

Object Detection in Images using Deep Neural Networks

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Asia University

Robert Layton

Learning Data Mining with Python

Second Edition

Use Python to manipulate data and build
predictive models



Packt>

- Learning Data Mining with Python - Second Edition
- Robert Layton
April 2017
- Chapter 11 : Object Detection in Images using Deep Neural Networks

The CIFAR-10 dataset

Here are the classes in the dataset, as well as 10 random images.

airplane



automobile



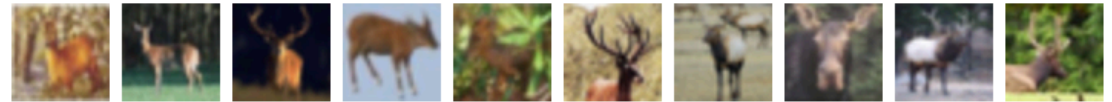
bird



cat



deer



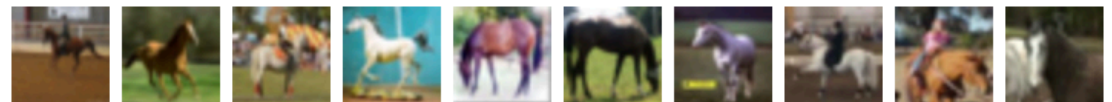
dog



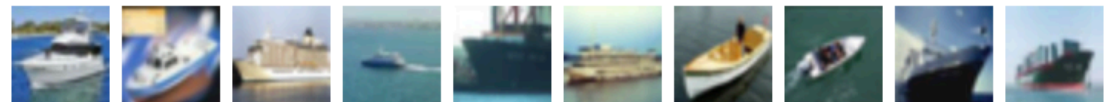
frog



horse



ship



truck



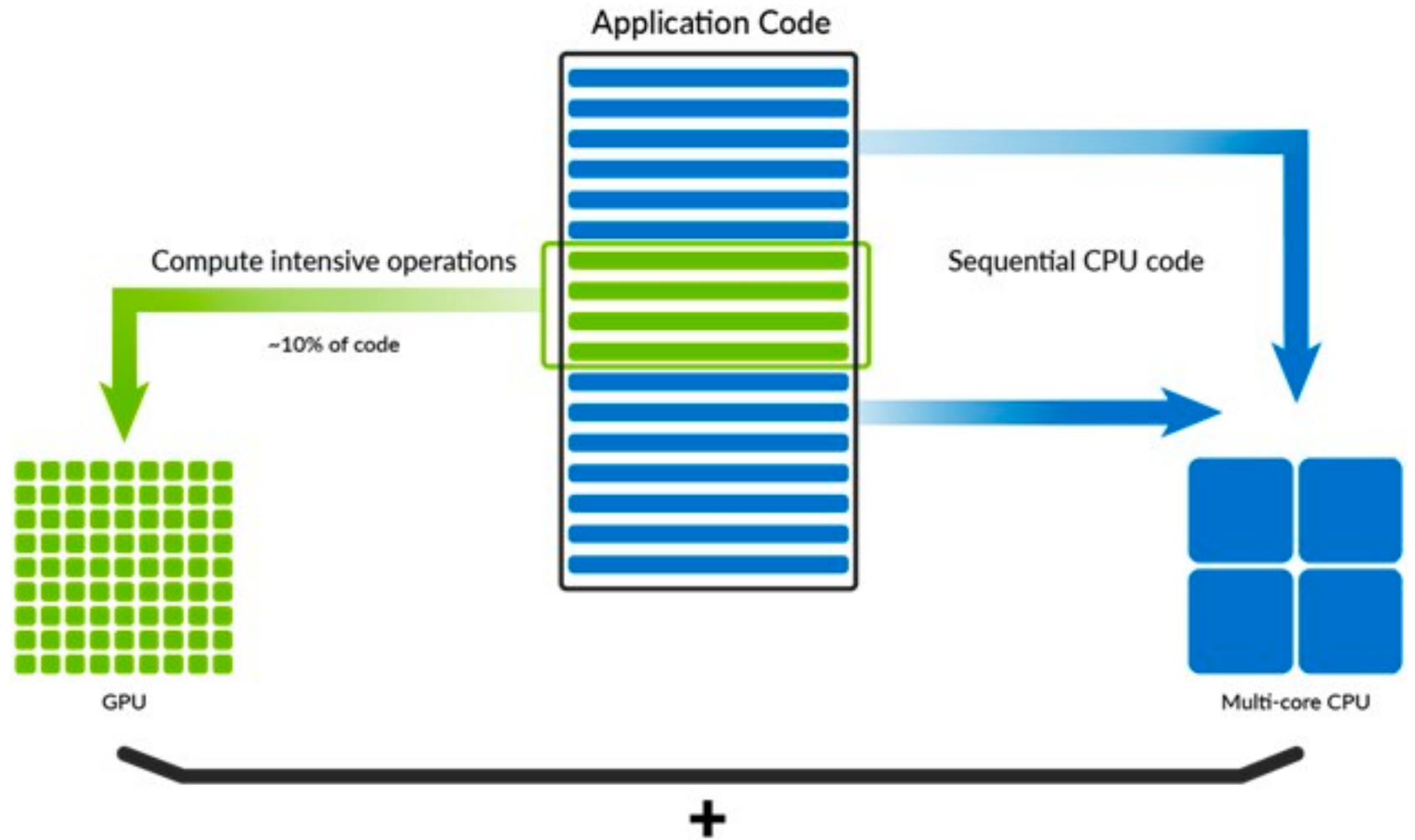
<http://www.cs.toronto.edu/~kriz/cifar.html>

