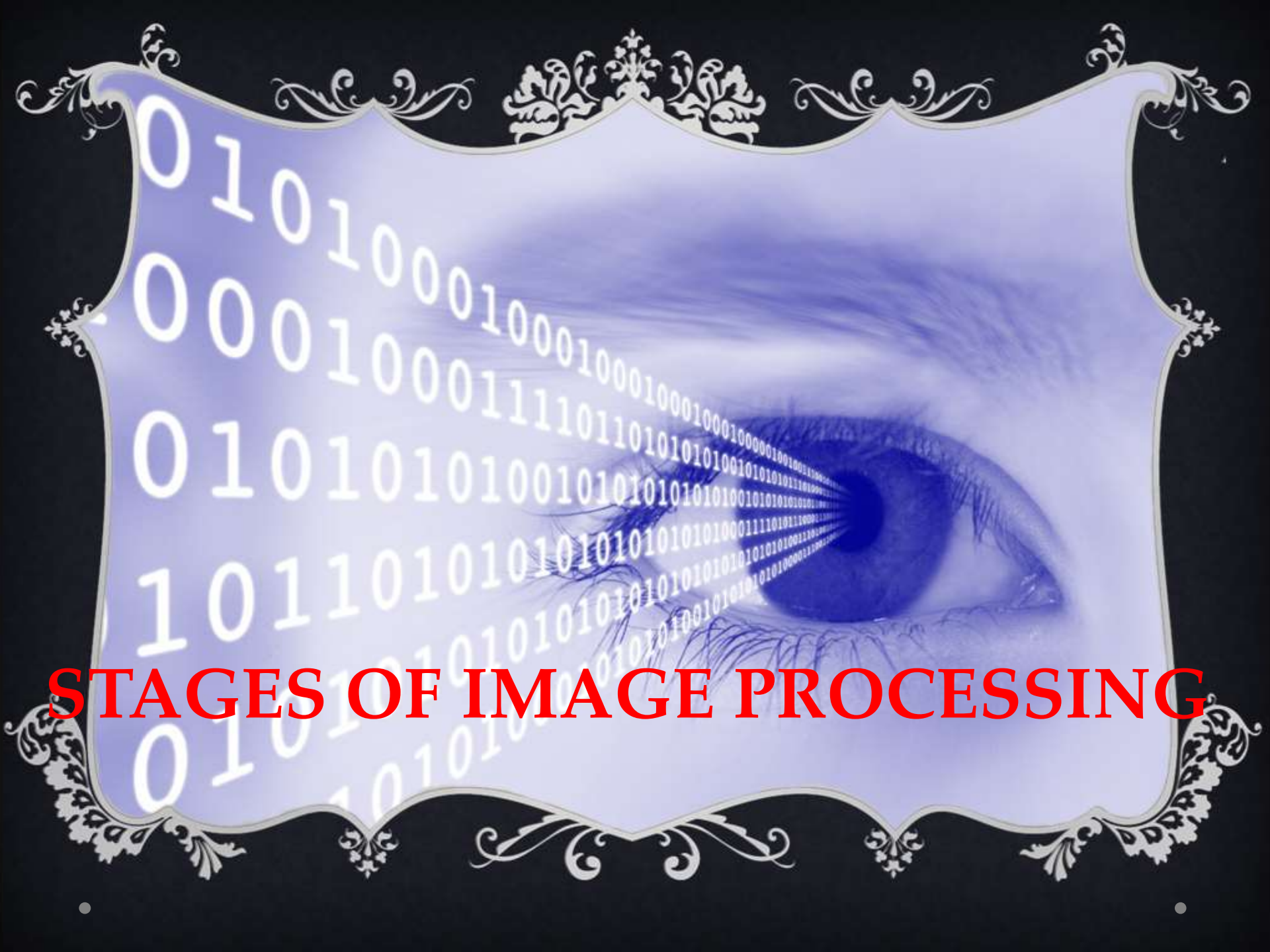

STAGES OF IMAGE PROCESSING

WHAT IS DIGITAL IMAGE PROCESSING

Digital image processing is the use of computer algorithms to perform image processing on digital images .

