CNNS

TRANSFER LEARNING

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`WiFi : SG-Guest`

Problems with Installation? **ASK!**

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PLAN OF ACTION

TODAY

- Start with mini-challenge wrap-up
- CNN transfer learning x 2
- CNN image search
- ... Get projects into Topics

PLAN OF ACTION

WEDNESDAY

- CNN model transfer
- Launch into a CNN project
- ... Get projects into Topics

CNNS PT II

- Use a pretrained model
- Solve a problem it wasn't trained on
- i.e. Deep Learning as a component

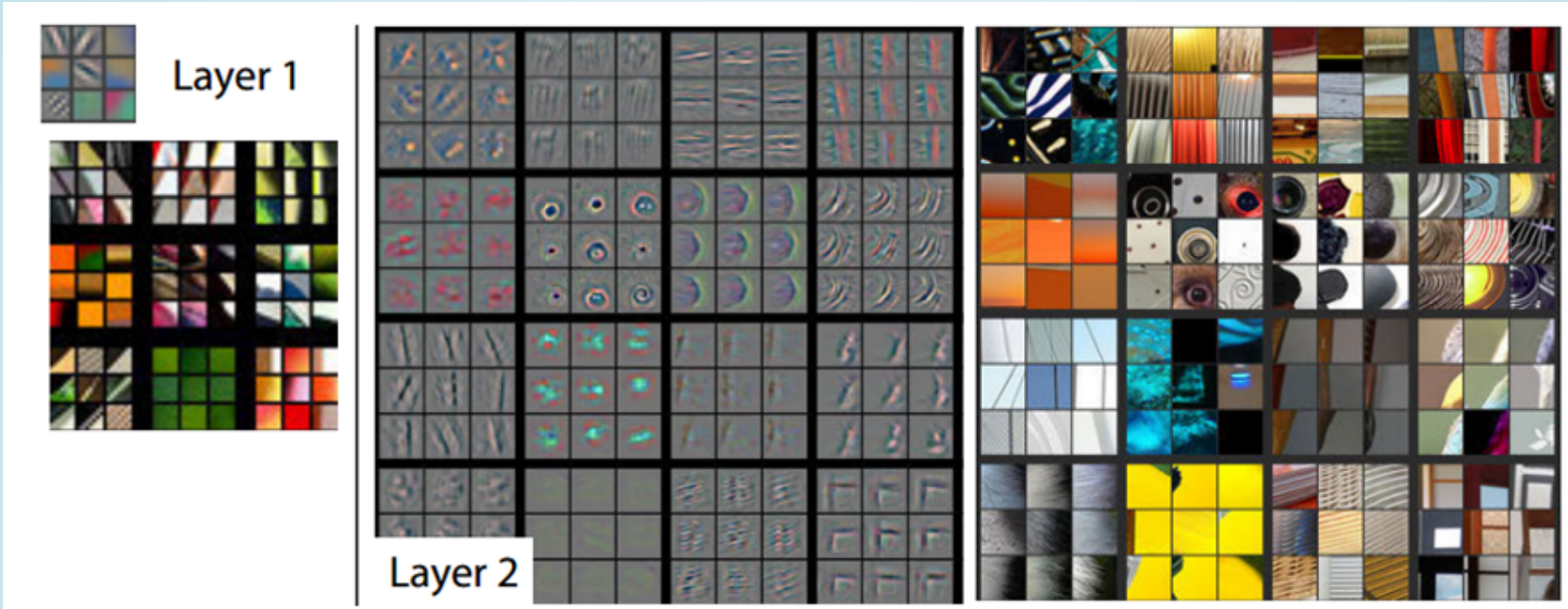
GOALS

- Distinguish between Classic and Modern sports cars
  - Could be other types of images
  - Could be many different classes
- Very small training time
- Very small number of training examples
- Able to be put into production

CNN REPRESENTATIONS

- Each successive layer ...
  - ... seems to learn 'higher level' representations
- All created by BackProp (no hand-crafted features)
- Surprisingly like the *actual brain*

