Superpower User Manual

Marc Cohen
mco@google.com
@marcacohen
mcohen.io

bit.ly/mco-superpowers

1. ML Background
2. My First Superpower
3. Superpowered Services
4. Superpowered App
5. Superpowered Learning

Machine Learning Background

“The brown quick fox jumps over the lazy dog.”

Syntax rules for adjective order in English:

- Quantity or number
- Quality or opinion
- Size
- Age
- Shape
- Colour
- Proper adjective (often nationality, other place of origin, or material)
- Purpose or qualifier

Machine learning is learning

from ***examples*** and ***experience***.

“Instead of trying to produce a programme to simulate the adult mind, why not rather try to produce one which simulates the child's?”

- Alan Turing, 1950

Cats vs. Dogs

2009: *Chris Bishop: Even the most sophisticated computers can't tell a dog from a cat*

2012: *How Many Computers to Identify a Cat? 16,000*

2015: Microsoft, Google Beat Humans at Image Recognition

2016: Machine Learning Algorithms Outperform Inexperienced Radiologists

Just this month...

—

Google AI can spot advanced breast cancer more effectively than humans

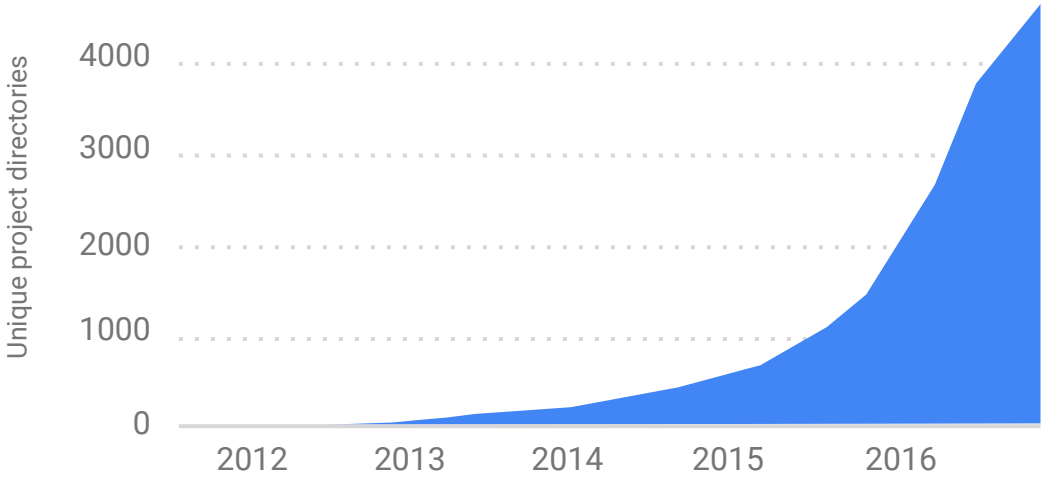
It's up to 99 percent accurate in the right conditions.

Revolution

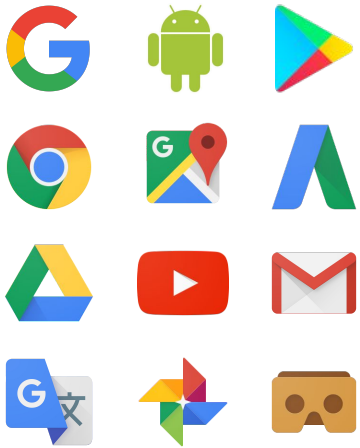
- Moore’s Law + GPUs
- Cloud computing
- More/richer data
- Github + Open Source
- New/refined techniques
- “Perfect Storm”

Rapidly accelerating use of deep learning at Google

Directories containing **Deep Learning Models**



Used across products:



My First Superpower


basic basic
AN INTRODUCTION TO COMPUTER PROGRAMMING
IN BASIC LANGUAGE
second edition
JAMES S. COAN
FLIP-I
2 FØR Y=1 TØ 10
5 LET C=0
10 FØR X=1 TØ 50
20 LET F=INT(2*RND(1))
30 IF F=1 THEN 60
40 PRINT "T";
50 GØTØ 100
58 REM C CØUNTS THE NUMBER ØF HEADS
60 LET C=C+1
70 PRINT "H";
100 NEXT X
110 PRINT
120 PRINT "HEADS "; C; "ØUT ØF 50 FLIPS"
125 NEXT Y
130 END
RUN
FLIP-I
HEADS 21 ØUT ØF 50 FLIPS
HEADS 26 ØUT ØF 50 FLIPS
HEADS 17 ØUT ØF 50 FLIPS
HEADS 21 ØUT ØF 50 FLIPS
HEADS 24 ØUT ØF 50 FLIPS
HEADS 26 ØUT ØF 50 FLIPS
HEADS 22 ØUT ØF 50 FLIPS
HEADS 34 ØUT ØF 50 FLIPS
HEADS 24 ØUT ØF 50 FLIPS
HEADS 26 ØUT ØF 50 FLIPS
ØKNE
HAYDEN