Key Stages in Digital Image Processing

Problem Domain

Image Acquisition

Image Enhancement

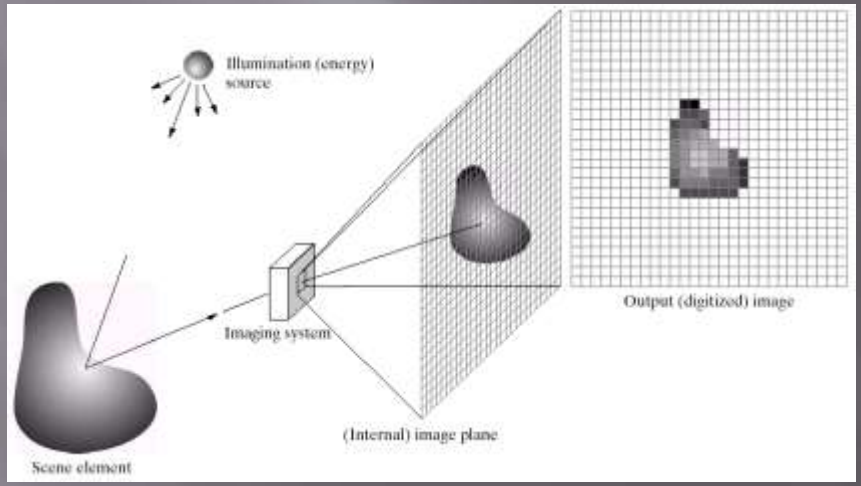
Image Restoration

Morphological Processing

Segmentation

Object Recognition

Representation & Description



Colour Image Processing

Image Compression

IMAGE ACQUISITION

A digital image is produced by one or several image sensors, which, besides various types of light-sensitive cameras, include range sensors, tomography devices, radar, ultra-sonic cameras, etc.

