



SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with ‘A’ Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**COURSE NAME : 19EC513 – IMAGE PROCESSING AND COMPUTER
VISION**

III YEAR / V SEMESTER

**Unit I- DIGITAL IMAGE FUNDAMENTALS AND
TRANSFORMS**

Topic : Introduction to Digital image processing system

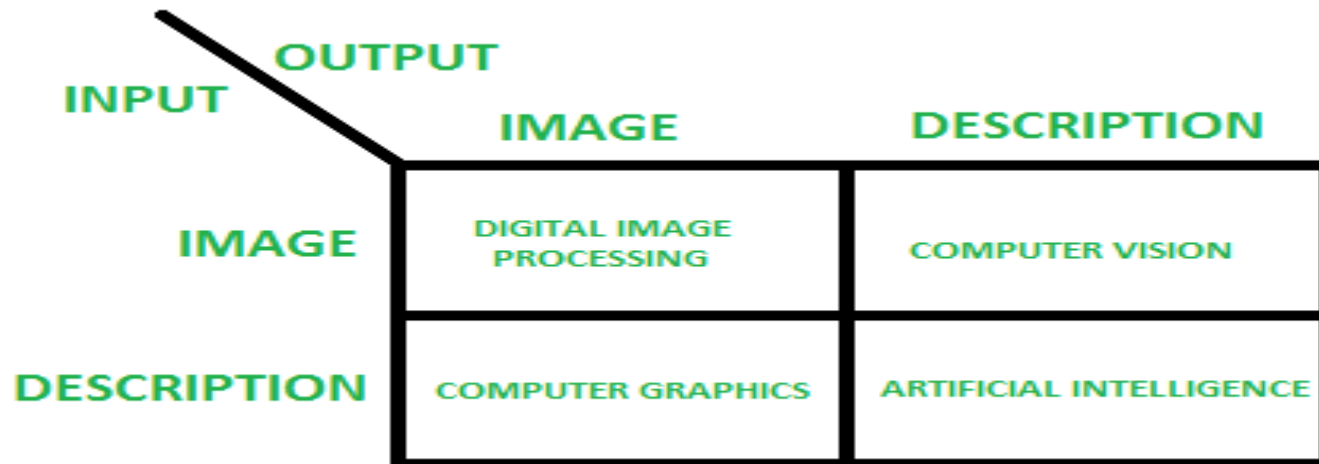
Introduction to Digital image processing system / 19EC513/ IMAGE PROCESSING AND COMPUTER VISION
/Mr.S.HARIBABU/ECE/SNSCE



Digital Image Processing

- Digital Image Processing means processing digital image by means of a digital computer.
- Digital image processing is the use of algorithms and mathematical models to process and analyze digital images.
- The goal of digital image processing is to enhance the quality of images, extract meaningful information from images, and automate image-based tasks

OVERLAPPING FIELDS WITH IMAGE PROCESSING







What is an image?

- An image is defined as a two-dimensional function, $F(x,y)$, where x and y are spatial coordinates, and the amplitude of F at any pair of coordinates (x,y) is called the **intensity** of that image at that point. When x,y , and amplitude values of F are finite, we call it a **digital image**.
- In other words, an image can be defined by a two-dimensional array specifically arranged in rows and columns.
- Digital Image is composed of a finite number of elements, each of which elements have a particular value at a particular location.
- These elements are referred to as *picture elements, image elements, and pixels*. A *Pixel* is most widely used to denote the elements of a Digital Image.



Image as a Matrix

As we know, images are represented in rows and columns we have the following syntax in which images are represented:

$$f(x,y) = \begin{bmatrix} f(0,0) & f(0,1) & f(0,2) & \dots & f(0,N-1) \\ f(1,0) & f(1,1) & f(1,2) & \dots & f(1,N-1) \\ \cdot & \cdot & \cdot & & \cdot \\ \cdot & \cdot & \cdot & & \cdot \\ \cdot & \cdot & \cdot & & \cdot \\ f(M-1,0) & f(M-1,1) & f(M-1,2) & \dots & f(M-1,N-1) \end{bmatrix}$$

The right side of this equation is digital image by definition. Every element of this matrix is called image element , picture element , or pixel.



Advantages of Digital Image Processing

- Improved image quality
- Automated image-based tasks
- Increased efficiency
- Increased accuracy

Disadvantages of Digital Image Processing:

- High computational cost
- Limited interpretability
- Dependence on quality of input
- Limitations of algorithms
- Dependence on good training data



Any Query????

Thank you.....