saved
share
run

main.py

```
1  from __future__ import division
2  from __future__ import print_function
3  from random import shuffle
4  from itertools import islice
5
6  def sequence(n):
7      x = range(1, n+1)
8      shuffle(x)
9      return x
10
11 def interview_optimal(seq, num_to_skip):
12     iterator = iter(seq)
13     thresh = min(islice(iterator, num_to_skip))
14     for i in iterator:
15         if i < thresh:
16             break
17     return i
18
19 num_trials = 100
20 seq_len = 100
21 best_skip_proportion = 0
22 best_success_rate = 0
23 #for num_to_skip in range(int(.3*seq_len), int(.4*seq_len)):
24 for num_to_skip in range(1, seq_len):
```

```
Python 2.7.10 (default, Jul 14
2015, 19:46:27)
[GCC 4.8.2] on linux
>
```

The real world...

Kubernetes Engine Tutorials

Deploying a containerized web application

☆ ☆ ☆ ☆ ☆

SEND FEEDBACK

This tutorial shows you how to package a web application in a Docker container image, and run that container image on a Kubernetes Engine cluster as a load-balanced set of replicas that can scale to the needs of your users.

Objectives

To package and deploy your application on Kubernetes Engine, you must:

1. Package your app into a Docker image
2. Run the container locally on your machine (optional)
3. Upload the image to a registry
4. Create a container cluster
5. Deploy your app to the cluster
6. Expose your app to the Internet
7. Scale up your deployment
8. Deploy a new version of your app

Why is it so COMPLICATED?

1. Hardware provisioning
2. Software installation
3. OS upgrades
4. Security patches
5. System & network admin
6. Scaling up & down
7. Paying for stuff you don't use
8. Dealing with failures
9. Managing clusters
10. Packages and containers
11. CAP Theorem
12. Load Balancing
13. Service Mesh
14. Data Sharding
15. Backup and Recovery
16. Authentication & Authorization
17. Hybrid Operation
18. Multiple servers, disks, network
19. ...

Google Cloud

Developer Cheat Sheet

v2018.9.14

Created by the Google Developer Relations Team

Maintained at https://medium.com/@gregsramblings

@gregsramblings

Sites and Blogs

Google Cloud Home Page	https://cloud.google.com
Google Cloud Blog	https://cloud.google.com/blog
GCP Medium Publication	https://medium.com/google-cloud
Apigee Blog	https://apigee.com/about/blog
Firebase Blog	https://firebase.googleblog.com
G Suite Developers Blog	https://gsuite-developers.googleblog.com
GCP .NET Home	https://cloud.google.com/dotnet
GCP Go Home	https://cloud.google.com/go
GCP Java Home	https://cloud.google.com/java
GCP Node Home	https://cloud.google.com/node
GCP PHP Home	https://cloud.google.com/php
GCP Python Home	https://cloud.google.com/python
GCP Ruby Home	https://cloud.google.com/ruby
Google Cloud Certifications	https://cloud.google.com/certification
Google Cloud System Status	https://status.cloud.google.com
Google Cloud Training	https://cloud.google.com/training
Google Codelabs	https://codelabs.developers.google.com
Google Developers Blog	https://developers.googleblog.com
Google Maps Platform Blog	https://mapsplatform.googleblog.com
Google Open Source Blog	https://opensource.googleblog.com
Google Security Blog	https://security.googleblog.com
Kaggle Home Page	https://www.kaggle.com
Kubernetes Blog	https://kubernetes.io/blog
Regions and Network Map	https://cloud.google.com/about/locations

Podcasts

GCP Podcast	https://gcppodcast.com
Kubernetes Podcast	https://kubernetespodcast.com

YouTube Channels

Google Cloud Platform	https://www.youtube.com/googlecloudplatform
Google Developers	https://www.youtube.com/GoogleDevelopers
G Suite	https://www.youtube.com/GSuite
Apigee	https://www.youtube.com/apigee/
Firebase	https://www.youtube.com/firebase

Compute Products

Compute Engine	Virtual Machines, Disks, Network
App Engine	Managed App Platform
Kubernetes Engine	Managed Kubernetes/Containers
Shielded VMs	Hardened VMs
Cloud Functions	Event-driven serverless functions

