Image Segmentation

- **Goals and Difficulties**

  - The goal of segmentation is to partition an image into regions (e.g., separate objects from background)

  - The results of segmentation are very important in determining the eventual success or failure of image analysis

  - Segmentation is very a very difficult problem in general !!

- **Increasing Accuracy and Robustness**

  - Introduce enough knowledge about the application domain

  - Control the environment (e.g., in industrial applications)

  - Select type of sensors to enhance the objects of interest

    (e.g, use infrared imaging for target recognition applications)

- **Segmentation approaches**

  <u>Edge-based approaches:</u>

    (i) Use the boundaries of regions to segment the image

    (ii) Detect abrupt changes in intensity (discontinuities)

  <u>Region-based approaches:</u>

    (i) Use similarity among pixels to find different regions

  - Theoretically, both approaches should give identical results but this is not true in practice