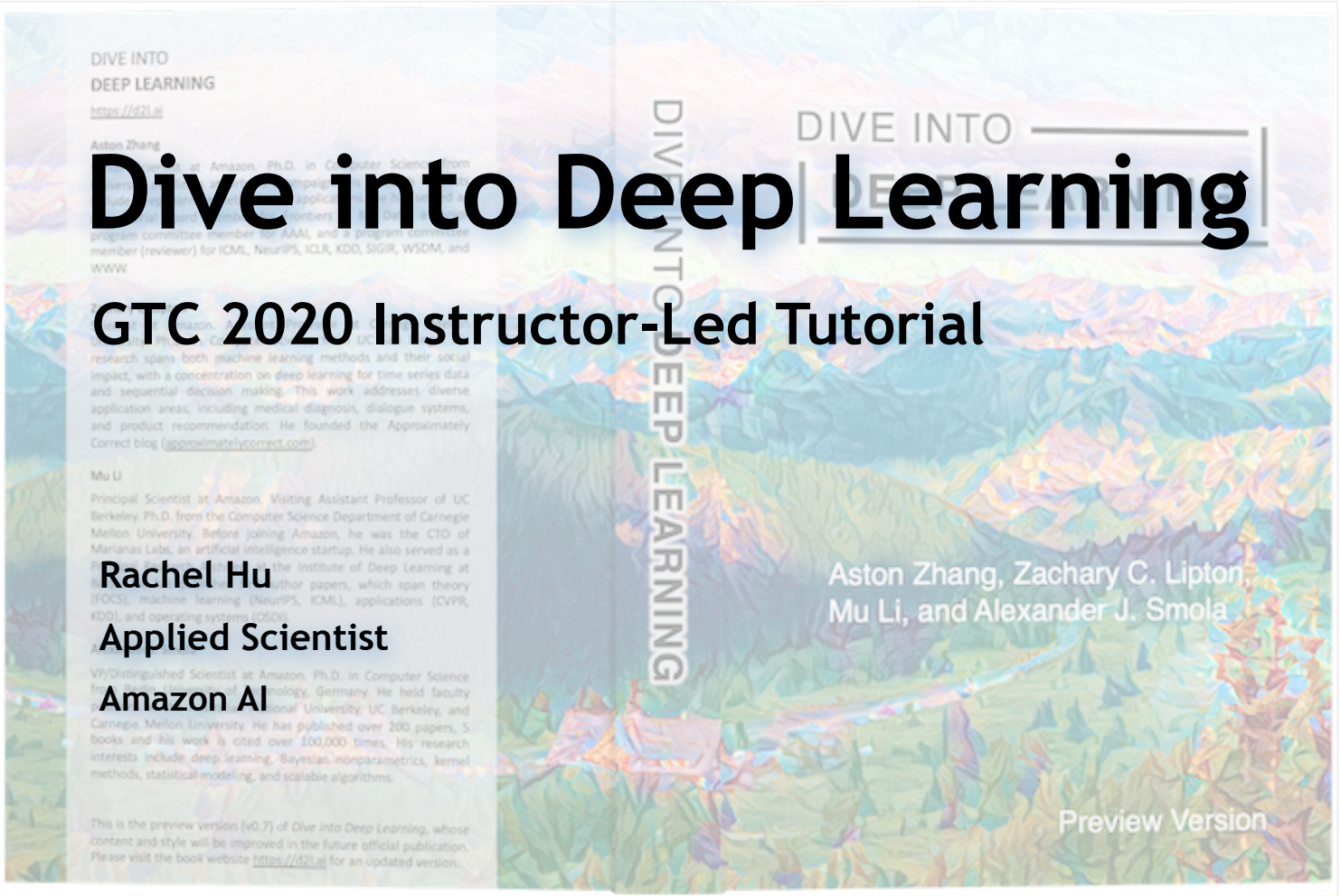


Dive into Deep Learning

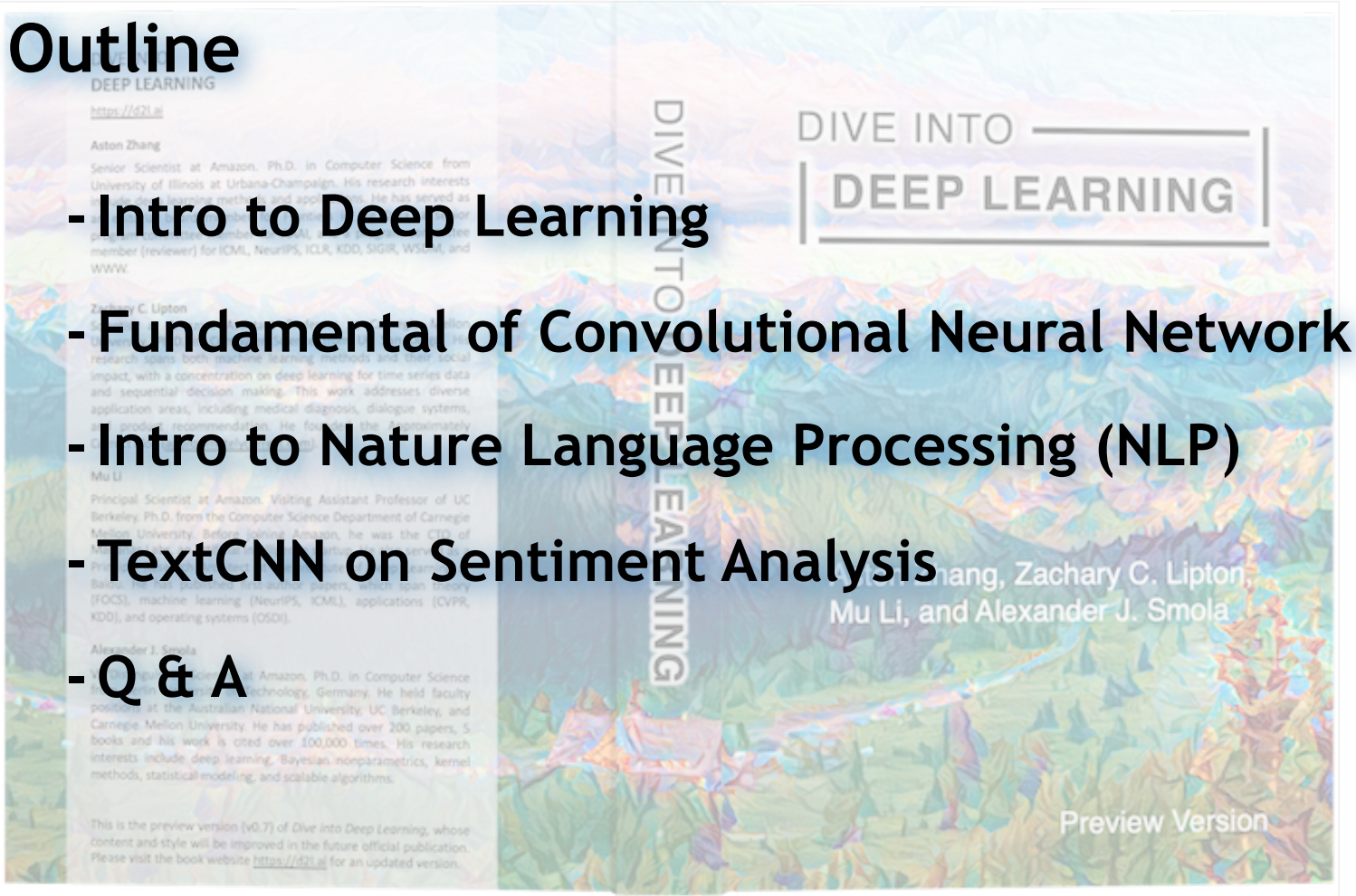
GTC 2020 Instructor-Led Tutorial

Rachel Hu

Applied Scientist

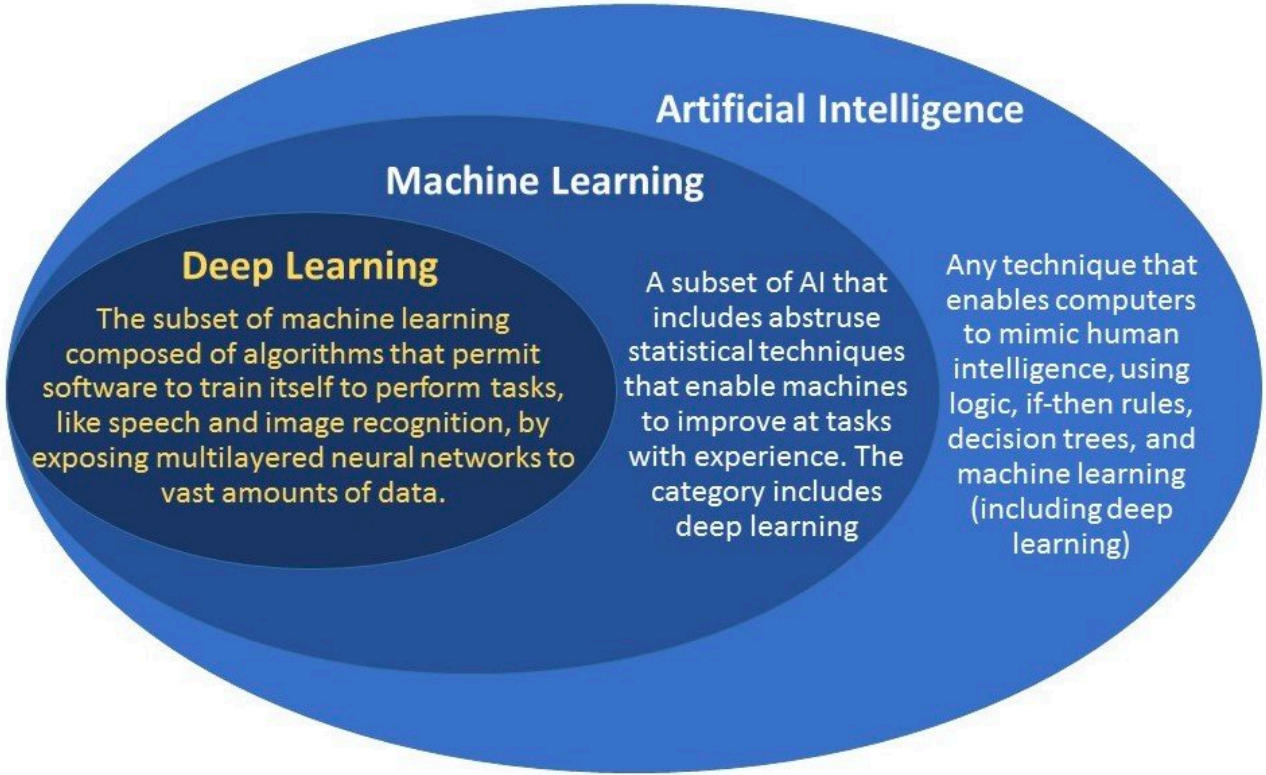
Amazon AI

Outline



- Intro to Deep Learning
- Fundamental of Convolutional Neural Network
- Intro to Nature Language Processing (NLP)
- TextCNN on Sentiment Analysis
- Q & A

