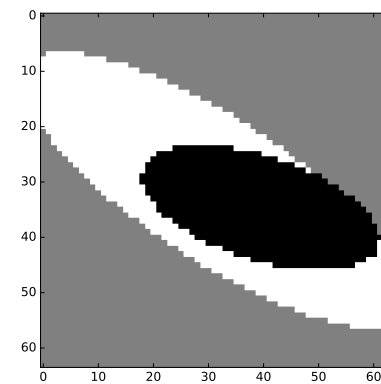
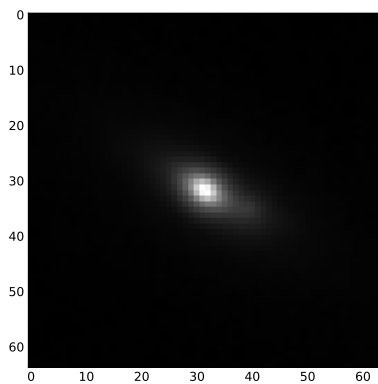
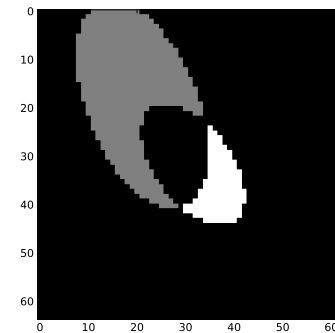
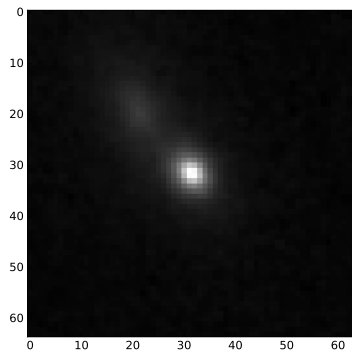
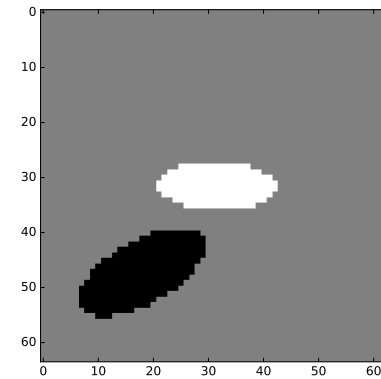
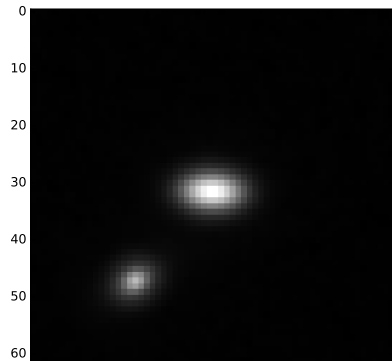
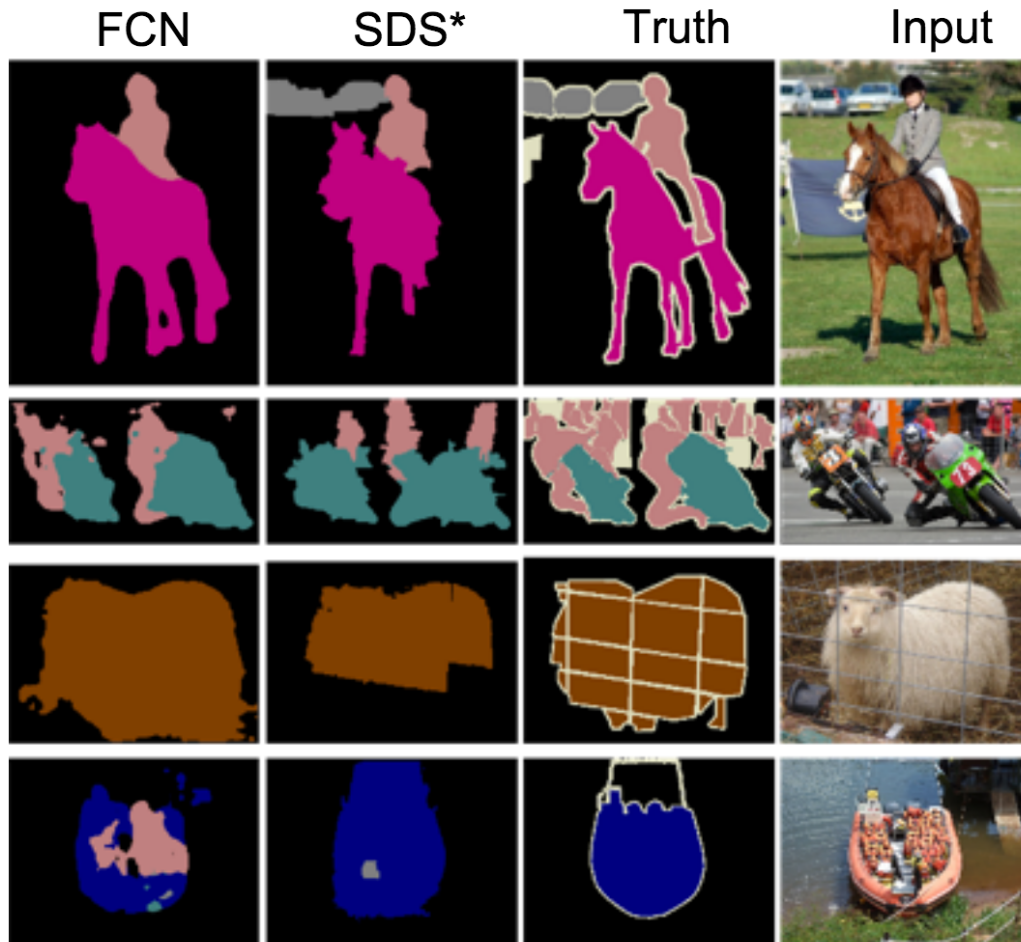