Identity and Security Products

Access Transparency	Audit Cloud Provider Access
Cloud Data Loss Prevention API	Classify, Redact Sensitive Data
Cloud IAM	Resource Access Control
Cloud Identity	Manage Users, Devices & Apps
Cloud Identity-Aware Proxy	Identity-based App Signin
Cloud Key Management Service	Hosted Key Management Service
Cloud Resource Manager	Cloud Project Metadata Management
Cloud Security Scanner	App Engine Security Scanner
Security Key Enforcement	Two-step Key Verification
Titan Security Key	Two-factor Authentication (2FA) Device

Management Tools Products

Cloud APIs	APIs for Cloud Services
Cloud Billing	Billing and Cost Management Tools
Cloud Billing API	Programmatically Manage GCP Billing
Cloud Console	Web-based Management Console
Cloud Deployment Manager	Templated Infrastructure Deployment
Cloud Mobile App	iOS/Android GCP Manager App
Cloud Shell	Browser-based Terminal/CLI
Stackdriver Debugger	Live Production Debugging
Stackdriver Error Reporting	App Error Reporting
Stackdriver Logging	Centralized Logging
Stackdriver Monitoring	Infrastructure and Application Monitoring
Stackdriver Profiler	CPU and heap profiling
Stackdriver Transparent SLIs	Monitor GCP Services
Stackdriver Trace	App Performance Insights

Developer Tools

Cloud SDK	CLI for GCP
Cloud Build	Continuous integration/delivery platform
Cloud Source Repositories	Hosted Private Git Repos
Cloud Tools for IntelliJ	IntelliJ GCP Tools
Cloud Tools for PowerShell	PowerShell GCP Tools
Cloud Tools for Visual Studio	Visual Studio GCP Tools
Cloud Tools for Eclipse	Eclipse GCP Tools
Container Registry	Private Container Registry/Storage
Gradle App Engine Plugin	Gradle App Engine Plugin
Maven App Engine Plugin	Maven App Engine Plugin

Migration (to GCP)

Google Transfer Appliance	Rentable Data Transport Box

AI and Machine Learning

Cloud AutoML Natural Language	Custom text classification models
Cloud AutoML Translate	Custom domain-specific translation
Cloud AutoML Vision	Custom image classification models
Cloud Job Discovery	Job Search with ML
Cloud Machine Learning Engine	Managed Platform for ML
Cloud Natural Language	Text Parsing and Analysis
Cloud Speech-To-Text	Convert Audio to Text
Cloud Text-To-Speech	Convert Text to Audio
Cloud TPU	Specialized Hardware for ML
Cloud Translation API	Language Detection and Translation
Cloud Video Intelligence	Scene-level Video Annotation
Cloud Vision API	Image Recognition and Classification
Dialogflow Enterprise Edition	Create Conversational Interfaces

Data and Analytics Products

Cloud Composer	Managed Workflow Orchestration Service
Cloud Dataflow	Stream/batch data processing
Cloud Datalab	Managed Jupyter Notebook
Cloud Dataprep	Visual data wrangling
Cloud Dataproc	Managed Spark and Hadoop
Cloud Pub/Sub	Global Real-time Messaging
Google BigQuery	Data Warehouse/Analytics
Google Data Studio	Collaborative Data Exploration/Dashboarding
Google Genomics	Managed Genomics Platform

Databases Products

Cloud Bigtable	Petabyte-scale, low-latency nonrelational
Cloud Datastore	Horizontally Scalable Document DB
Cloud Firestore	Strongly-consistent Serverless Document DB
Cloud Memorystore	Managed Redis
Cloud Spanner	Horizontally Scalable Relational DB
Cloud SQL	Managed MySQL and PostgreSQL

Storage Products

Cloud Storage	Object Storage and Serving
Nearline	Archival Occasional Access Storage
Coldline	Archival Rare Access Storage
Persistent Disk	VM-attached Disks
Cloud Filestore	Managed NFS Server

Networking Products

Carrier Peering	Peer with a carrier
Direct Peering	Peer with GCP
Dedicated Interconnect	Dedicated private network connection
Partner Interconnect	Connect on-premises network to VPC
Cloud Armor	DDoS Protection
Cloud CDN	Content Delivery Network
Cloud DNS	Programmable DNS Serving