TensorFlow:

- conda install tensorflow (my Mac encounter error)
- Or
- Pip install tensorflow
- <https://www.tensorflow.org/install/>
- StackOverflow user "Yaroslav Bulatov"
<https://stackoverflow.com/questions/38189119/simple-way-to-visualize-a-tensorflow-graph-in-jupyter/38192374#38192374>

How GPU Acceleration Works

GPU
optimization



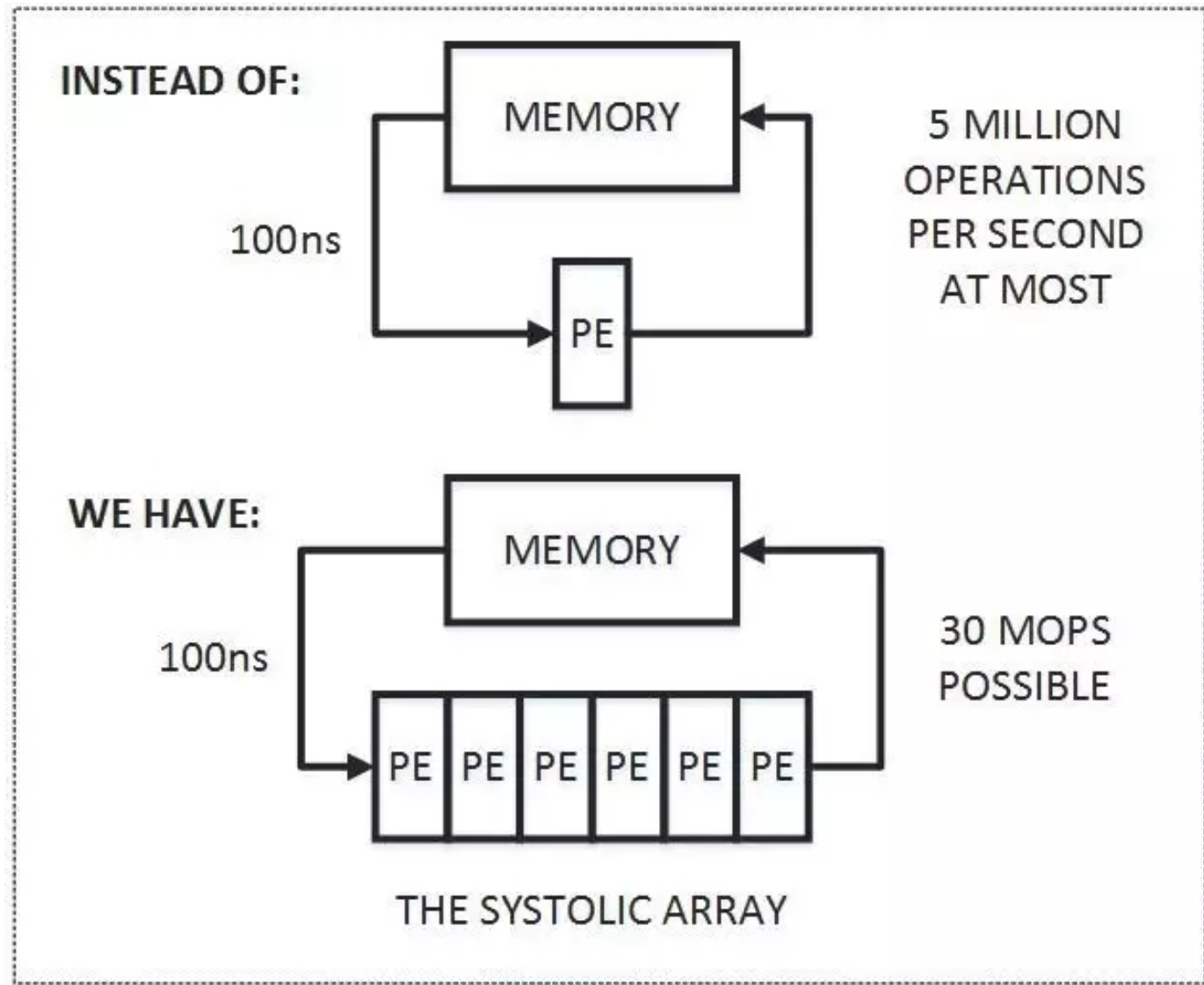
<https://www.kdnuggets.com/2017/08/rise-gpu-databases.html>