Deep Learning in Context



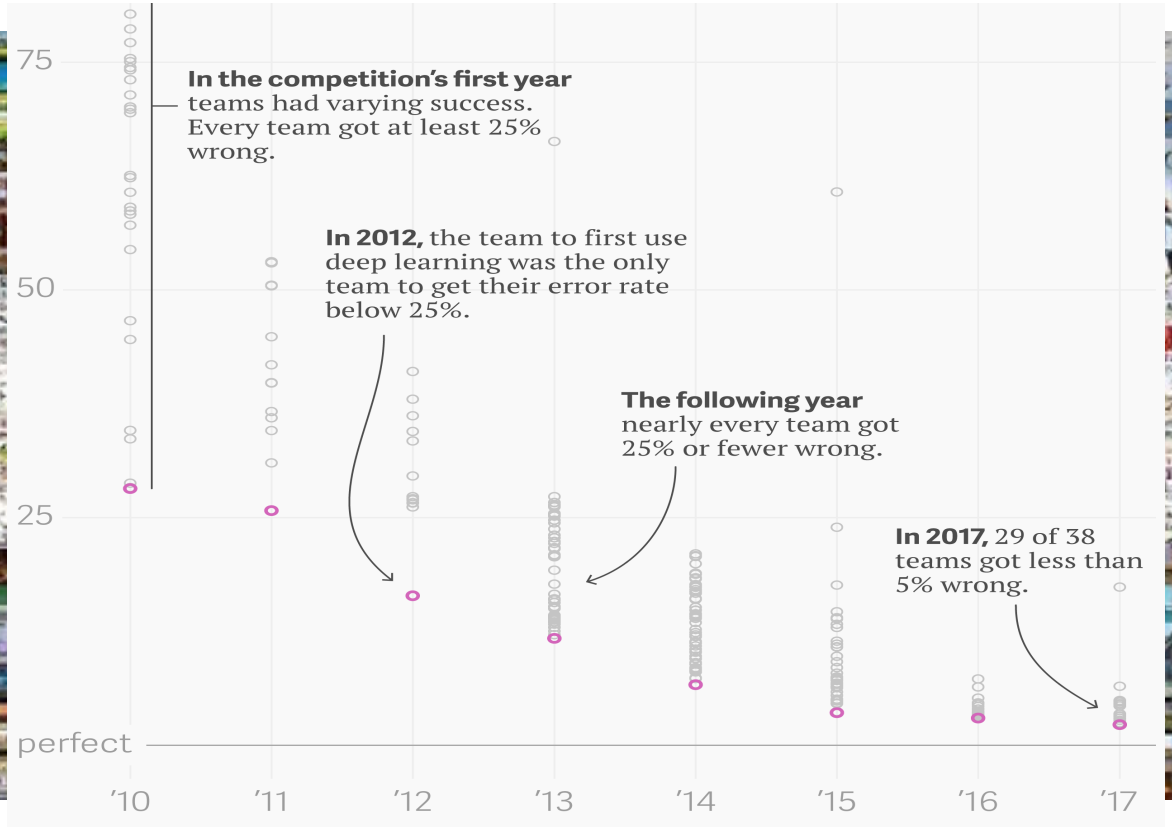
https://www.geospatialworld.net/blogs/difference-between-ai%EF%BB%BF-machine-learning-and-deep-learning/

aws

Why Deep Learning?

http://www.image-net.org/

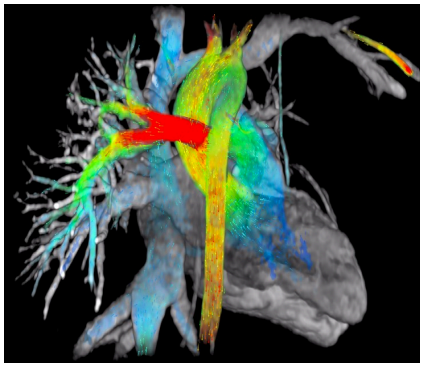
Why Deep Learning?



Yanofsky, Quartz
https://qz.com/1034972/the-data-that-changed-the-direction-of-ai-research-and-possibly-the-world/