Google Maps Platform

Directions API	Get Directions Between Locations
Distance Matrix API	Calculate Travel Times
Geocoding API	Convert Address to/from Coordinates
Geolocation API	Derive Location Without GPS
Maps Embed API	Web Embedded Maps
Maps JavaScript API	Dynamic Web Maps
Maps SDK for Android	Maps SDK for Android
Maps SDK for iOS	Maps SDK for iOS
Maps Static API	Web Static Maps
Maps Unity SDK	Unity SDK for Games
Maps URLs	URL Scheme for Maps
Places API	Metadata About Places (REST)
Places Library, Maps JavaScript API	Metadata About Places (JavaScript)
Places SDK for Android	Places SDK for Android
Places SDK for iOS	Places SDK for iOS
Roads API	Metadata About Roads
Street View API	Street View API
Time Zone API	Convert Coordinates to Timezone

G Suite Platform

App Maker	Assistive App Building
Apps Script	Extend and Automate Everything
Editor Add-ons	Extend Docs, Sheets, Slides
Gmail Add-ons	Contextual Apps in Gmail
Hangouts Chat Bots	Conversational Bots in Chat
Calendar API	Create and Manage Calendars
Classroom API	Provision and Manage Classrooms
Drive API	Read and Write Files
Gmail API	Enhance Gmail and Inbox
Sheets API	Read and Write Spreadsheets
Slides API	Create and Edit Presentations
Drive Picker	Drive File Selection Widget
Admin SDK	Manage G Suite Settings
Email Markup	Interactive Email using Schema.org
G Suite Marketplace	Storefront for Integrated Applications
Other G Suite APIs/SDKs	Contacts, Google+, Tasks, Vault...

Mobile Products (Firebase)

Cloud Firestore	Document Store and Sync
Cloud Functions for Firebase	Event-driven Serverless Applications
Cloud Storage for Firebase	Object Storage and Serving
Crashlytics	Crash Reporting and Analytics
Firebase A/B Testing	Create A/B Test Experiments
Firebase App Indexing	App / Google Search Integration
Firebase Authentication	Drop-in Authentication
Firebase Cloud Messaging	Send Device Notifications
Firebase Dynamic Links	Link to App Content
Firebase Hosting	Web Hosting with CDN/SSL

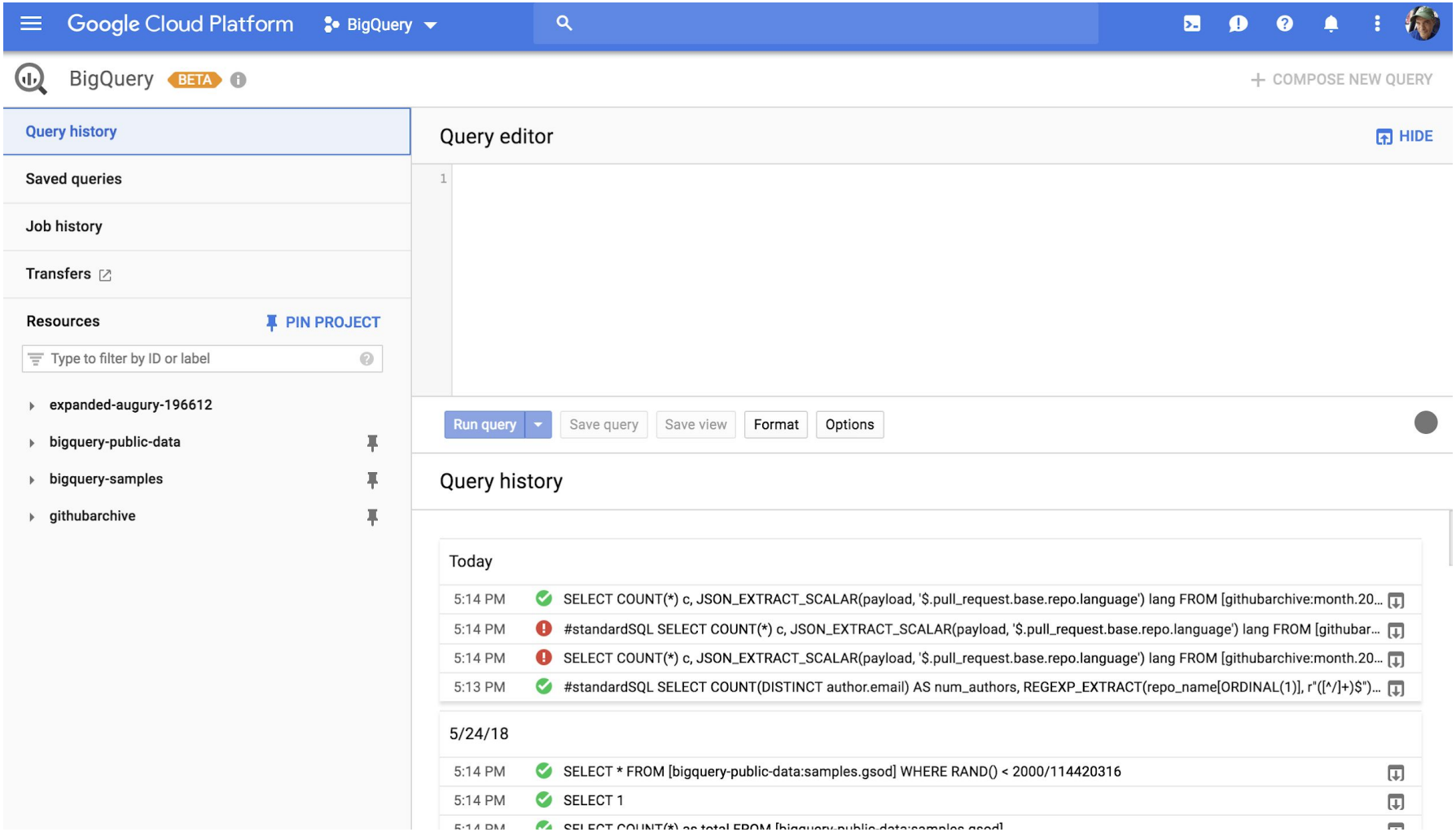
What I want:

- ✓ **S**ervices, not servers
- ✓ **U**nlimited automatic scaling
- ✓ **P**ay only for what I use
- ✓ **E**ndlessly extensible
- ✓ **R**elegate infrastructure

In other words...

1. I don’t want to think about stuff I don’t care about, and...
2. I want to specify the “what”, not the “how”.

Superpowered Services


Google Cloud Platform
BigQuery
BigQuery BETA
COMPOSE NEW QUERY
Query history
Saved queries
Job history
Transfers
Resources
PIN PROJECT
Type to filter by ID or label
expanded-augury-196612
bigquery-public-data
bigquery-samples
githubarchive
Query editor
HIDE
1
Run query
Save query
Save view
Format
Options
Query history
Today
5:14 PM SELECT COUNT(*) c, JSON_EXTRACT_SCALAR(payload, '$.pull_request.base.repo.language') lang FROM [githubarchive:month.20...
5:14 PM #standardSQL SELECT COUNT(*) c, JSON_EXTRACT_SCALAR(payload, '$.pull_request.base.repo.language') lang FROM [githubar...
5:14 PM SELECT COUNT(*) c, JSON_EXTRACT_SCALAR(payload, '$.pull_request.base.repo.language') lang FROM [githubarchive:month.20...
5:13 PM #standardSQL SELECT COUNT(DISTINCT author.email) AS num_authors, REGEXP_EXTRACT(repo_name[ORDINAL(1)], r"([^/]+)$")...
5/24/18
5:14 PM SELECT * FROM [bigquery-public-data:samples.gsod] WHERE RAND() < 2000/114420316
5:14 PM SELECT 1

The **HTTP Archive** Tracks How the **Web is Built.**

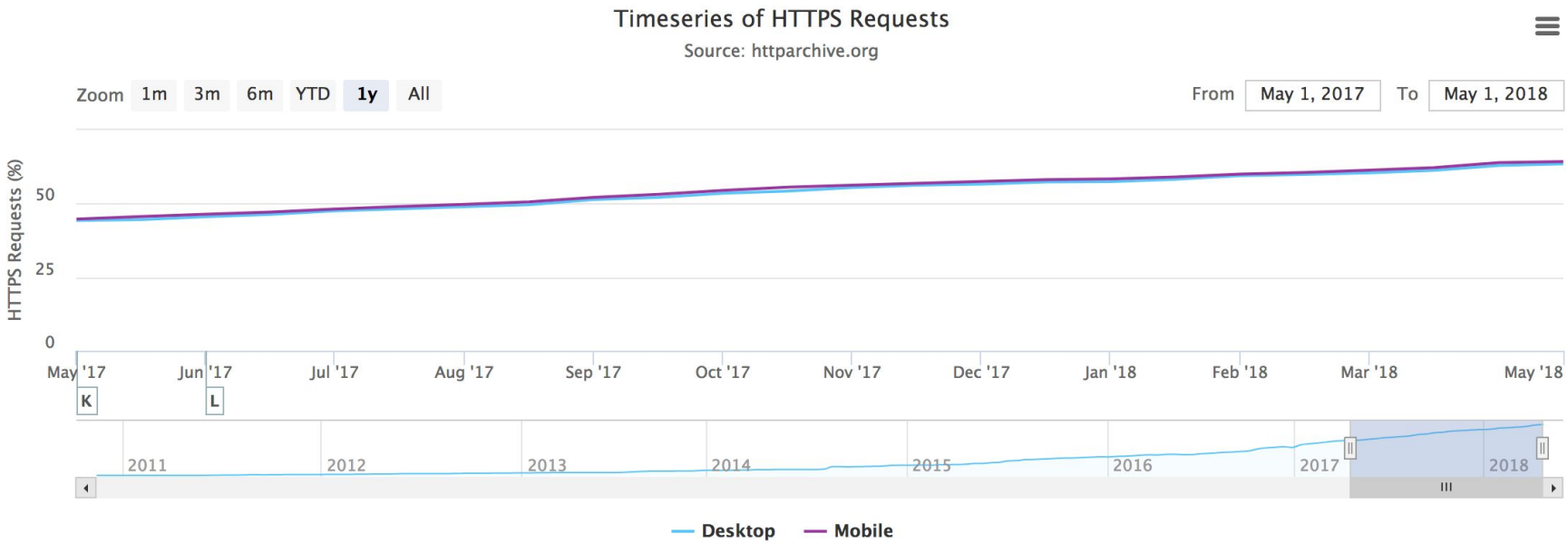
We periodically crawl the top sites on the web and record detailed information about fetched resources, used web platform APIs and features, and execution traces of each page. We then crunch and analyze this data to identify trends — learn more about our methodology.