TPU: Tensor Processing Unit



<https://technews.tw/2018/01/02/about-google-tpu/>

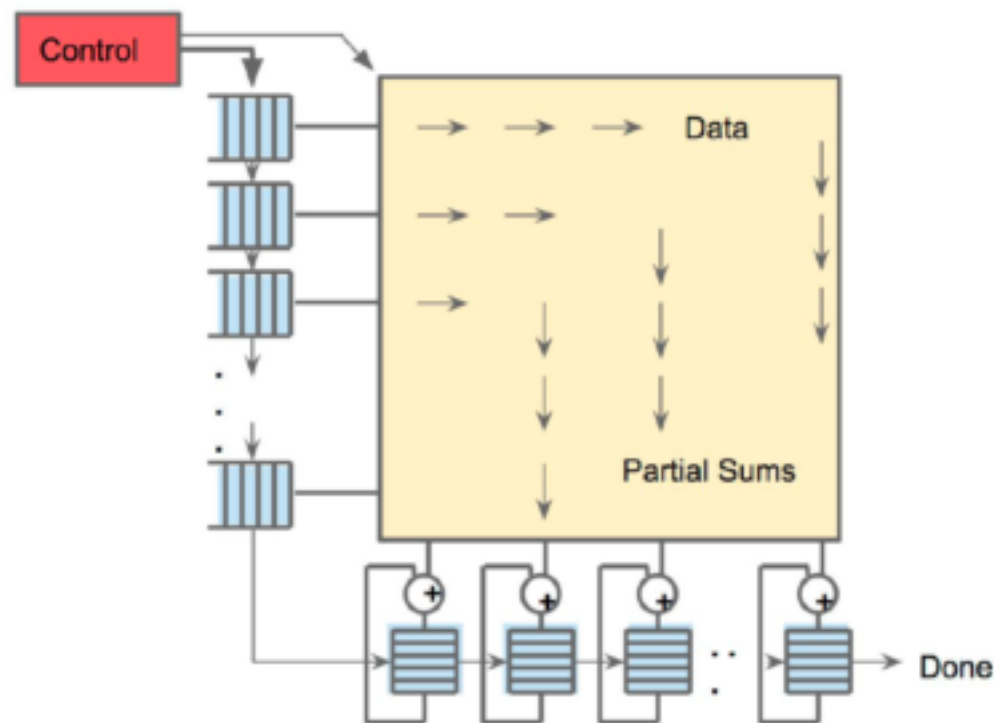
GPU



Systolic Pipeline

(脈動管線)