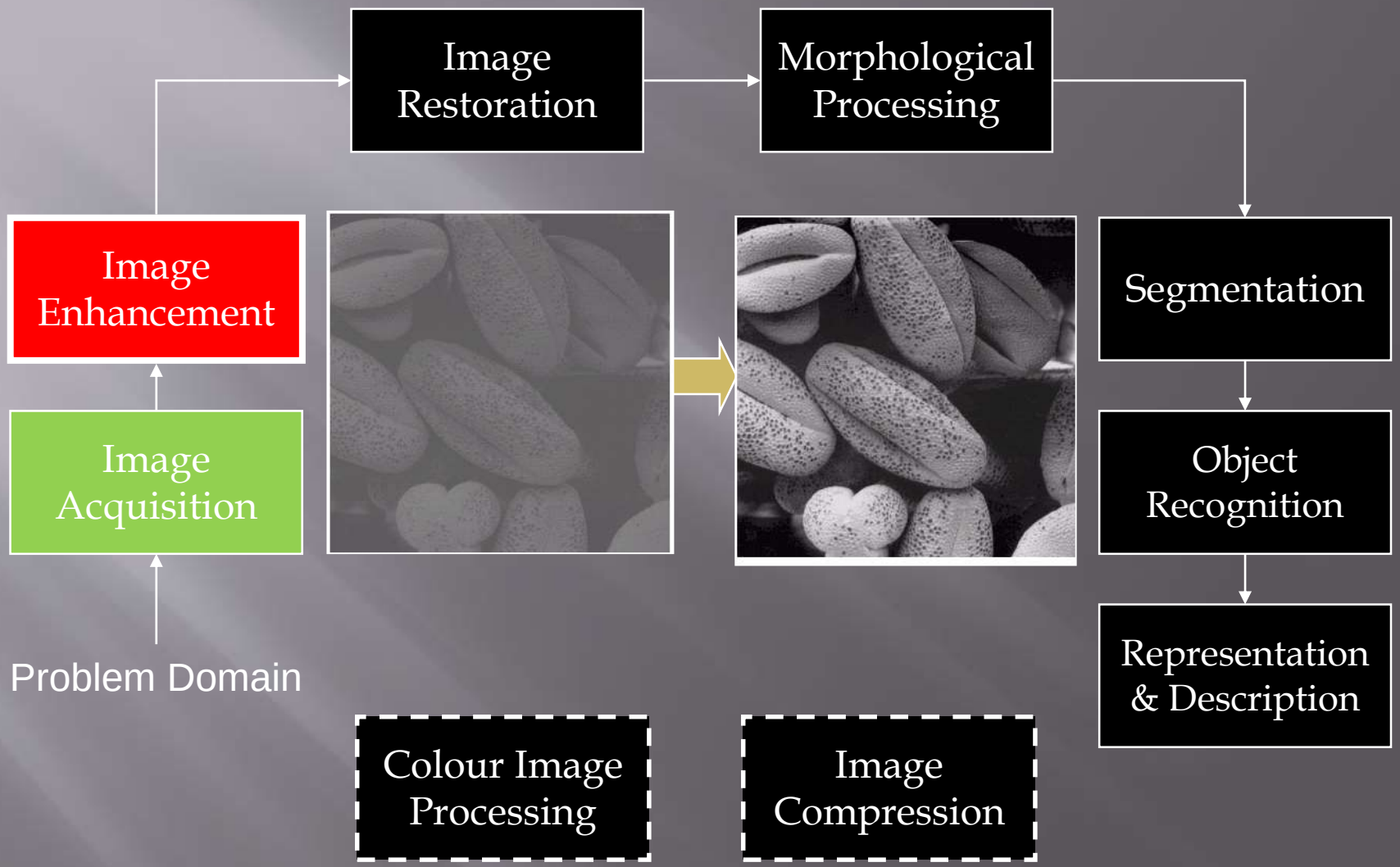


Image Restoration
Morphological Processing
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Representation & Description
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Image Compression

IMAGE ENHANCEMENT

- Used to improve the visual quality of image
- To bring out details that are hidden in image
