.
- It is very much costly depending on the particular system.
- Qualified persons can be used.

Image

What is an Image?

- Practically, every scene which is around us forms an image and this involved under image processing.
- An image is formed by two-dimensional analog and the digital signal that contains color information arranged along x and y spatial axis.

Analog Image Processing

- The analog image processing is applied on analog signals and it processes only two-dimensional signals. The images are manipulated by electrical signals. In analog image processing, analog signals can be periodic or non-periodic

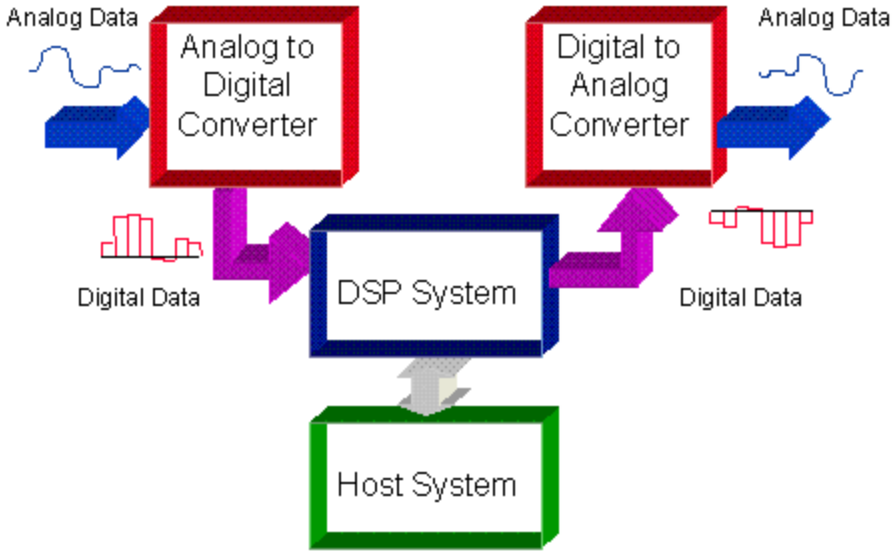
Digital Image Processing

A digital image processing is applied to digital images (a matrix of small pixels and elements). For manipulating the images, there is a number of software and algorithms that are applied to perform changes. Digital image processing is one of the fastest growing industry which affects everyone's life.

Examples of digital images are color processing, image recognition, video processing, etc.

Conversion of analog signal to digital signal by digital image processing

- Digital signal processing is all about processing analog signal or real-world signals which humans interact, for example, speech.
- DSP system converts digital signal to analog signal or vice-versa by the use of converters.



- The digital image processing is a special type of processor which is used in every electronic device whether it be CD, mobile phones, battlefields, satellites, medical, and voice detection machines etc.

Analog Image Processing vs. Digital Image Processing

Analog Image Processing	Digital Image Processing
The analog image processing is applied on analog signals and it processes only two-dimensional signals.	The digital image processing is applied to digital signals that work on analyzing and manipulating the images.
Analog signal is time-varying signals so the images formed under analog image processing get varied.	It improves the digital quality of the image and intensity distribution is perfect in it.
Analog image processing is a slower and costlier process.	Digital image processing is a cheaper and fast image storage and retrieval process.
Analog signal is a real-world but not good quality of images.	It uses good image compression techniques that reduce the amount of data required and produce good quality of images
It is generally continuous and not broken into tiny components.	It uses an image segmentation technique which is used to detect discontinuity which occurs due to a broken connection path.

MCQ

1: Which of the following applied on warehouse?

a) write only

b) read only

c) both a & b

d) none of these

2: Data can be store , retrive and updated in …

a) SMTOP

b) OLTP

c) FTP

d) OLAP

3: Which of the following is a good alternative to the star schema?

a) snow flake schema

b) star schema

c) star snow flake schema

d) fact constellation

Answer - Click Here:

4: Patterns that can be discovered from a given database are which type…

a) More than one type

b) Multiple type always

c) One type only

d) No specific type

5:Background knowledge is…

a) It is a form of automatic learning.

b) A neural network that makes use of a hidden layer

c) The additional acquaintance used by a learning algorithm to facilitate the learning process

d) None of these

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