
University of Colorado
Boulder

Deep Learning Applications for Computer Vision

Lecture 14: Neural Network Tutorial with TensorFlow

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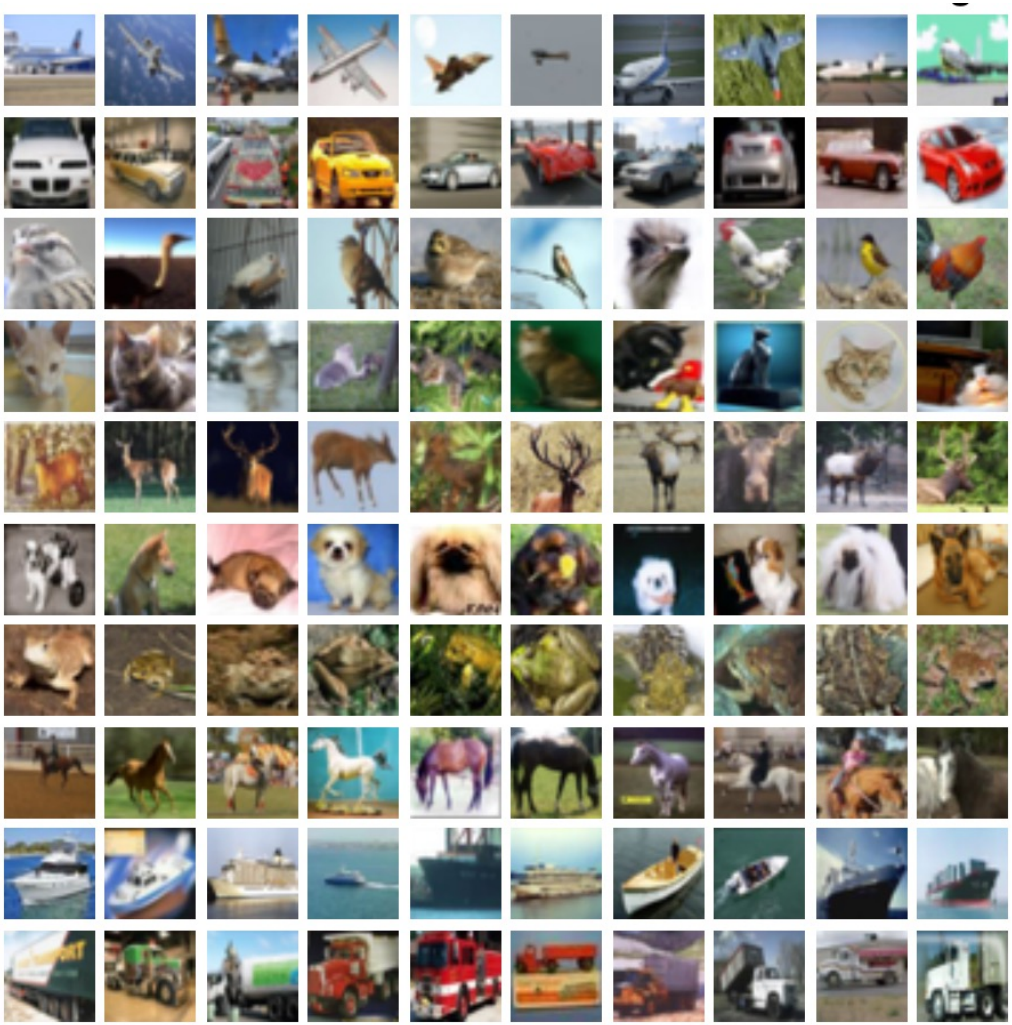
Image Classification Pipeline

Last time: CIFAR-10 data



Our model:

- Input layer
- Output layer

Today: let's implement the model in *TensorFlow*

- *build*
- *train*
- *assess*
- *predict*

TensorFlow tutorial

File name:

- Build_train_NN_CIFAR10.ipynb

What have we learned?

1. Import *TensorFlow* and helper libraries
2. Load the data set.
3. Pre-process data. Verify data shape and display
4. Build the network model
   - Sequential
   - Stack layers, one at a time
5. Choose Optimizer and loss function
6. Compile and train. Observe loss and accuracy over time
7. Run on *Testing Data*. Observe accuracy
8. Predict on new images

System performance

- Time to train: on the order of seconds
- Overall accuracy:
  - 40% on training data
  - 33.89% on testing data
- Best/worst class accuracy

Visualizing the filters