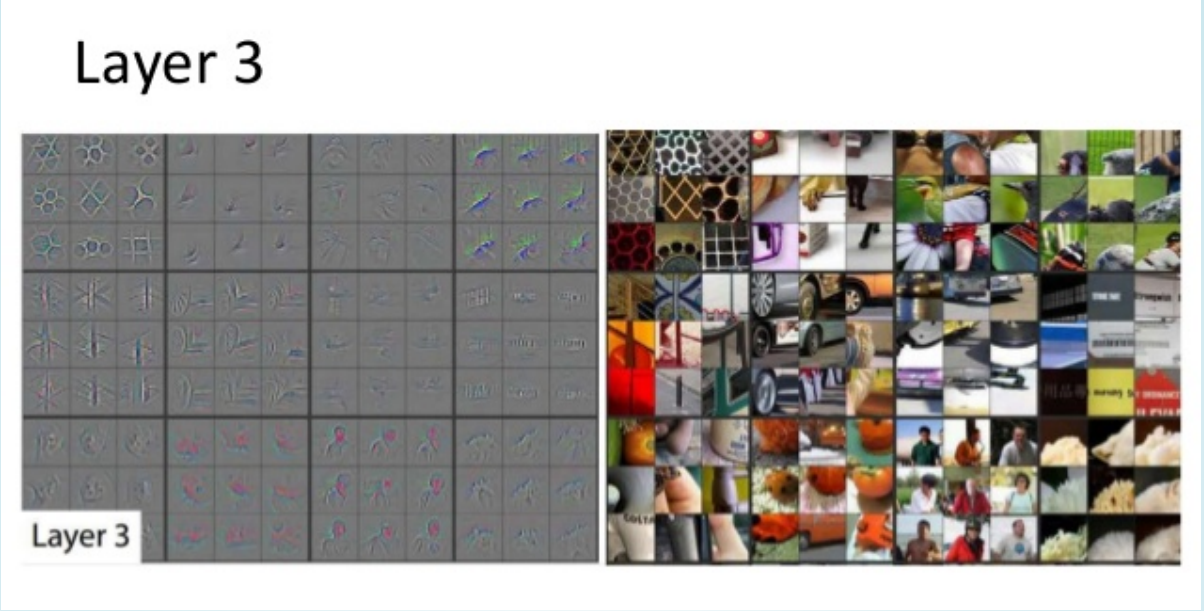
EARLY LEVELS



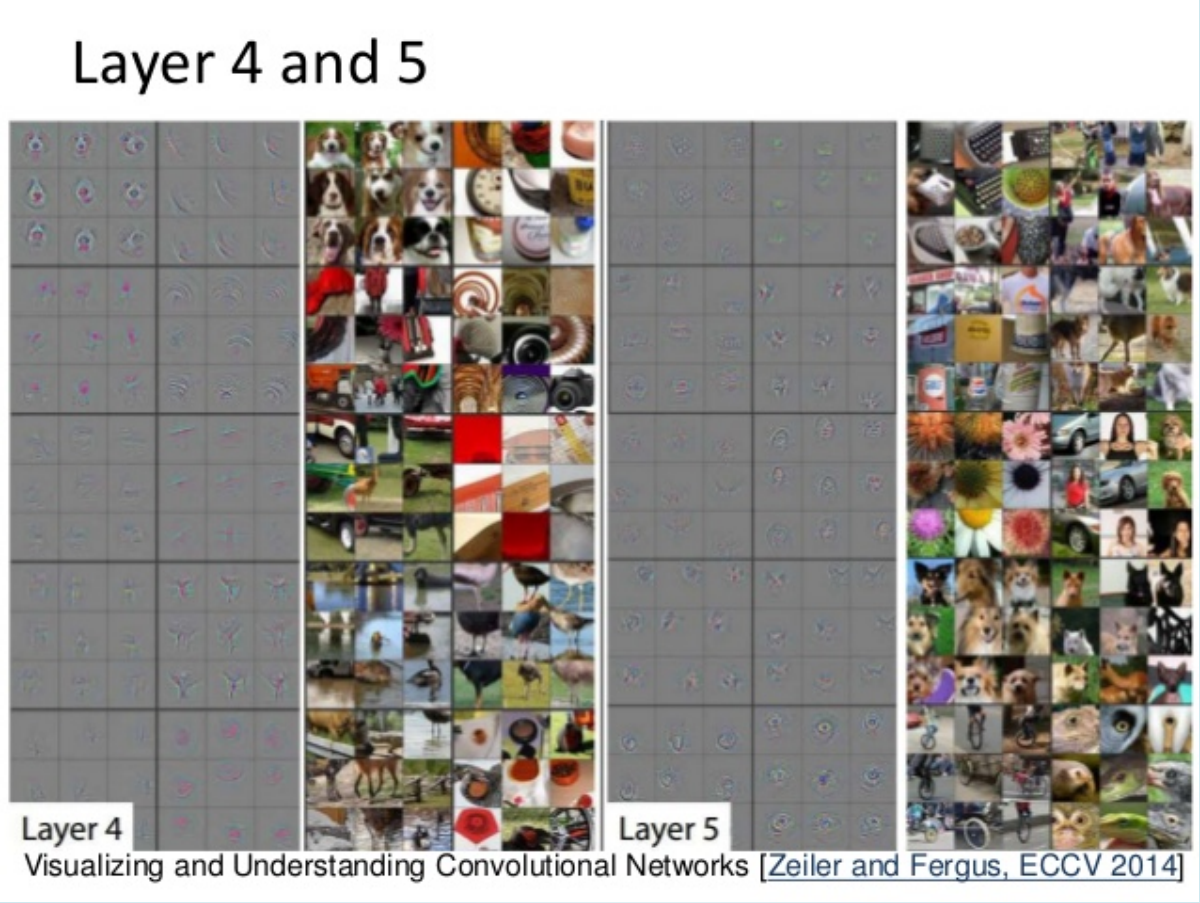
Visualizations of Layer 1 and 2. Each layer illustrates 2 pictures, one which shows the filters themselves and one that shows what part of the image are most strongly activated by the given filter. For example, in the space labled Layer 2, we have representations of the 16 different filters (on the left)

