Active Contours Model

What are Active Contours?

Active contour is a segmentation method that uses energy forces and constraints to separate the pixels of interest from a picture for further processing and analysis.

Active contour is defined as an active model for the segmentation process. Contours are the boundaries that define the region of interest in an image. A contour is a collection of points that have been interpolated. The interpolation procedure might be linear, splines, or polynomial, depending on how the curve in the image is described.

Why Active Contours is needed?

The primary use of active contours in image processing is to define smooth shapes in images and to construct closed contours for regions. It is mainly used to identify uneven shapes in images.

Active contours are used in a variety of medical image segmentation applications. Various forms of active contour models are employed in a variety of medical applications, particularly for the separation of desired regions from a variety of medical images. A slice of a brain CT scan, for example, is examined for segmentation using active contour models.

How does Active Contour work?

Active contours are the technique of obtaining deformable models or structures in an image with constraints and forces for segmentation. Contour models define the object borders or other picture features to generate a parametric curve or contour.

The curvature of the models is determined using several contour techniques that employ external and internal forces. The energy function is always related to the image's curve. External energy is described as the sum of forces caused by the picture that is specifically used to control the location of the contour onto the image, and internal energy, which is used to govern deformable changes.

The contour segmentation constraints for a certain image are determined by the needs. The desired shape is obtained by defining the energy function. A collection of points that locate a contour is used to describe contour deformation. This shape corresponds to the desired image contour, which was defined by minimizing the energy function.