

Image Segmentation

- is the process of dividing a digital image into multiple parts called segments which is set of pixels.

↓ → divide image into various parts.

The goal of Segmentation

- is to simplify the image into an image that more meaningful and easier to analyze.

Purpose of image Segmentation

- is to partition an image into meaningful regions with respect to particular application

Segmentation based on:

- measurements taken from image and might be grayscale, colour, texture, depth or motion.

Applications of image Segmentation include:

- Identifying objects in scene for object-based measurements.
- Identifying objects in moving scene // // // Video Compression.
- Identifying objects which are at different distances from sensor.

Image

- is collection or set of different pixels.
- we group together the pixels that have similar values using (IS)

object detection

- builds a bounding box corresponding to each object in the image, but it doesn't tell us about the shape of object

Image segmentation

- Create a pixel-wise mask for each object in the image. this technique gives us more information about the image.

Types of image segmentation

- Semantic segmentation.
- Instance segmentation.

Semantic example:

- - every pixel belongs to particular class.
- All pixels belonging to particular class are represented by same color.

Instance example:

- every pixel belongs to particular class.
- different objects of same class have different colors.

Classification of image segmentation techniques:

A) Structural segmentation techniques:

→ There are techniques of image segmentation that depend on the information of structure of required portion of image.

B) Stochastic Segmentation Techniques:

→ There are techniques of image segmentation that depend on discrete pixel values of the image instead of structural information of region.

C) Hybrid techniques:

→ There are techniques of image segmentation that use the concepts of both techniques.
- these use discrete pixel and structural information together.

Methods of image segmentation:

- Threshold method
- Edge based method
- Region based method
- Clustering based method
- Watershed based method.