Unit 4 —
Machine
Vision

ConvNets

LeNet-5

AlexNet

Transfer
Learning

Project
Formulation

Up Next

Machine Vision
Deep Learning — Unit 4

Dr. Jon Krohn
jon@untapt.com

Slides available at jonkrohn.com/talks

March 10th, 2017

NYC DATA SCIENCE
ACADEMY

Outline

1 **Intro to Convolutional Neural Networks**

2 Classic ConvNet Architecture I: LeNet-5

3 Classic ConvNet Architecture II: AlexNet

4 Transfer Learning

5 Deep Learning Project II: Formulating

6 Next Session: November 18th

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CONVOLUTIONS

DeepVis
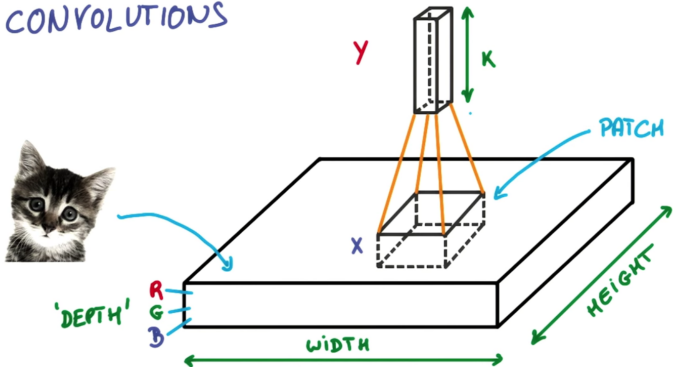
[deepvis]

Convolution Demo

from the illustrious [Andrej Karpathy]
(*everyone* gets a turn on whiteboard)

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LeNet-5

let's make our [deep net] *convolutional*!

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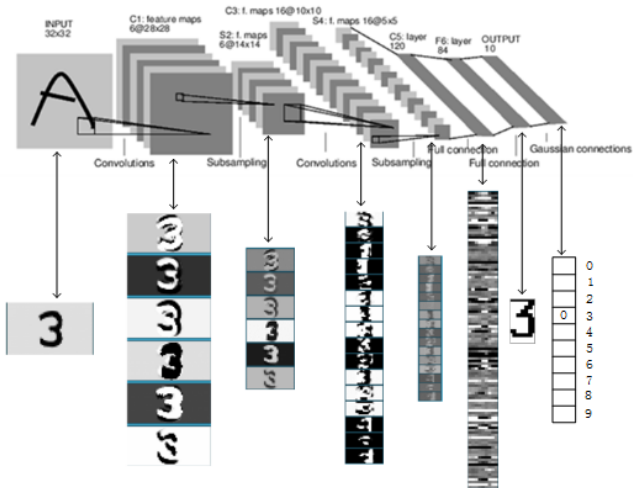5 Deep Learning Project II: Formulating

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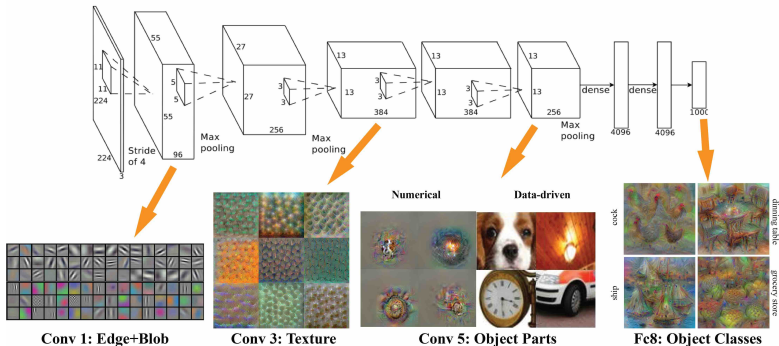
AlexNet

[AlexNet] from scratch

VGGNet (Simonyan & Zisserman, 2014)
Take-Home Exercise III

- build VGGNet from AlexNet notebook
- be able to verbalize all Arsenal (Theory I-IV) items

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- [toy example]
- [pre-trained model weights in Keras]
- [beefy bottleneck features example]

- [toy example]
- [pre-trained model weights in Keras]
- [beefy bottleneck features example]

- [toy example]
- [pre-trained model weights in Keras]
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Formulating
Your Deep Learning Project II

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- training set (80% — for optimizing parameters)
- validation set (10% — for hyperparameters)
- test set (10% — don't touch yet!)

2 build architecture
- if machine vision (incl. transfer learning), *now*
- if NLP, wait until next session

3 get above chance (simplifying problem, if necessary)

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Natural Language Processing