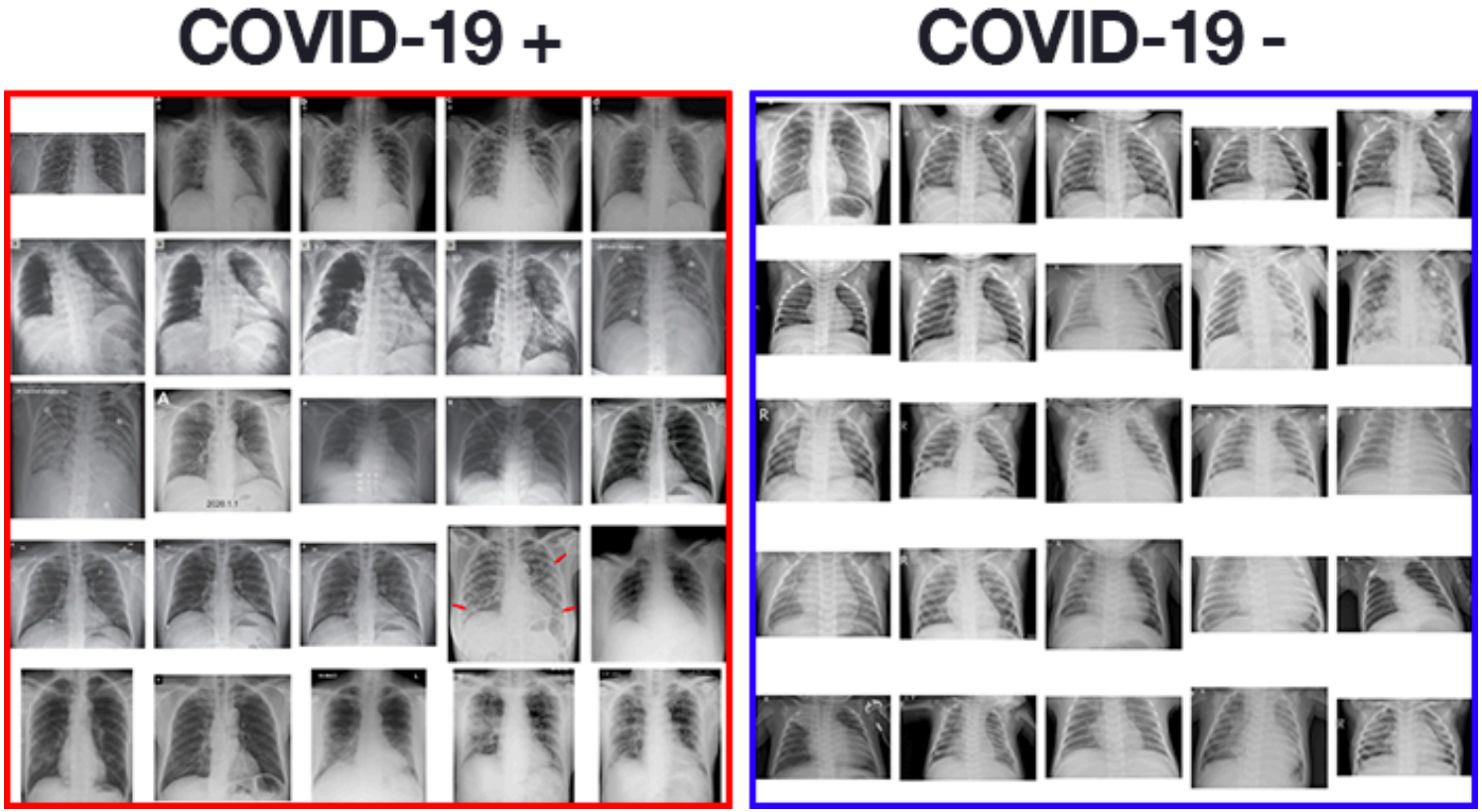
aws

Deep Learning Application Domains



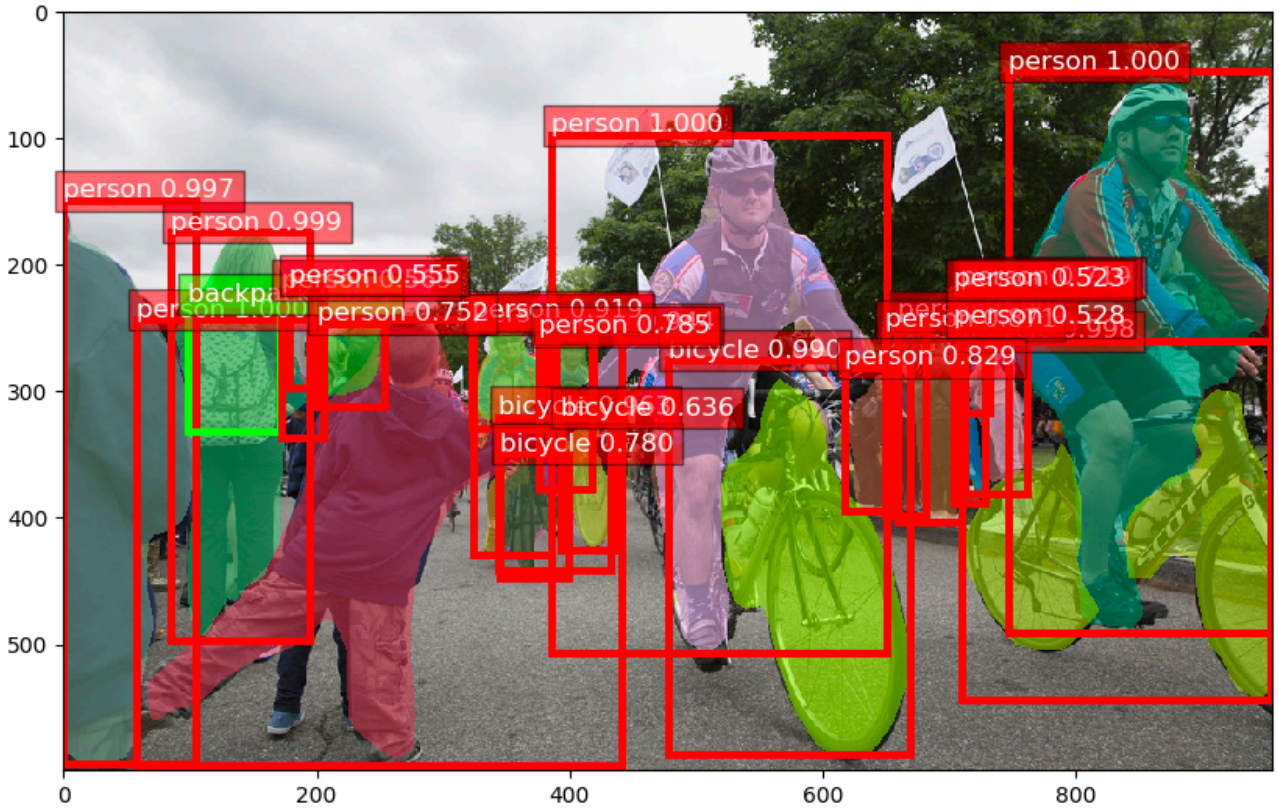
- Text Documents
- Images/Videos
- Bio/Medial Data
- Satellites Data

