

# Segmentation Methods

## Thresholding techniques

Global, adaptive, Otsu's method

## Region growing

Seed-based similar pixel grouping

## Watershed algorithm

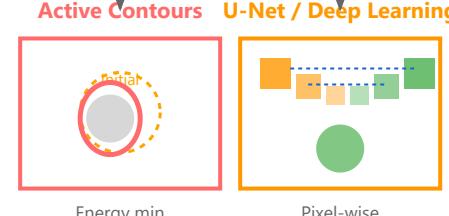
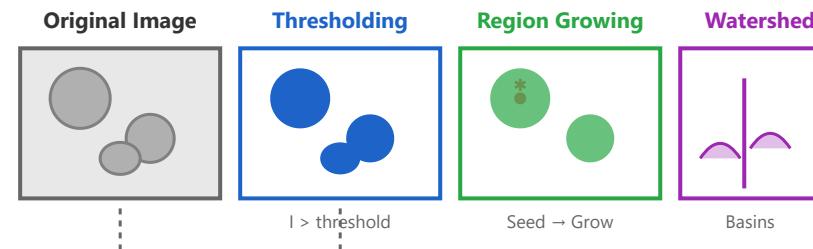
Treating image as topographic surface

## Active contours

Energy-minimizing snakes

## Machine learning methods

U-Net, Mask R-CNN for segmentation



**Clinical Applications**  
Tumor delineation • Cell counting  
Organ segmentation • Lesion detection

Method	Speed	Accuracy
Threshold	Fast	Medium
Region	Medium	Medium
Watershed	Medium	High
Snakes	Slow	High
Deep Learn	Slow	High

### Key Considerations:

- Threshold: Simple, fast, manual tuning
- Region: Good for homogeneous areas
- Watershed: Handles touching objects
- DL: Best accuracy, needs training data