- 2 type techniques :

  (1) Spatial domain method ,

  (2) Transform domain method

- Spatial domain method operates directly on pixels
- Transform domain method operates on the Fourier transform of an image & then transform it back to spatial domain

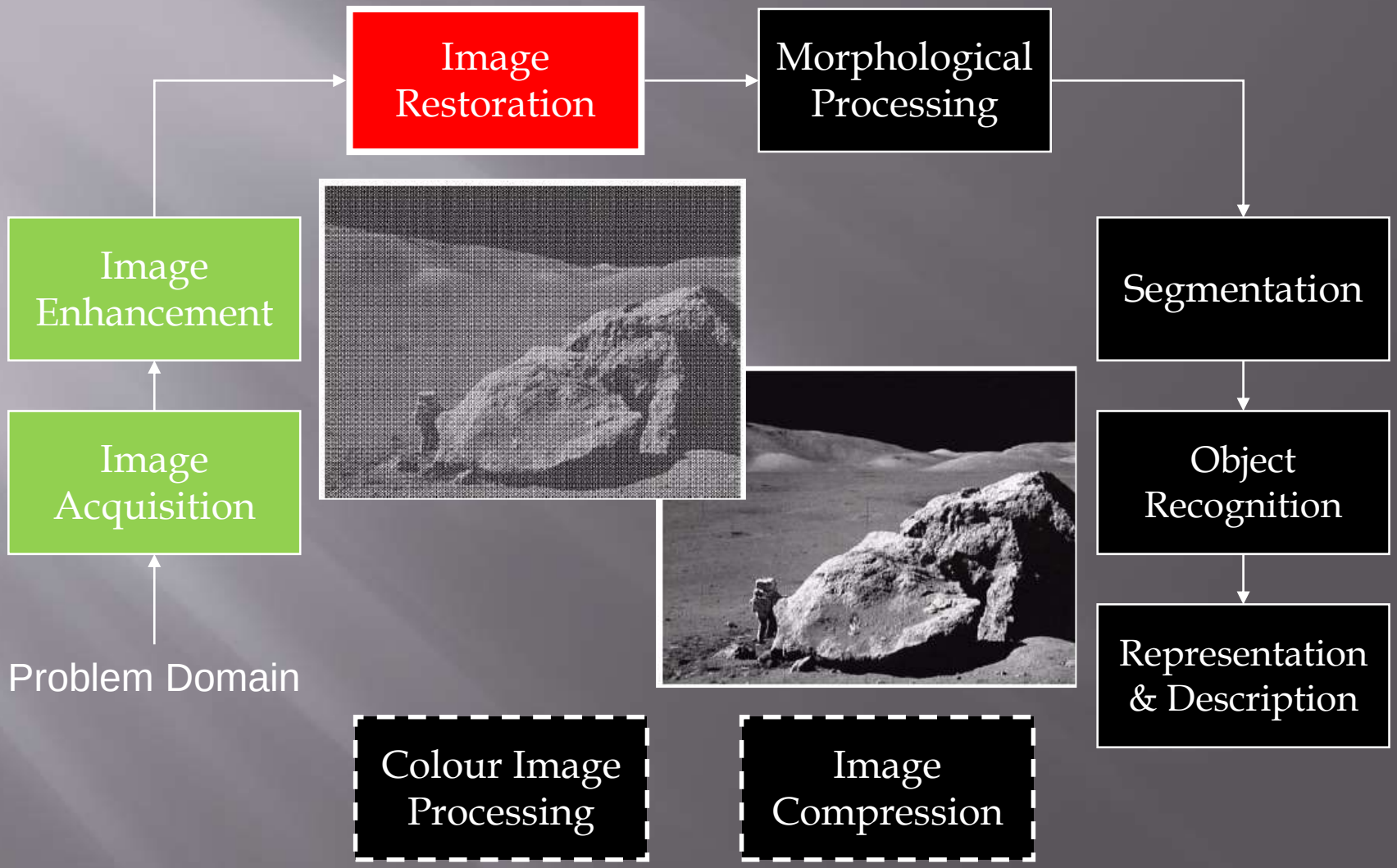
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IMAGE RESTORATION