Detection / Deblending



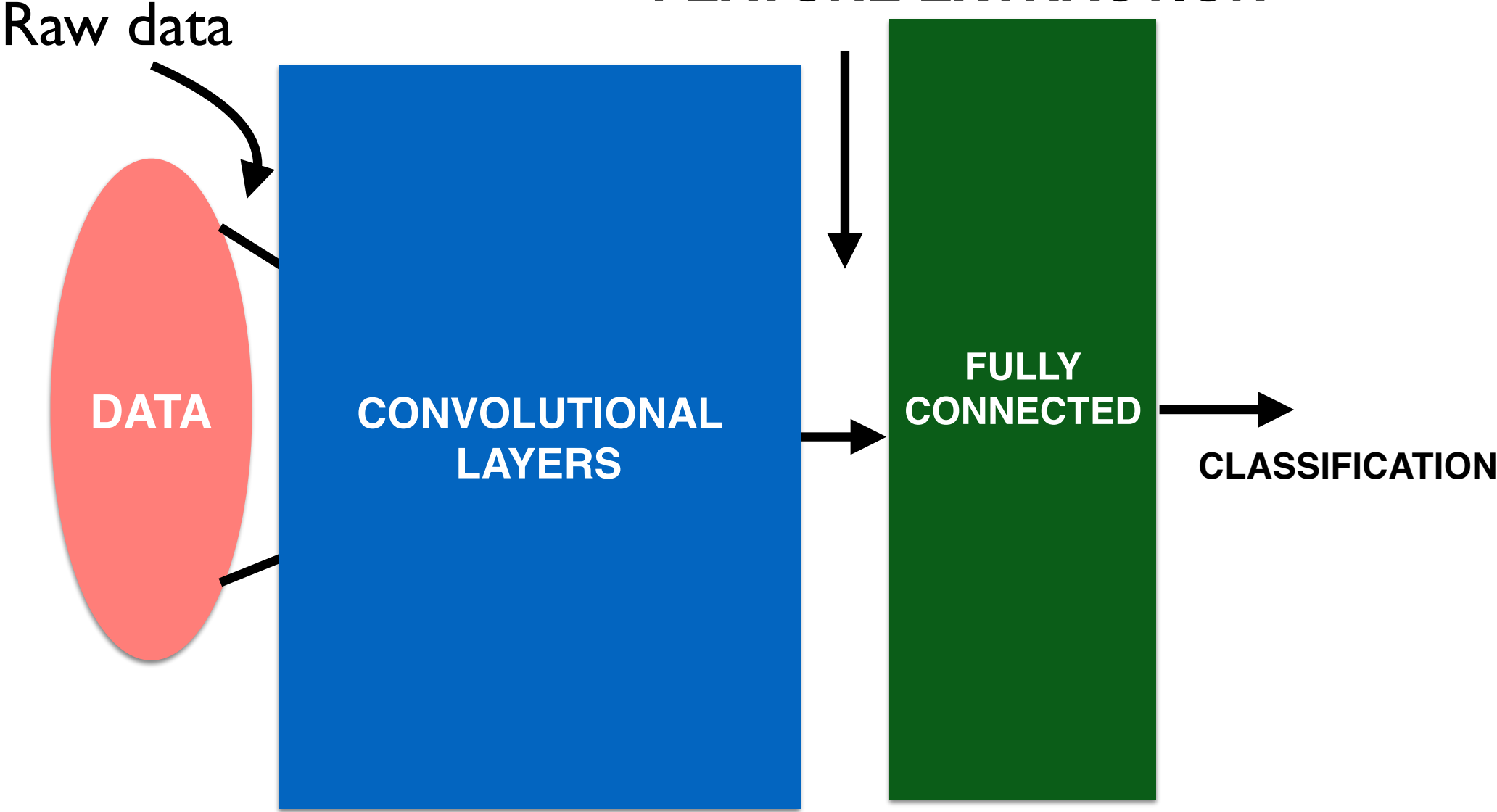
FCNs



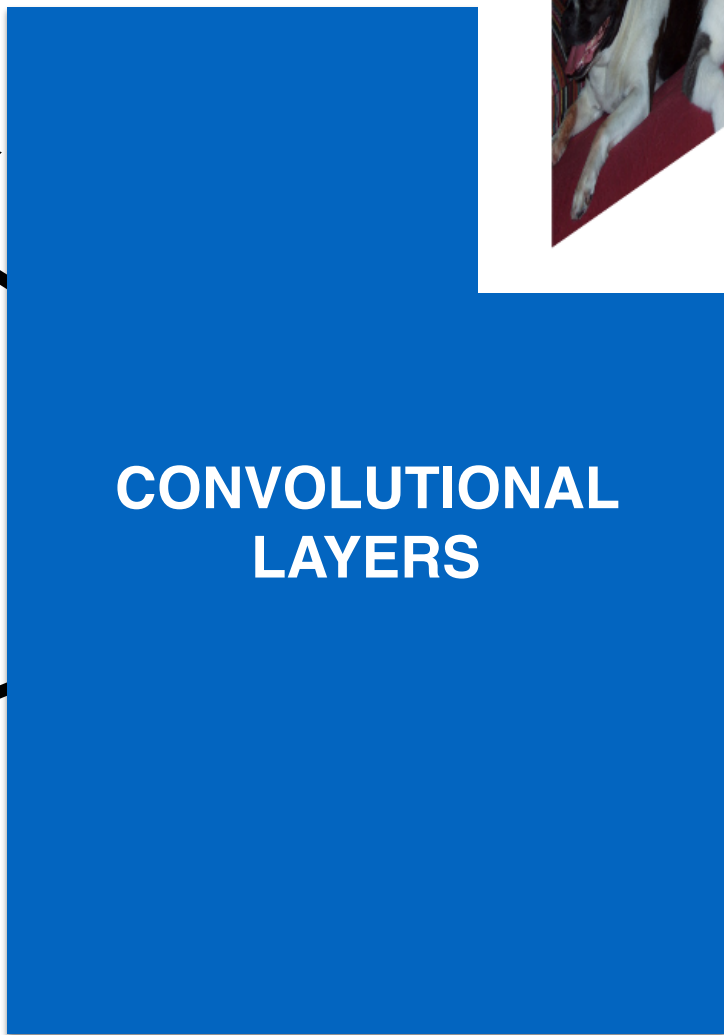
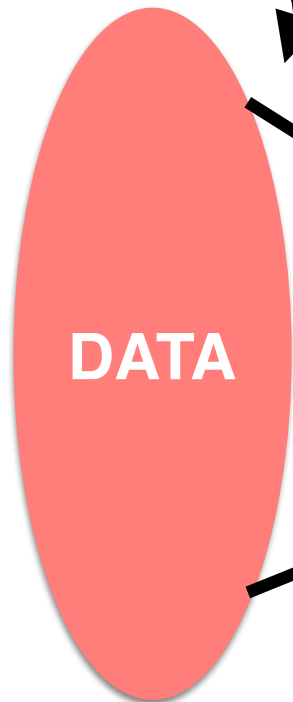
Fully convolutional neural networks are been proven to be a powerful tool for semantic segmentation