Visualizing and Understanding Convolutional Networks (2013) (large download)

MIDDLE LEVEL

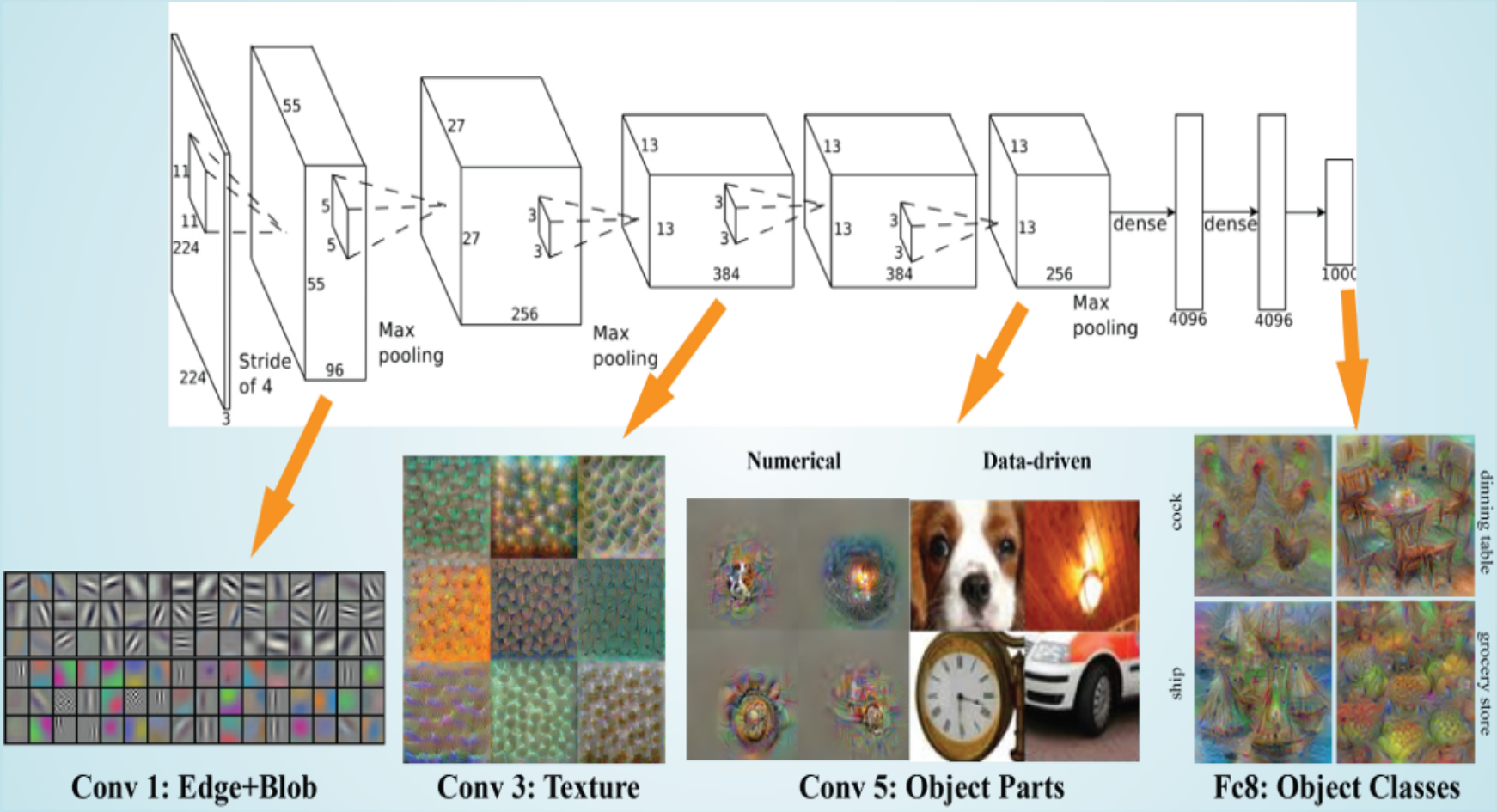


LATER LEVELS



Visualizing and Understanding Convolutional Networks [Zeiler and Fergus, ECCV 2014]