Systolic Execution: Control and Data are pipelined

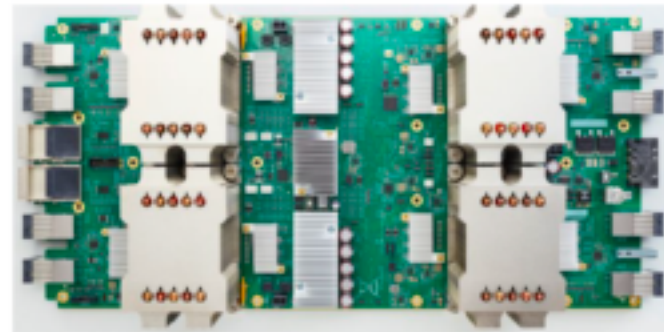


Programmed via TensorFlow

Same program will run with only minor modifications on CPUs, GPUs, & TPUs

Will be Available through Google Cloud

Cloud TPU - virtual machine w/180 TFLOPS TPUv2 device attached



<https://technews.tw/2018/01/02/about-google-tpu/>

→ ↻ ↗ 安全 https://console.aws.amazon.com/console/home?region=us-east-1#

aws Services ^ Resource Groups ^ WANG, CHING TU ^ N. Virginia ^ Support ^

History

Console Home

DynamoDB

AWS Auto Scaling

Billing

EFS

S3

Find a service by name or feature (for example, EC2, S3 or VM, storage).