Image Classification



https://www.pyimagesearch.com/2020/03/16/detecting-covid-19-in-x-ray-images-with-keras-tensorflow-and-deep-learning/

Detect and Segment Objects



https://gluon-cv.mxnet.io/build/examples_instance/demo_mask_rcnn.html

aws

Style Transfer

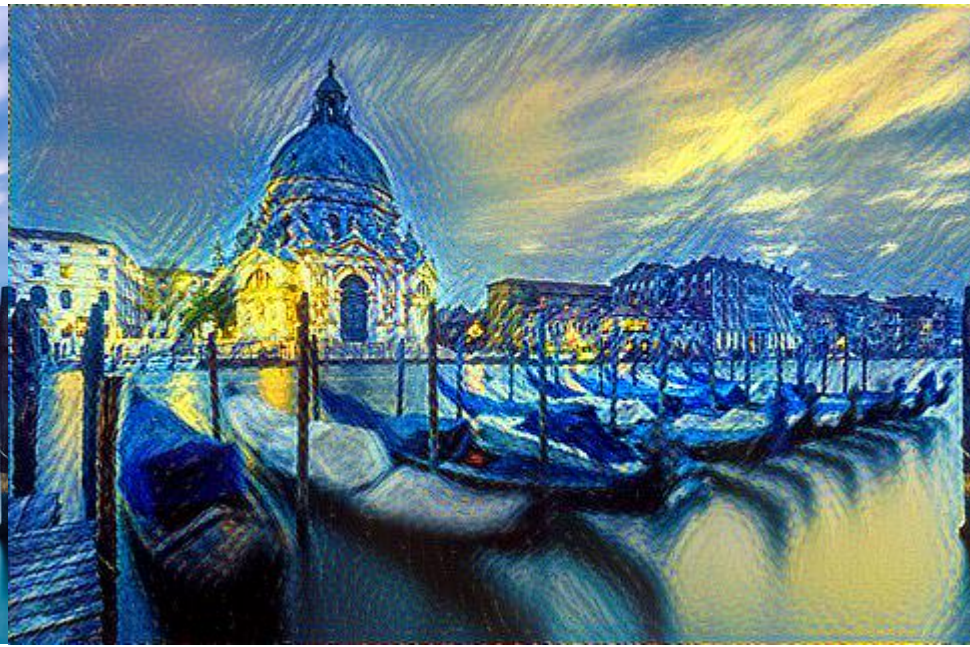
https://github.com/zhanghang1989/MXNet-Gluon-Style-Transfer/