ALEXNET



ImageNet Classification with Deep Convolutional Neural Networks (2012) (Alex Krizhevsky)

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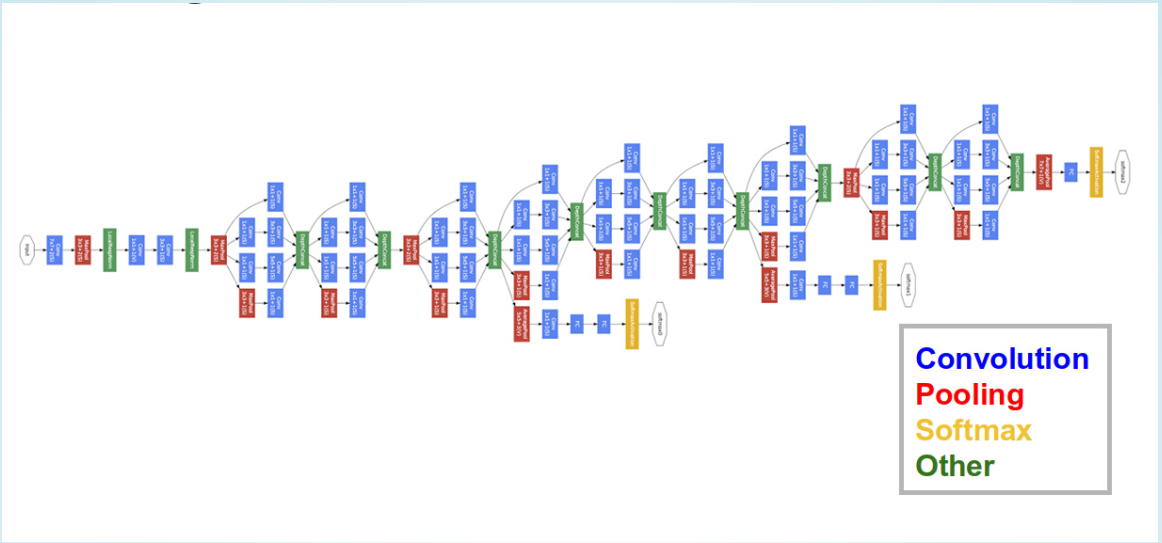
2014 : STATE-OF-THE-ART