Credit: Jonathan Long

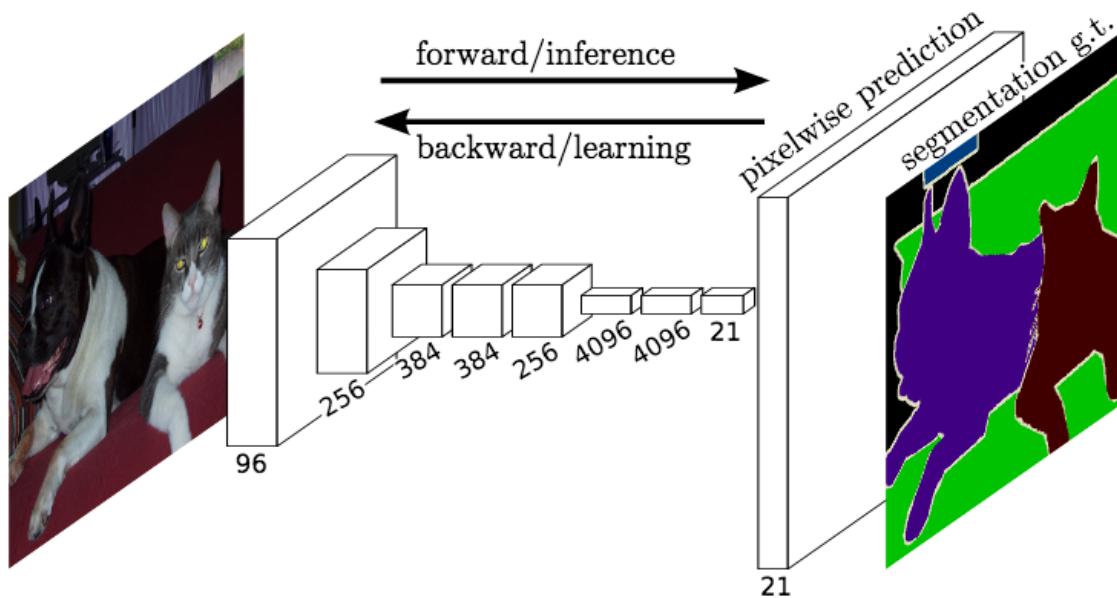
OPTIMAL UNSUPERVISED NON-LINEAR FEATURE EXTRACTION