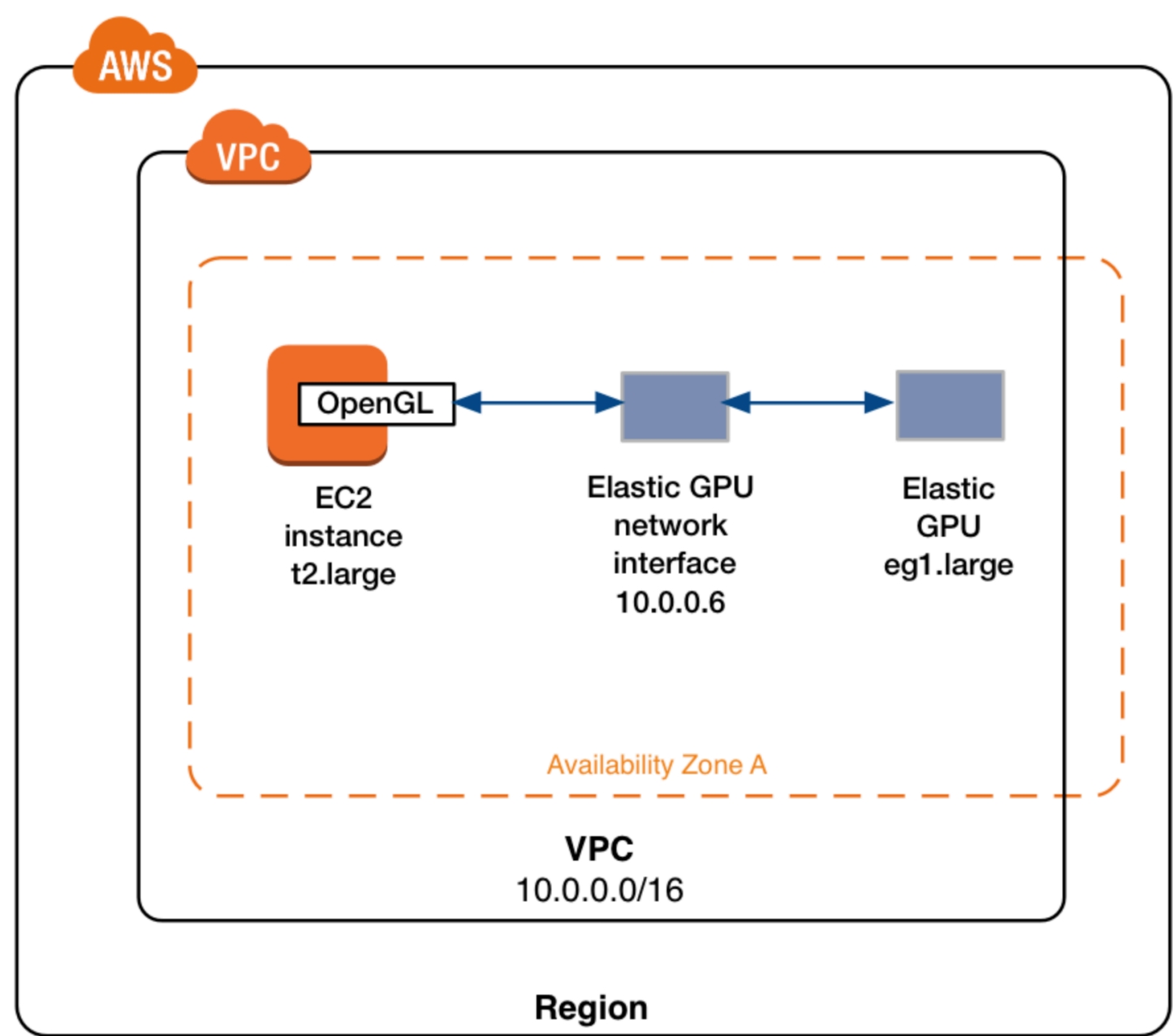
Group A-Z

- Compute**
 - EC2
 - Lightsail ↗
 - Elastic Container Service
 - Lambda
 - Batch
 - Elastic Beanstalk
- Storage**
 - S3
 - EFS
 - Glacier
 - Storage Gateway
- Database**
 - RDS
 - DynamoDB
 - ElastiCache
 - Amazon Redshift
- Migration**
 - AWS Migration Hub
 - Application Discovery Service
- Developer Tools**
 - CodeStar
 - CodeCommit
 - CodeBuild
 - CodeDeploy
 - CodePipeline
 - Cloud9
 - X-Ray
- Management Tools**
 - CloudWatch
 - AWS Auto Scaling
 - CloudFormation
 - CloudTrail
 - Config
 - OpsWorks
 - Service Catalog
 - Systems Manager
 - Trusted Advisor
 - Managed Services
- Media Services**
 - Elastic Transcoder
 - Kinesis Video Streams
- Machine Learning**
 - Amazon SageMaker
 - Amazon Comprehend
 - AWS DeepLens
 - Amazon Lex
 - Machine Learning
 - Amazon Polly
 - Rekognition
 - Amazon Transcribe
 - Amazon Translate
- Analytics**
 - Athena
 - EMR
 - CloudSearch
 - Elasticsearch Service
 - Kinesis
 - QuickSight ↗
 - Data Pipeline
 - AWS Glue
- Security, Identity & Compliance**
 - IAM
- Mobile Services**
 - Mobile Hub
 - AWS AppSync
 - Device Farm
 - Mobile Analytics
- AR & VR**
 - Amazon Sumerian
- Application Integration**
 - Step Functions
 - Amazon MQ
 - Simple Notification Service
 - Simple Queue Service
 - SWF
- Customer Engagement**
 - Amazon Connect
 - Pinpoint
 - Simple Email Service
- Business Productivity**

AWS console

<https://console.aws.amazon.com/console/home?region=us-east-1#>

Running with GPU on an Amazon's EC2 service.





Ubuntu x64 AMI with TensorFlow (GPU)

Sold by: [Altoros Systems](#) Latest Version: 4.0

Ubuntu x64 AMI with TensorFlow (GPU)

Linux/Unix ★☆☆☆☆ (1)

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Typical Total Price

\$0.650/hr

Total pricing per instance for services hosted on g2.2xlarge in US East (N. Virginia). [View Details](#)

[Overview](#)

[Pricing](#)

[Usage](#)

[Support](#)

[Reviews](#)

Product Overview

Ubuntu with installed TensorFlow, CUDA driver, toolkit, CuDNN, Jupyter

Version	4.0
	Show other versions
Sold by	Altoros Systems
Categories	Education & Research High Performance Computing
Operating System	Linux/Unix, Ubuntu Ubuntu Server 16.04 LTS
Fulfillment Methods	Amazon Machine Image

Highlights

- Allows users to take advantage of fast neural network
- Installed Jupyter, Keras, SkFlow, TFLearn with dependencies
- Registration is not required for third-party software

https://aws.amazon.com/marketplace/pp/B01H1VWUOY?qid=1485755720051&sr=o-1&ref_=srh_res_product_title