- Used to remove the noise in the original image
- Noise occur due to camera shake ,less light etc..
- Filter are used to remove noise
- **Image restoration** is the operation of taking a corrupted/noisy **image** and estimating the clean original **image**. Corruption may come in many forms such as motion blur, noises and camera miss focus.

Image Restoration

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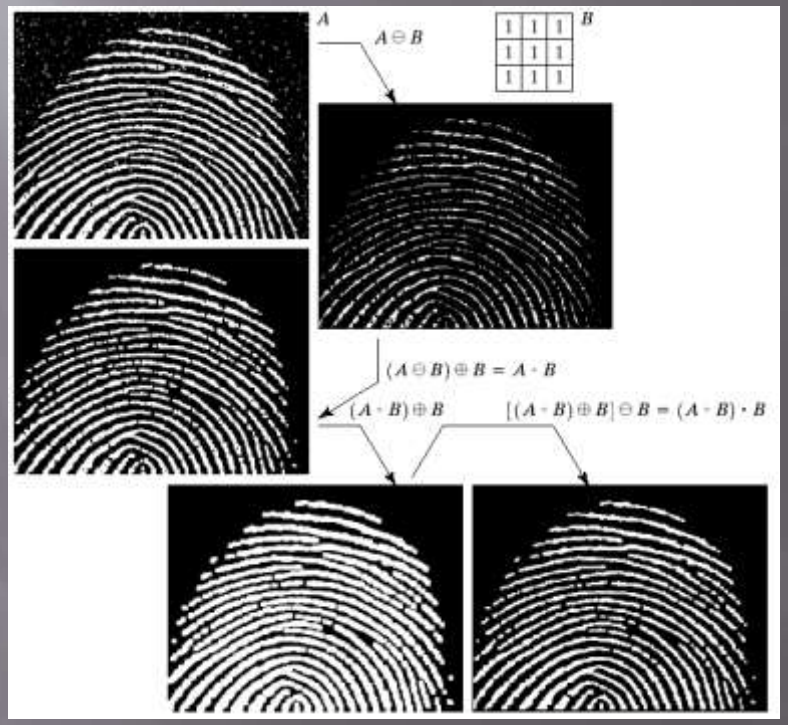
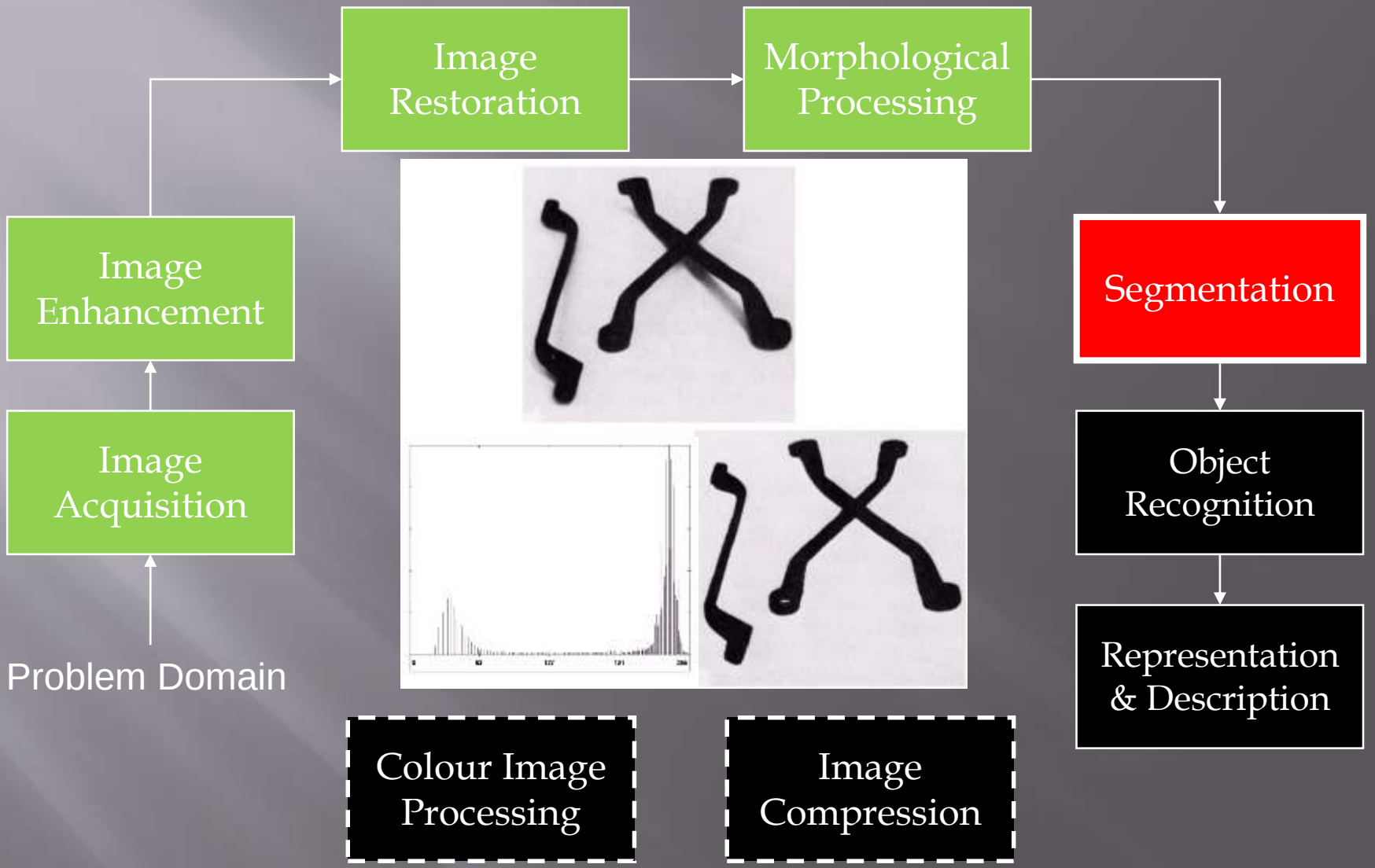


Colour Image Processing

Image Compression

MORPHOLOGICAL PROCESSING

- Tools for extracting image components that are useful in representation & description of shape
- Used for edge detection
- Is like convolution process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SEGMENTATION

- Partitioning of image into sets of pixels
- Classified as 2 techniques:

  1.Local Segmentation

  2.Global Segmentation

- **Local Segmentation**:

Segmenting sub-images which are small windows on a whole images. Number of pixel available to local seg is less than Global seg

- **Global segmentation :**

  Segmenting whole image .