Raw data



IMAGE



Simulations of galaxy pairs

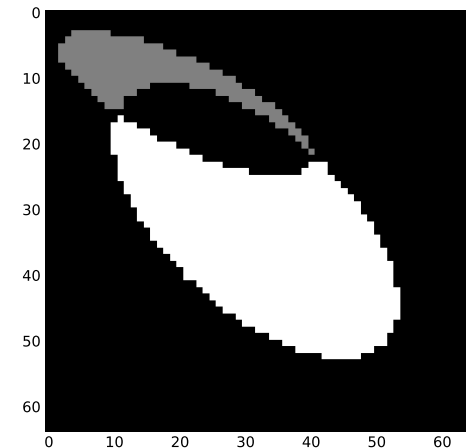
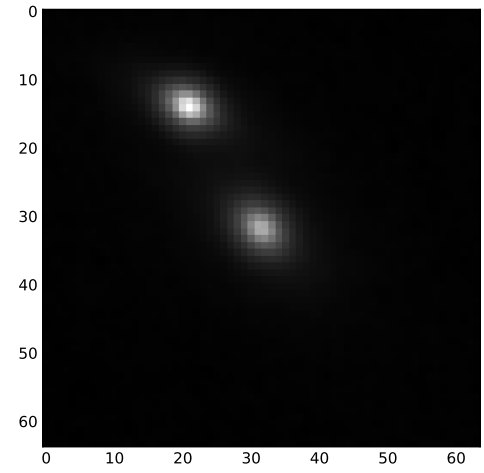
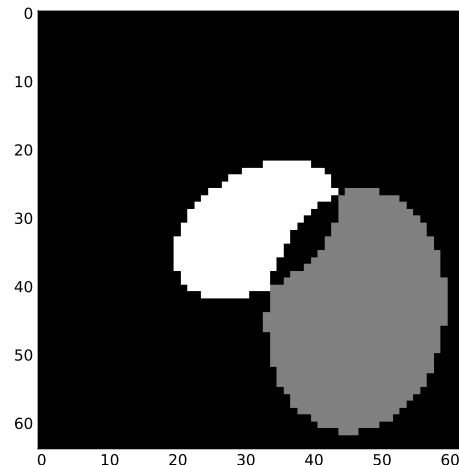
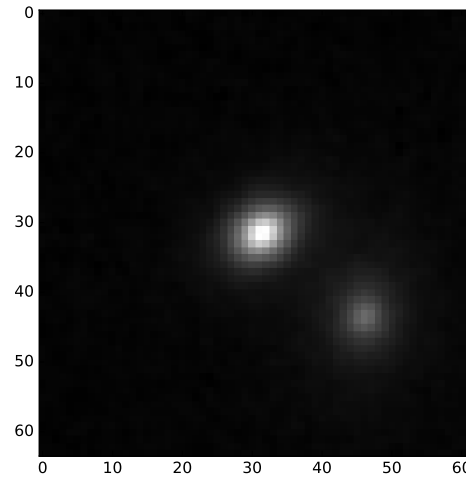
50.000 simulated images - Sersic profiles