Style Transfer

https://github.com/zhanghang1989/MXNet-Gluon-Style-Transfer/

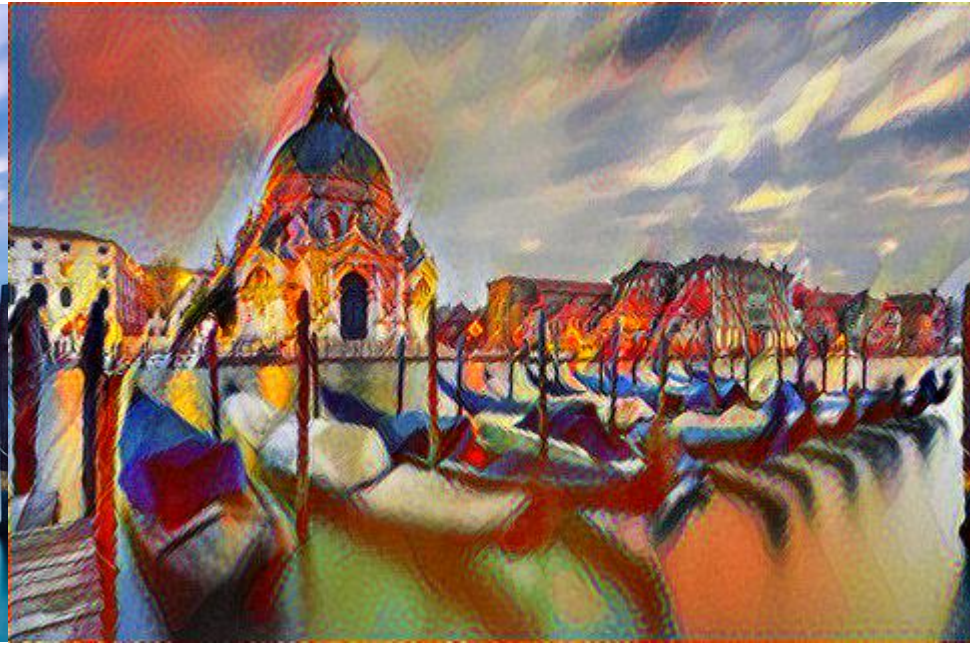
aws

Style Transfer



https://github.com/zhanghang1989/MXNet-Gluon-Style-Transfer/

Style Transfer



https://github.com/zhanghang1989/MXNet-Gluon-Style-Transfer/

aws

Style Transfer

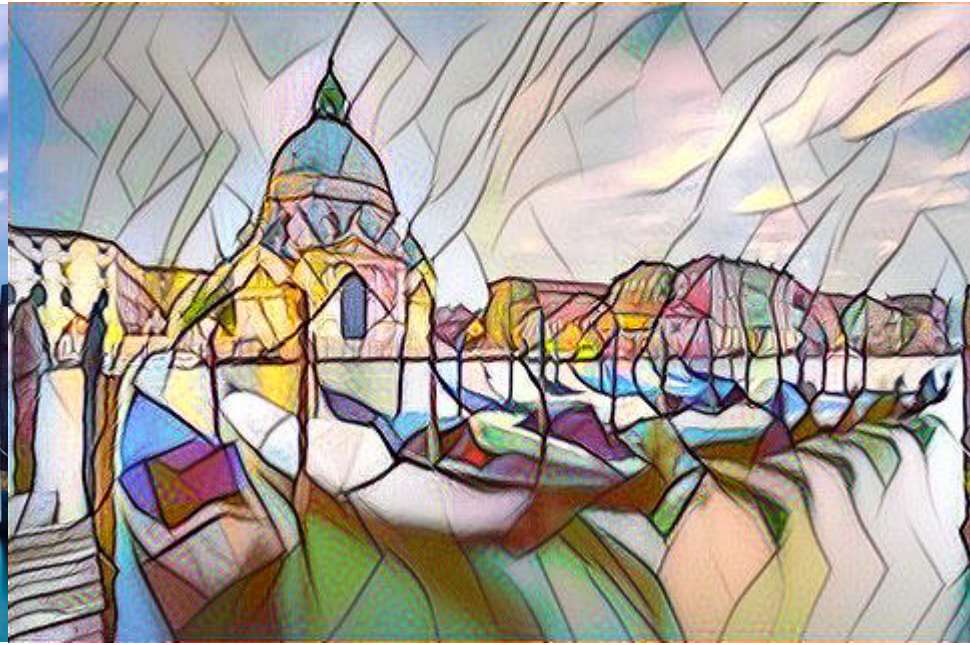
https://github.com/zhanghang1989/MXNet-Gluon-Style-Transfer/

Style Transfer

https://github.com/zhanghang1989/MXNet-Gluon-Style-Transfer/

aws

Style Transfer



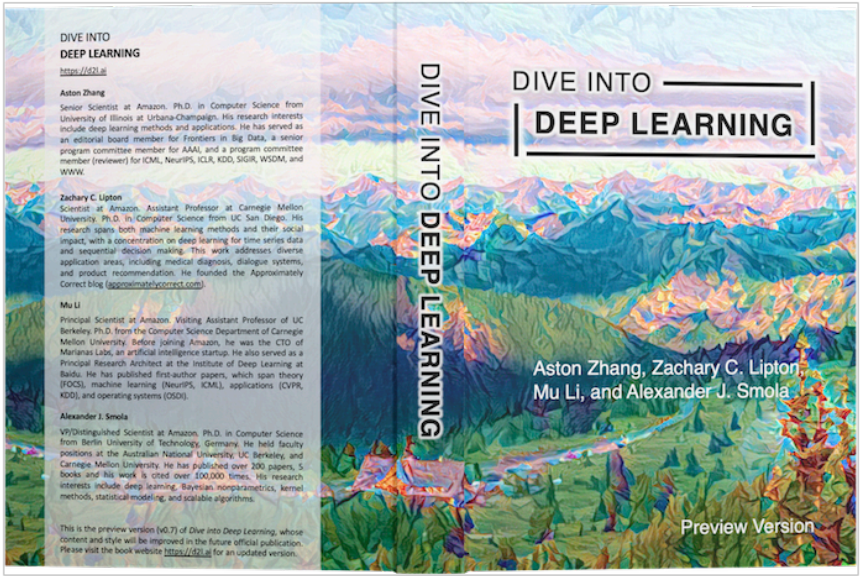
https://github.com/zhanghang1989/MXNet-Gluon-Style-Transfer/

aws

Synthesize Faces

Karras et al, arXiv 2019

D2L Book

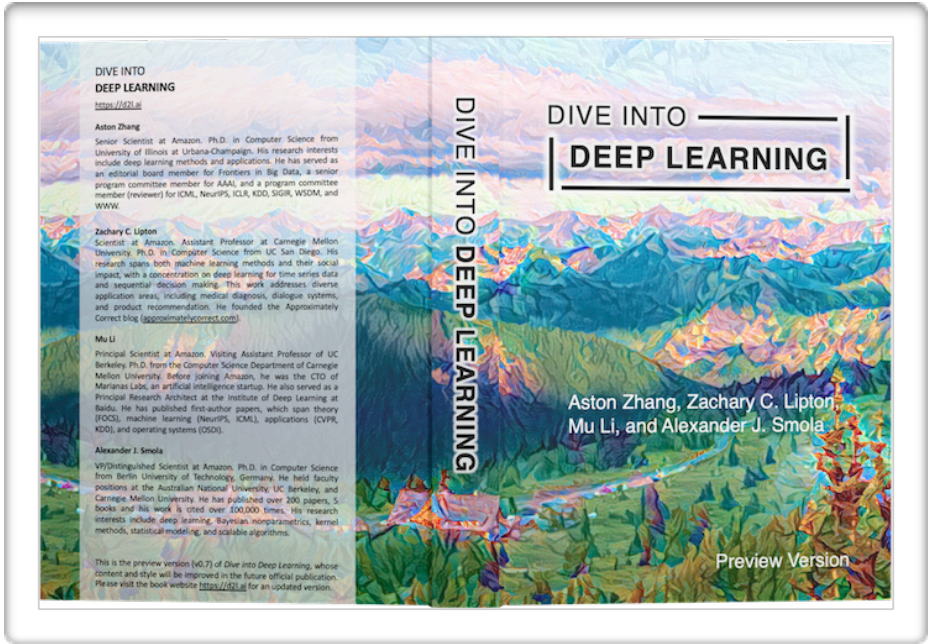


Dive Into Deep Learning is an excellent text on deep learning and deserves attention from anyone who wants to learn why deep learning has ignited the AI revolution – the most powerful technology force of our time.