View Reports

HTTPS Requests

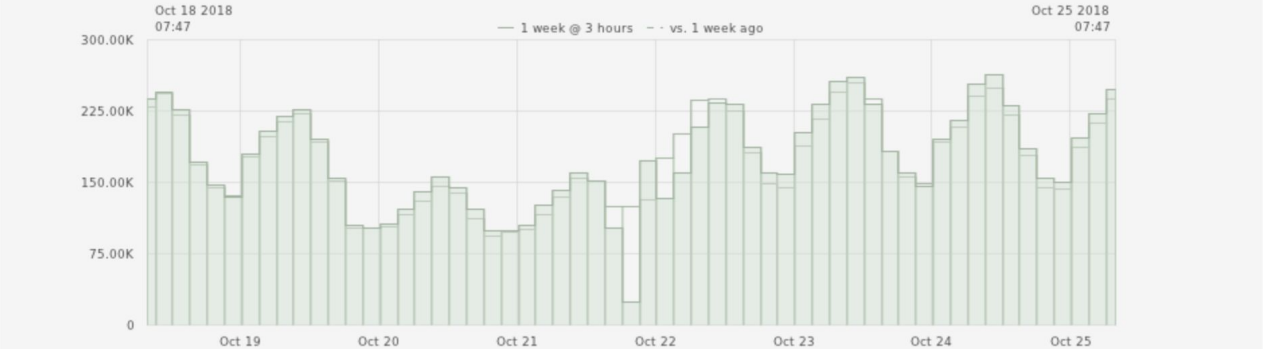
The percent of all requests in the crawl whose URLs are prefixed with `https`.

DESKTOP	MOBILE
63.5%	64.3%
▲43.3%	▲43.8%



Show Table

GH Archive



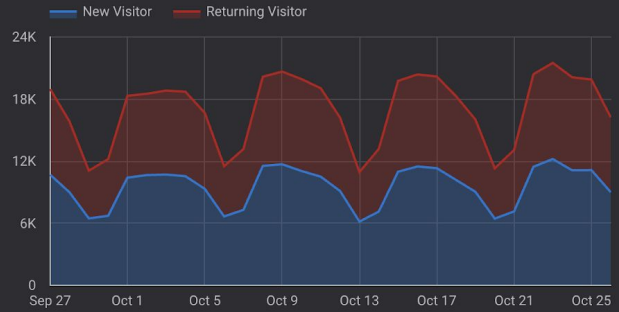
Open-source developers all over the world are working on millions of projects: writing code & documentation, fixing & submitting bugs, and so forth. GH Archive is a project to **record** the public GitHub timeline, **archive it**, and **make it easily accessible** for further analysis.