Magnitude difference smaller than 2 mags

One galaxy in the center

The other **fully** randomly distributed in the image

CANDELS/HST noise

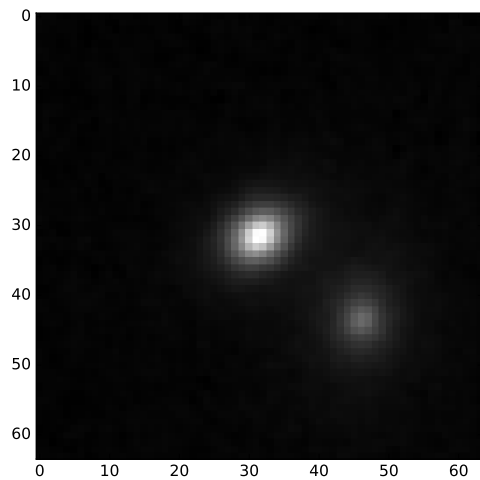


“True” segmentation map

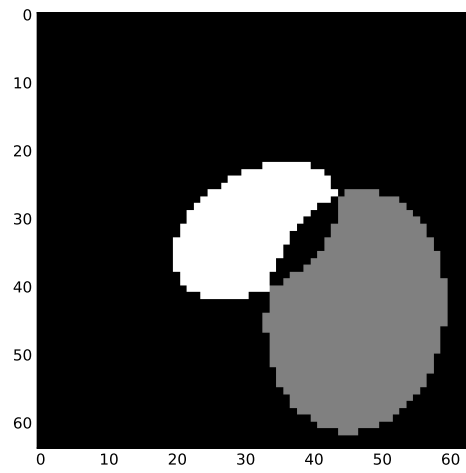
> 3 sigma

4 labels: obj1, obj2, inter, bg

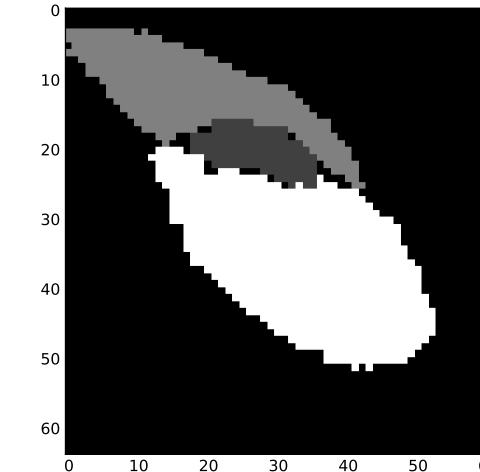
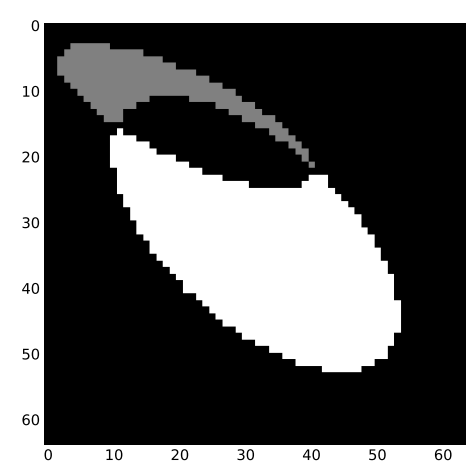
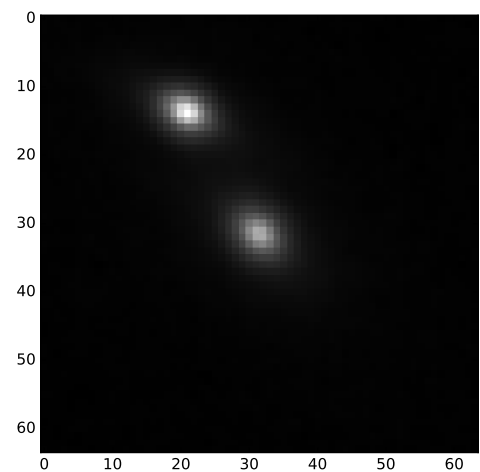
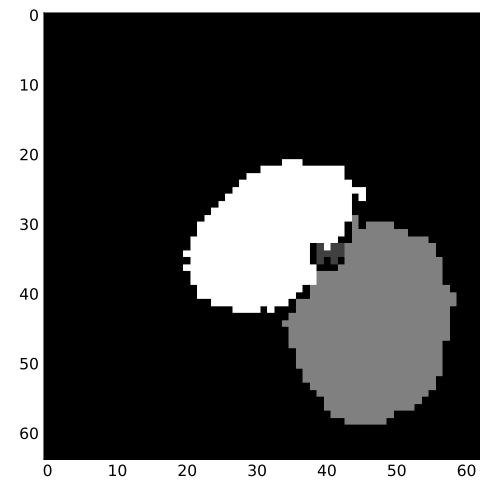
INPUT



