

# Assignment

- Decide on a dataset that provides pixel-level dense segmentation masks and download it or part of it.
  - Ideas: <https://paperswithcode.com/datasets?task=semantic-segmentation>
  - Ideally 1-10 GB, start small. Images should be at least 100x100 pixels, but potentially more
  - If dataset has more than 2 classes, start with considering only 2
  - You can also do a custom dataset (need probably ~200 images, depending on the object)
- Visualize some images and corresponding segmentation masks.
- Decide on a meaningful split between training/validation/testing data
  - Initially, you can “cheat” by setting validation==testing.
- Implement a segmentation-by-classification approach
  - Given an input patch cropped around pixel  $p$ , classify the pixel as class 1 or class 2
  - Start very simple (e.g. using the RGB values of the pixel itself as features + a logistic regressor). Then move up to more sophisticated approaches (e.g. a very simple CNN that takes a 15x15 patch centered on the pixel of interest)
  - Build training and testing datasets from training and testing images
  - Compute binary classification metrics (accuracy, AUC) on the testing dataset
  - Apply the model densely on a few testing images and visualize the resulting masks
- Build full-image segmentation models using Fully Convolutional Networks (upcoming)
- Evaluation criteria: NOT the absolute performance you obtain. Instead: the quality of the work, visualizations, presentation.

# Example of segmentation-by-classification