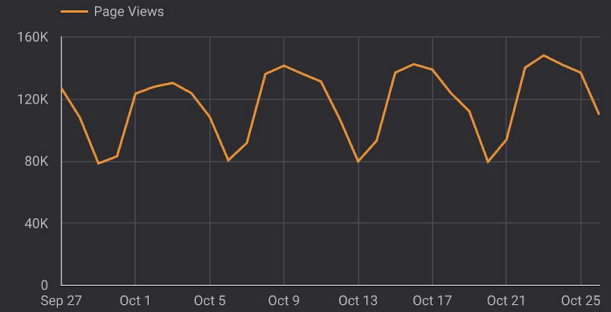
GitHub provides 20+ event types, which range from new commits and fork events, to opening new tickets, commenting, and adding members to a project. These events are aggregated into hourly archives, which you can access with any HTTP client:

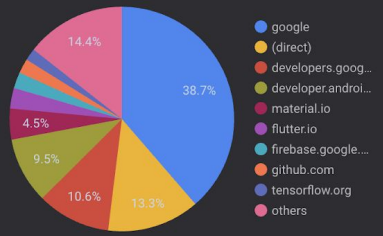
Query	Command
Activity for 1/1/2015 @ 3PM UTC	`wget http://data.gharchive.org/2015-01-01-15.json.gz`
Activity for 1/1/2015	`wget http://data.gharchive.org/2015-01-01-{0..23}.json.gz`
Activity for all of January 2015	`wget http://data.gharchive.org/2015-01-{01..31}-{0..23}.json.gz`

Google Codelabs Usage Trends

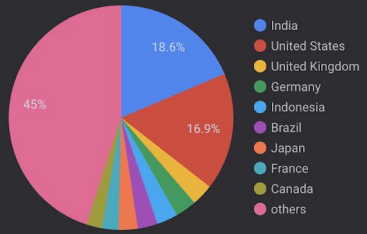
Codelabs | Environment | Sep 27, 2018 - Oct 26, 2018
Source | Country



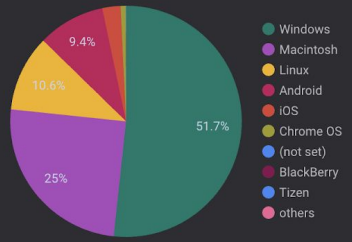




Sources



Countries



Operating System

Machine Learning as an API

Cloud
Vision API

Cloud
Speech API

Cloud
Natural Language
API

Cloud
Translation API

Cloud Video
Intelligence API

Use your own data to train models

TensorFlow

Cloud Machine
Learning Engine

Faces | Labels | Web | Text | Document | Properties | Safe Search | JSON

AutoML

Cloud AutoML

Cloud AutoML makes the power of machine learning available to you even if you have limited knowledge of machine learning. You can use AutoML to build on Google's machine learning capabilities to create your own custom machine learning models that are tailored to your business needs, and then integrate those models into your applications and web sites.

You can use the following AutoML products to create custom machine learning models:

Cloud AutoML Products

AutoML Natural Language

AutoML Natural Language enables you to train your own, custom machine learning models to classify documents according to labels that you define.

AutoML Translation

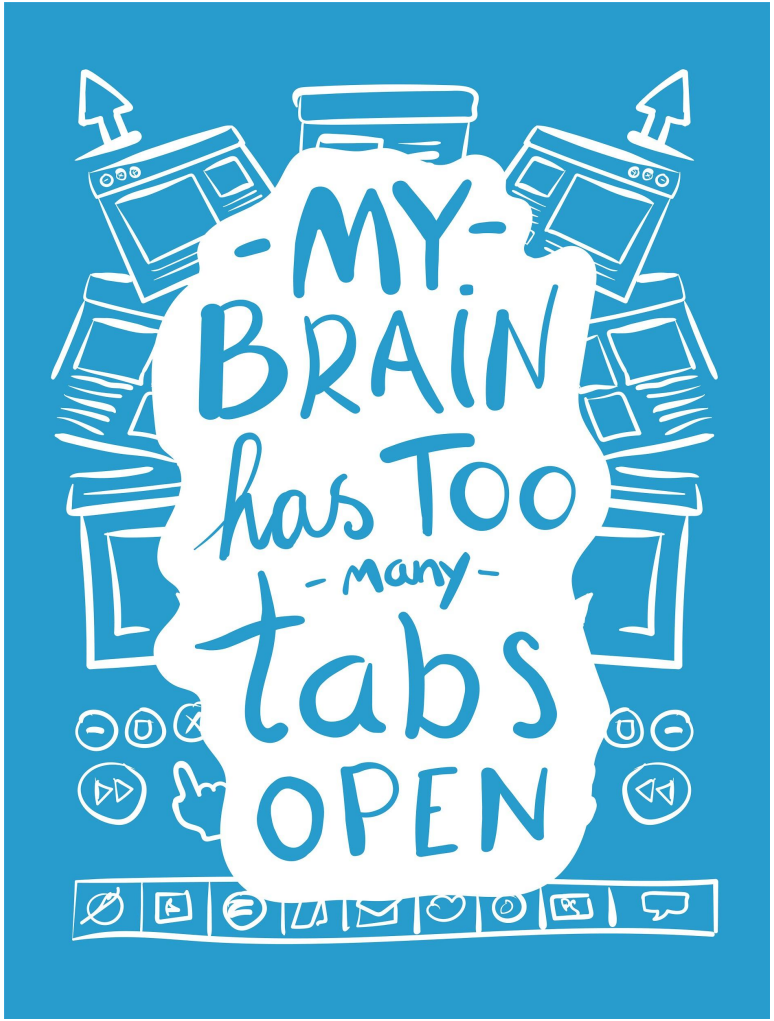
AutoML Translation enables you to create your own, custom translation models so that translation queries return results specific to your domain.