— Jensen Huang,
President and CEO of Nvidia

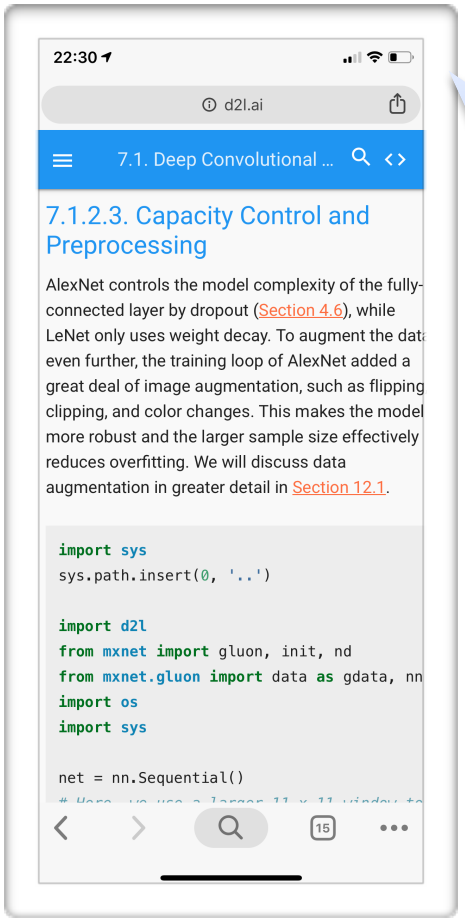
aws

D2L Book



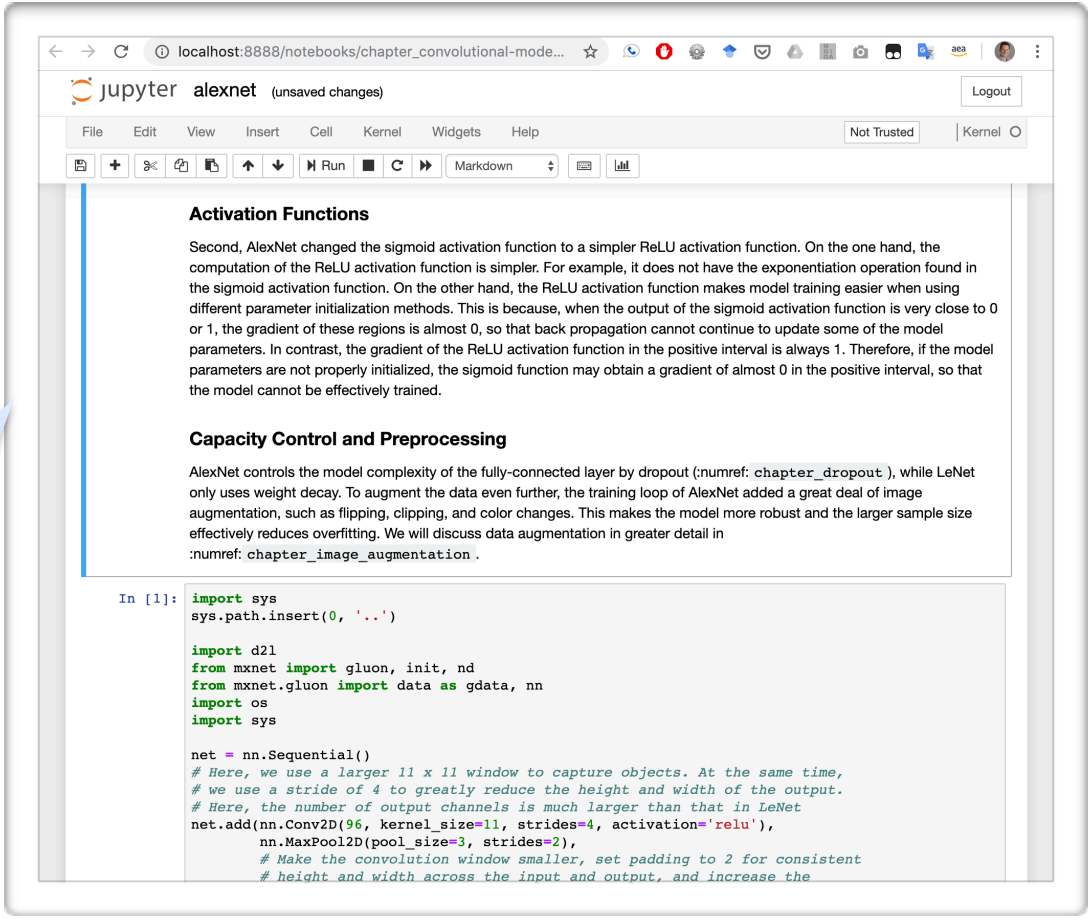
- 150+ runnable Jupyter Notebooks from model architectures to applications (CV, NLP, etc.)
- Adopted as a textbook or reference book at UC Berkeley, CMU, MIT, and 70+ universities worldwide
- Wide theoretical coverage: statistics, optimization, machine learning basics, GPU parallel training, etc.
- Berkeley class (slides, videos at courses.d2l.ai)
- Multilingual content EN, ZH (in progress: KO, JA, FR, TR)

Multiple Formats & Devices



Mobile friendly

Jupyter Notebook



Open Source

d2l-ai / d2l-en

Used by 7 | Unwatch 165 | Star 3.9k | Fork 997

Code | Issues 7 | Pull requests 8 | Actions | Security | Insights

Dive into Deep Learning: an interactive deep learning book with code, math, and discussions, based on the NumPy interface.
https://d2l.ai

deep-learning | machine-learning | book | notebook | computer-vision | natural-language-processing | python | kaggle | data-science

