TensorFlow, Road Extraction Project

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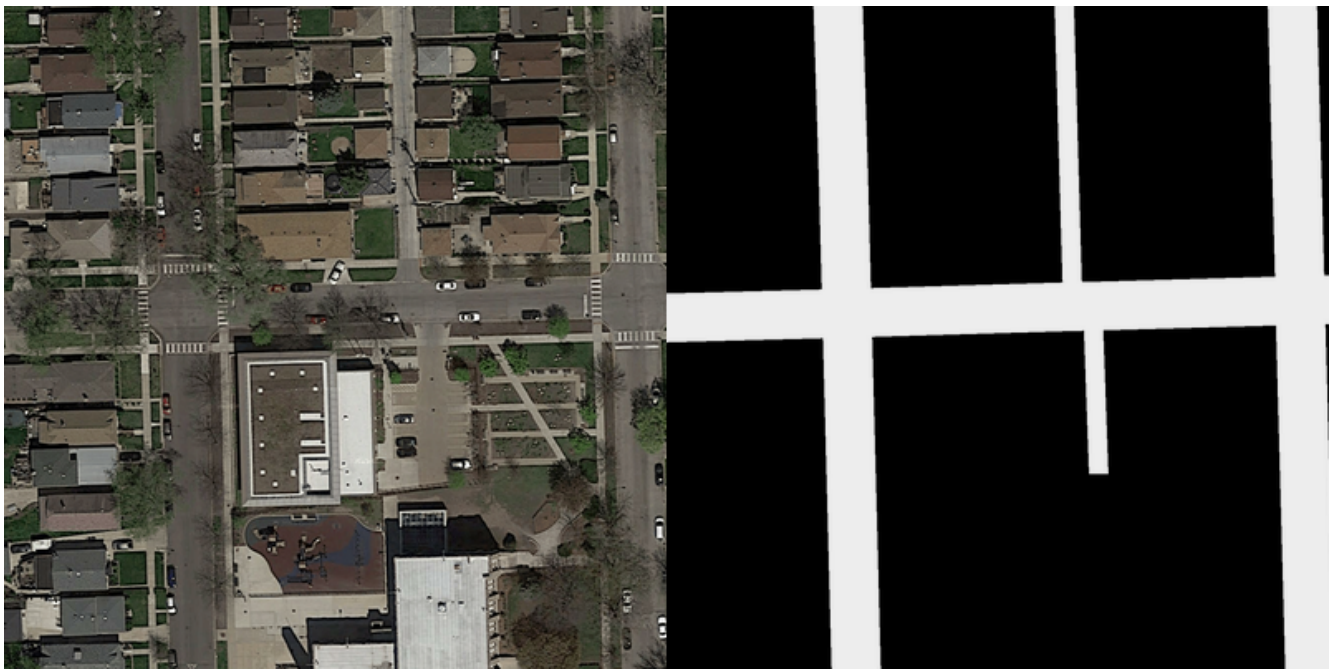
Image Segmentation

- We have 100 satellite images and we want to segment the road from the background
- The labels for each pixel are given by the ground truth images.
- Our aim is to develop a classifier which segments the road automatically



Feature Extraction and Logistic Regression

Let's see how to train a logistic regression classifier from the raw images. Here are the steps:

1. Define patch size and extract patches from the images and ground truth
2. Extract features consisting of average gray color and variance
3. Assign labels to the patches of the ground truth
4. Train a logistic regression classifier using scikit-learn

Convolutional Neural Networks(CNN)

- CNN does not require hand-crafted features
- ReLU activation functions are used
- L2 regularization is used on fully connected layers
- The weights are learned by (Batch) Stochastic Gradient Descent with decaying learning rate
- The architecture is
  INPUT - CONV - RELU - POOL - CONV - RELU - POOL - FC1 - RELU - FC2