- The goal of **segmentation** is to simplify or change the representation of an **image** into something that is more meaningful and easier to analyse

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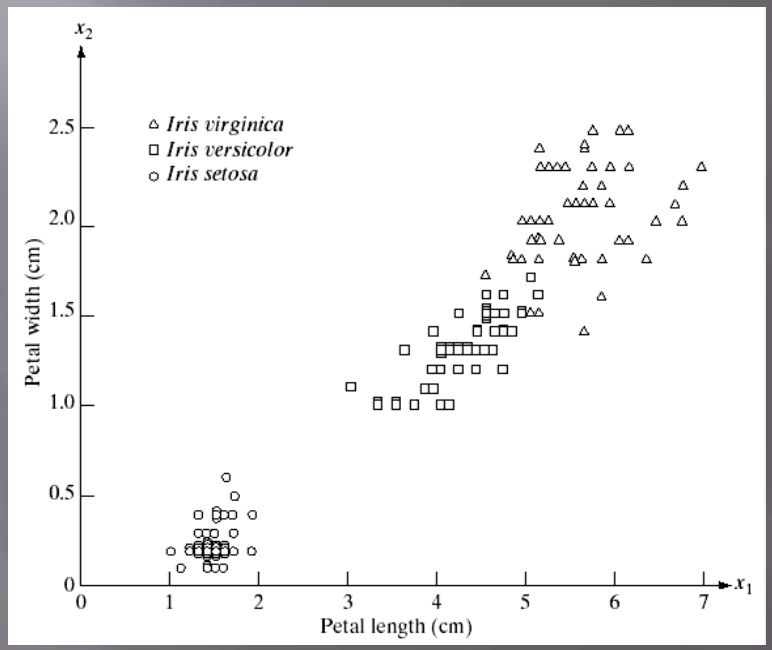

Colour Image Processing

Image Compression

OBJECT RECOGNITION

- To recognize different parts in an image
- To recognize color, shape and texture
- **Object recognition** is the ability to perceive an **object's** physical properties (such as shape, colour and texture) and apply semantic attributes to the **object**, which includes the understanding of its use, previous experience with the **object** and how it relates to others.

Problem Domain

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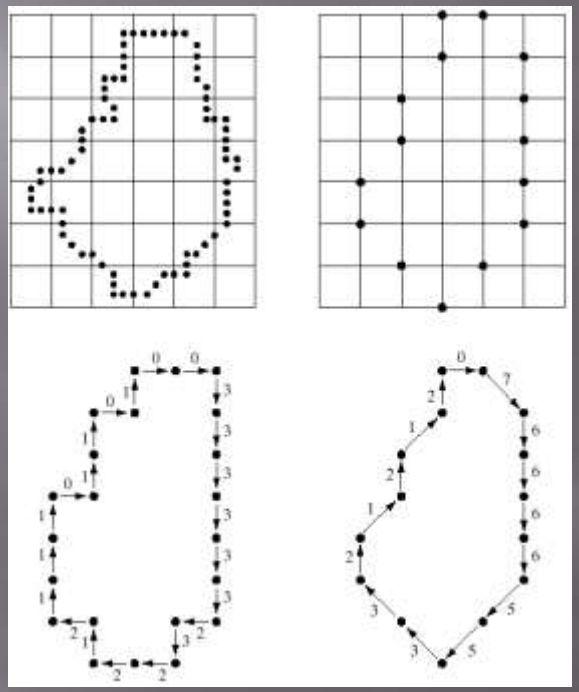

Colour Image Processing

Image Compression

REPRESENTATION & Description

- **Representation**: an object may be represented by its boundary.
- An object can be represented by: its external characteristics, such as its boundary or its internal characteristics, such as its texture.
- **Description**: the object boundary may be described by its length, orientation, or number of concavities
-

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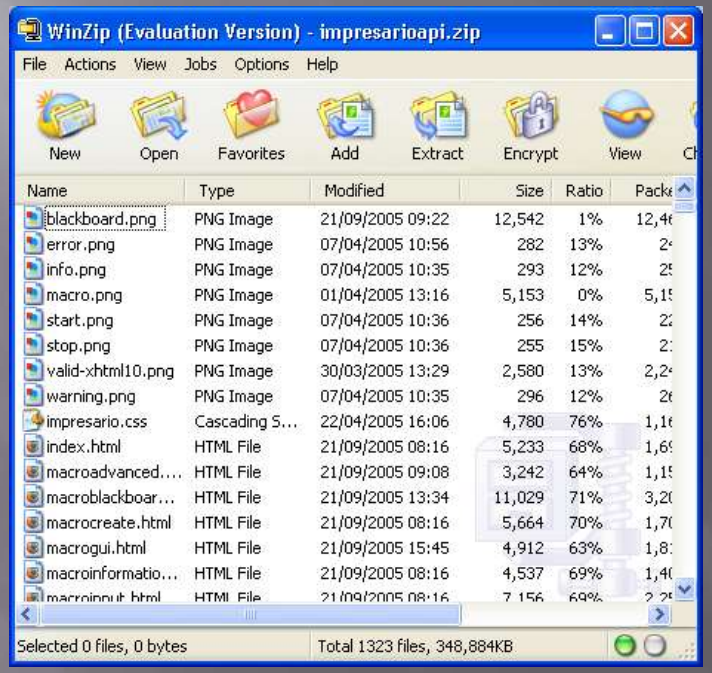