2,184 commits | 7 branches | 0 packages | 3 releases | 83 contributors | View license

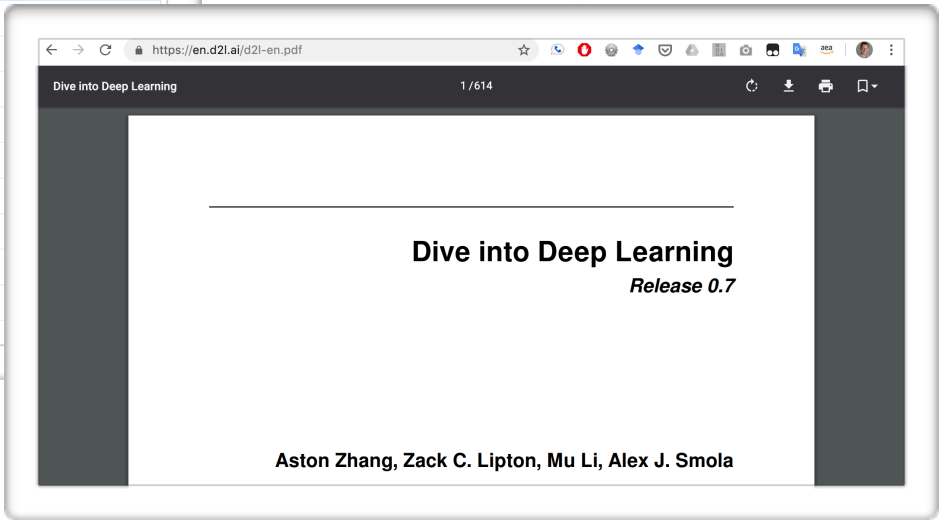
Branch: master | New pull request | Create new file | Upload files | Find file | Clone or download

astonzhang Update README.md — Latest commit 7143d28 8 minutes ago

.github	Update PULL_REQUEST_TEMPLATE.md
chapter_appendix-mathematics-f...	Typo fixes across repository (#730)
chapter_appendix-tools-for-deep-...	polish sagemaker
chapter_attention-mechanisms	Typo fixes across repository (#730)
chapter_computational-performan...	Typo fixes across repository (#730)
chapter_computer-vision	Typo fixes across repository (#730)
chapter_convolutional-modern	Typo fixes across repository (#730)
chapter_convolutional-neural-net...	Typo fixes across repository (#730)
chapter_deep-learning-computati...	Typo fixes across repository (#730)
chapter_generative-adversarial-n...	Typo fixes across repository (#730)

Github:
Active Development

PDF



UC Berkeley STAT157

https://courses.d2l.ai/

STAT 157, Spring 19

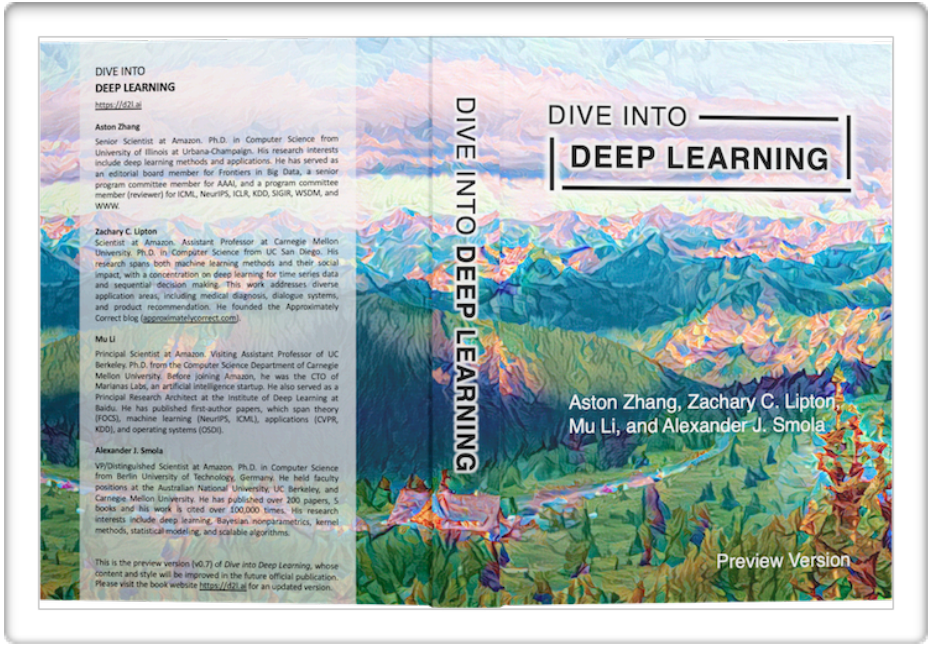
Syllabus

- Syllabus
- Assignments
- Projects
- Units
- FAQ

Syllabus

Date	Topics
1/22	Logistics, Software, Linear Algebra
1/24	Probability and Statistics (Bayes Rule, Sampling Naive Bayes, Sampling)
1/29	Gradients, Chain Rule, Automatic differentiation
1/31	Linear Regression, Basic Optimization
2/5	Likelihood, Loss Functions, Logisitic Regression, Information Theory
2/7	Multilayer Perceptron
2/12	Model Selection, Weight Decay, Dropout
2/14	Numerical Stability, Hardware
2/19	Environment
2/21	Layers, Parameters, GPUs
2/26	Convolutional Layers

Gluon Ecosystem



GluonCV
Computer Vision

GluonNLP
Natural Language

GluonTS
Time Series Prediction

DGL
Deep Learning on Graphs

TVM
Deep Learning Compiler

MXNet
Imperative & Symbolic

aws