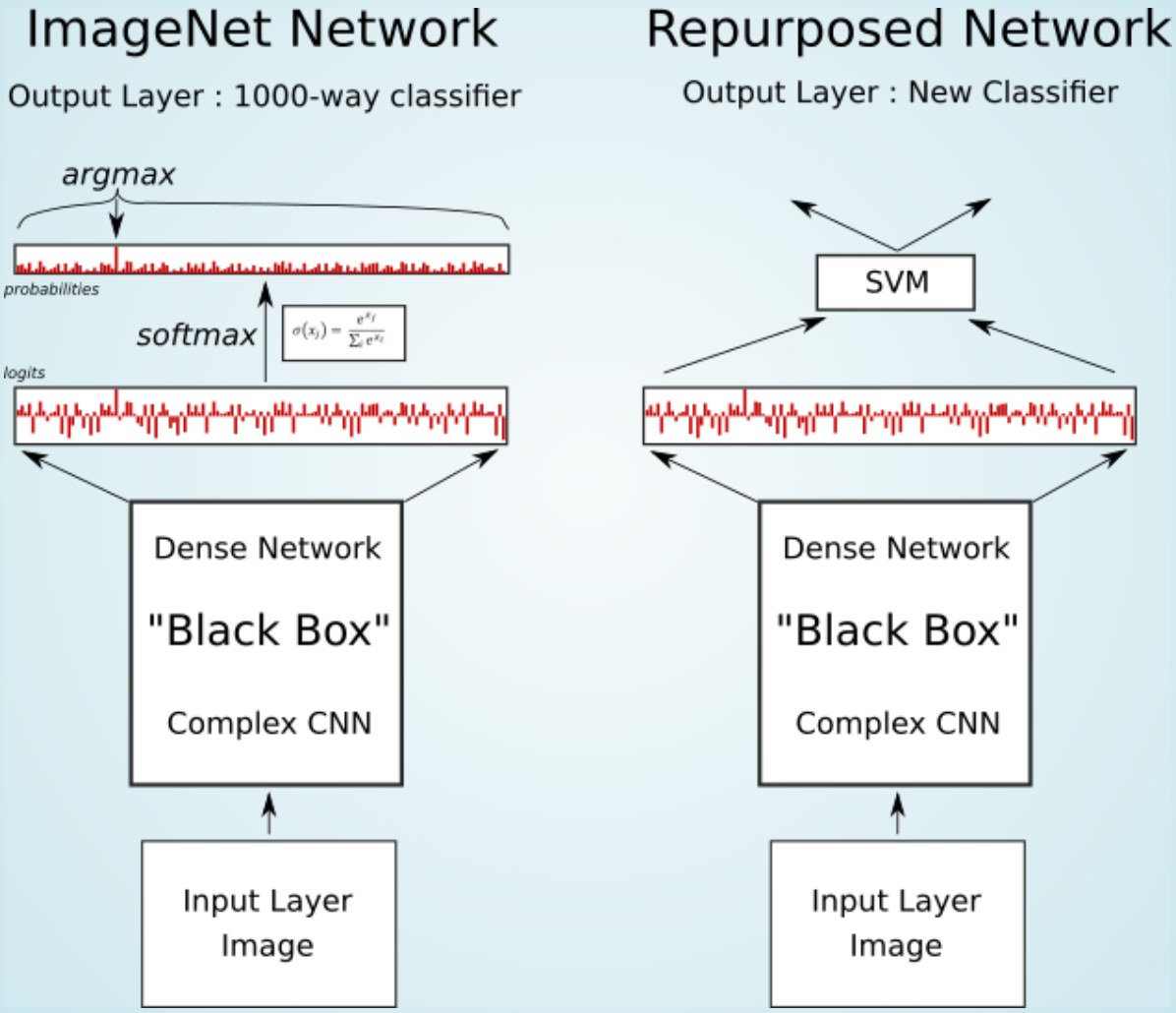


GoogLeNet - aka Inception v1

APPROACH

- Take an existing model trained for ImageNet
- Instead of softmax layer :
  - use the **logits layer** as features to train an SVM
- Support Vector Machines are 'well understood' tools

NETWORK PICTURE



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THE CODE

- Transfer Learning in TensorFlow (TF-slim)
- github.com/mdda/deep-learning-workshop/notebooks/2-CNN/5-TransferLearning/4-ImageClassifier-inception_tf.ipynb

- QUESTIONS -

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