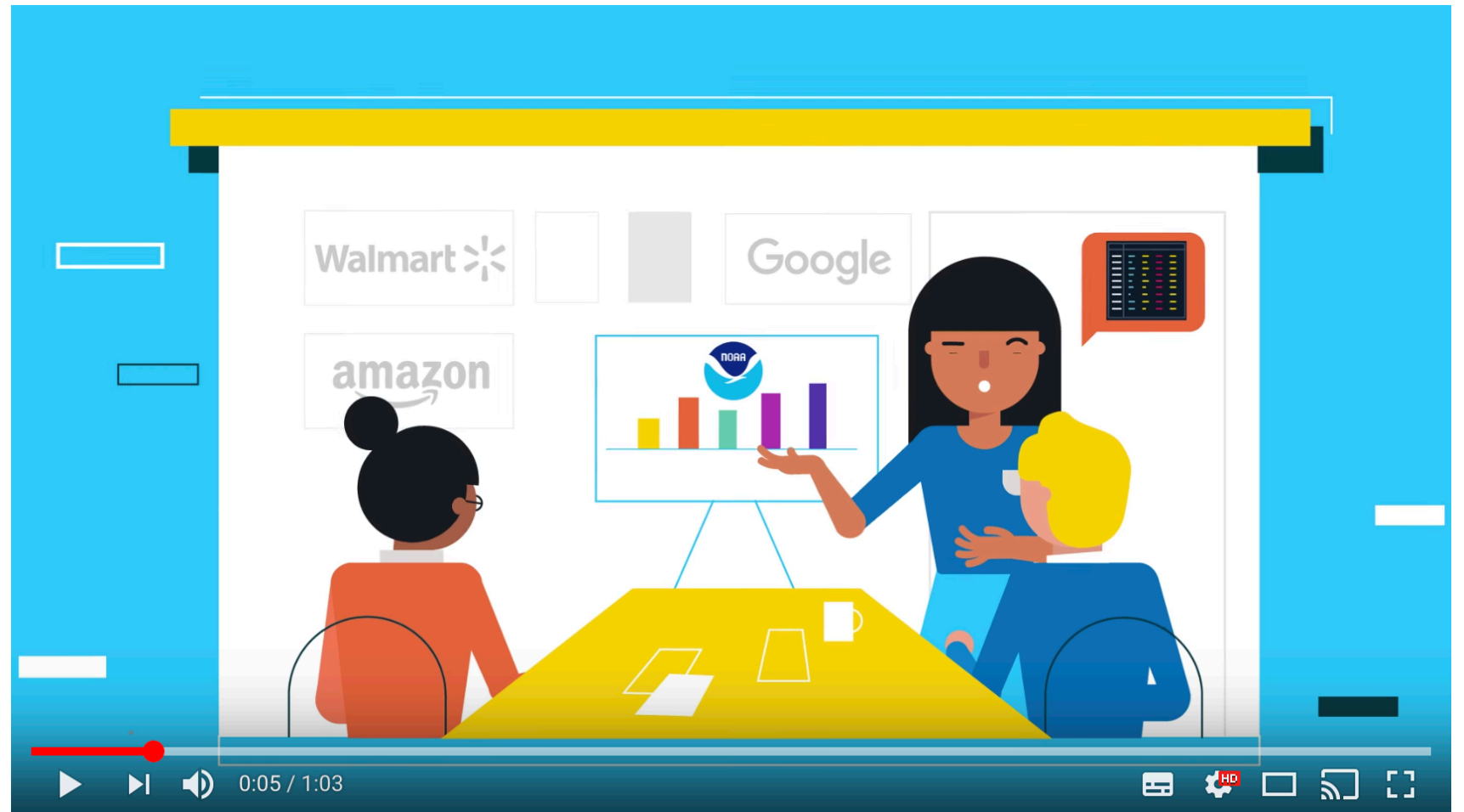
Python Deep Learning

- <https://github.com/PacktPublishing/Python-Deep-Learning>
- https://www.packtpub.com/sites/default/files/downloads/PythonDeepLearning_ColorImages.pdf

Machine Learning

- Supervised Learning
- Unsupervised Learning
- Reinforcement Learning

What's Kaggle?



<https://www.kaggle.com/>

https://www.youtube.com/watch?time_continue=5&v=AoRSldLpFqU