Segmentation
Segmentation

- Semantic Segmentation: by class
- Instance Segmentation: by object
- Panoptic Segmentation: mixed
  - Instance segmentation of “things”
  - Semantic segmentation of “stuff”
Datasets

- MS COCO
- Driving Datasets
- Simulated Datasets
Applications

- Driving
- MS Kinect
- Graphics
FCN

- Upsampling
  - Linear
  - Upconvolutions
- Offset predictions
  - NaN testing
- Pre-trained classifiers

Improving FCN: Dilation

- Dilated convolutions
  - Pre-trained models still work
- Context module
  - Dilated layers on top of a complete network
  - Finer detail in segmentation


Improving FCN: Deformable Conv.

Train network to predict locations of the dilated kernel pixels

Mask R-CNN

Object Representation: Box

Simple
Easy to label
Compact

Occlusion
Too big
Not enough information
Object Representation: Mask

More detail
Better with occlusion and partial objects

Hard to label
Still not that much information
Object Representation: Keypoint

Low dimensional
Can have useful information
Class specific
Object Representation: 3D model

- Inverse graphics
- Lots of detail
- Too much detail
- Labeling is extremely hard
- (Sometimes) Surprisingly little information for all that detail