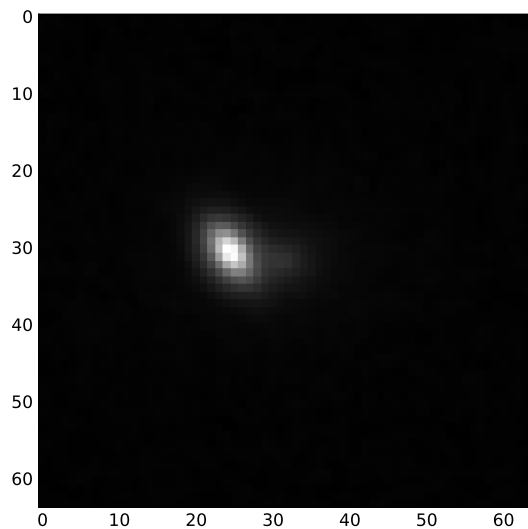
SEG MAP



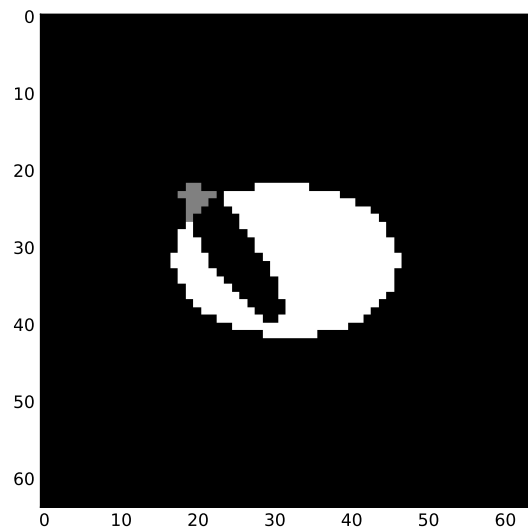
OUTPUT FCN



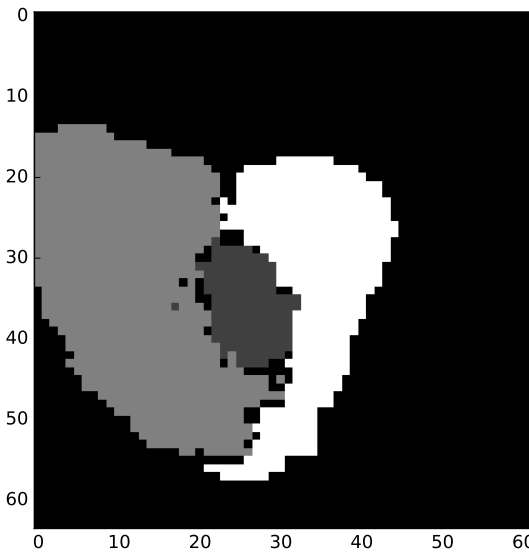
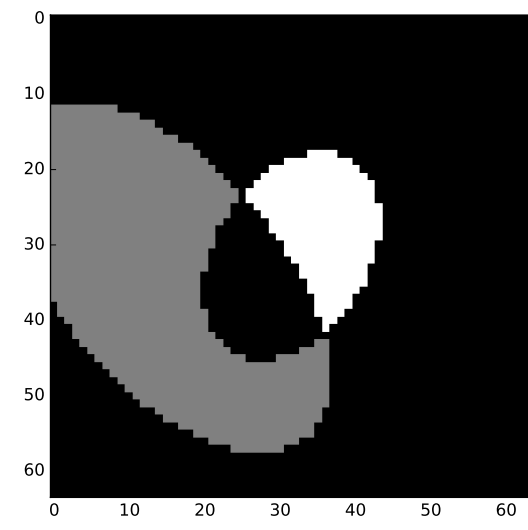
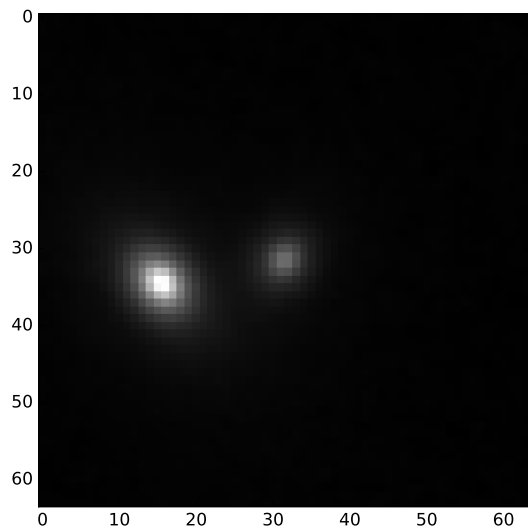
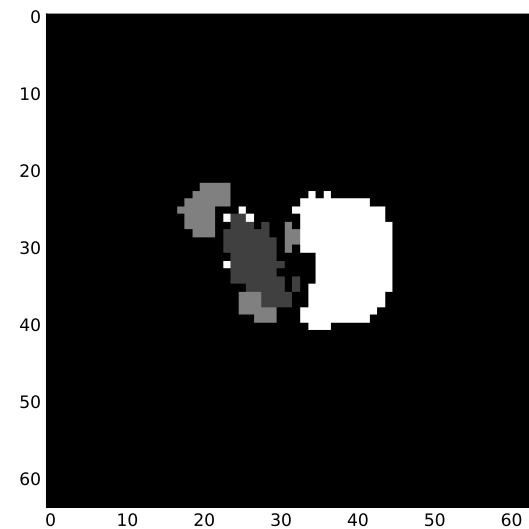
INPUT



SEG MAP



OUTPUT FCN



Still proof-of-concept

- Very idealized
- More complex sims needed, more than 2 objects
- irregular morphologies...
- Instance segmentation techniques to be tested
- Domain adaptation in CNNs is very powerful...