IMAGE COMPRESSION

- Compression is done for saving the disc space(represent image with minimum number of bits)
- 2 types of compression :
- 1. Lossy compression
- 2. Lossless compression
- **Lossy compression:**
- Here some of the information is lost

- **Lossless compression:**

  Reconstructed image will be same as the original image.

- 2 of the technique used in lossless compression:
  1. run –length coding
  2. Huffman coding

Image Restoration

Morphological Processing

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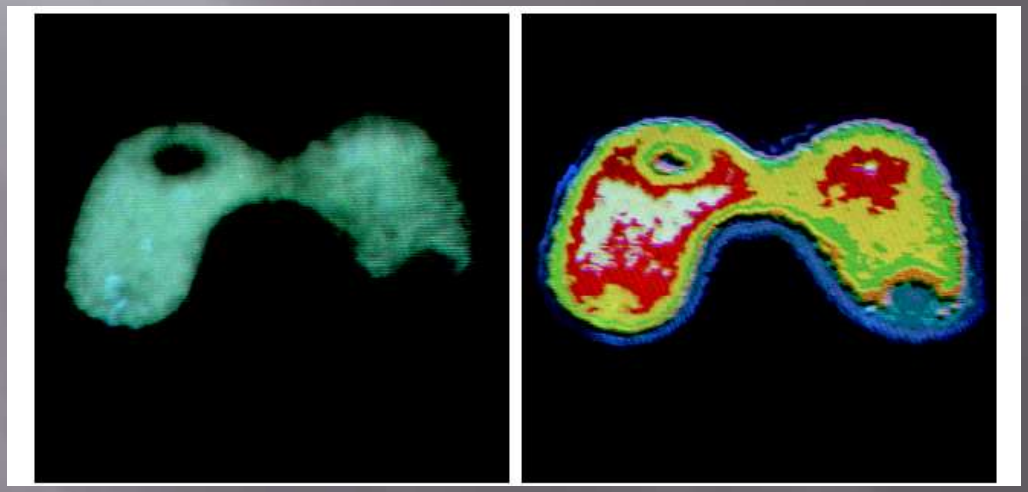

Segmentation

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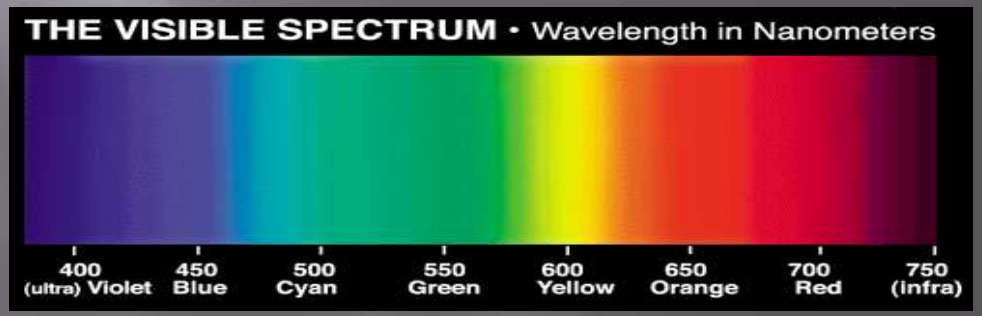
COLOR IMAGE PROCESSING

- Within 100 shades of grey- human eye can distinguish hundreds of thousands of different colours.



- Image- contains more information.
- Using this information we can simplify image analysis(eg. Object identification and extraction).

ADVANTAGES AND DISADVANTAGES

ADVANTAGES

- Post-processing the image
- images can be stored in the computer memory

DISADVANTAGES

- initial cost

FUTURE SCOPES

- Rescue
- Visuals for blind


ANY QUESTION?

THANK YOU ☺

http://www.inspiritionalthoughts.wordpress.com