AutoML Vision

AutoML Vision enables you to train your own, custom machine learning models to classify your images according to labels that you define.

The Meiko Detector

Superpowered App


-MY-
BRAIN
has TOO
-many-
tabs
OPEN

curate[2]

/kjʊ(ə)ˈreɪt/

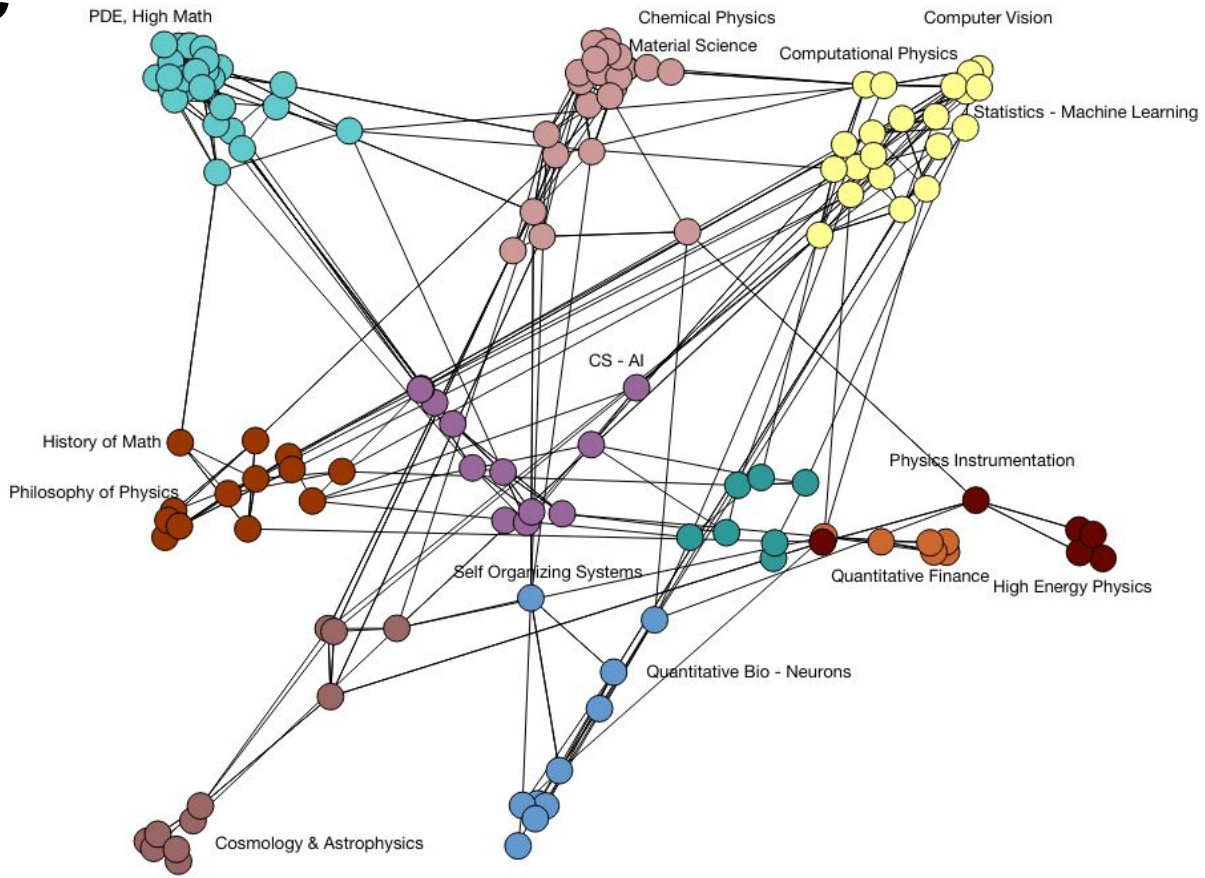
verb

verb: **curate**; 3rd person present: **curates**; past tense: **curated**; past participle: **curated**; gerund or present participle: **curating**

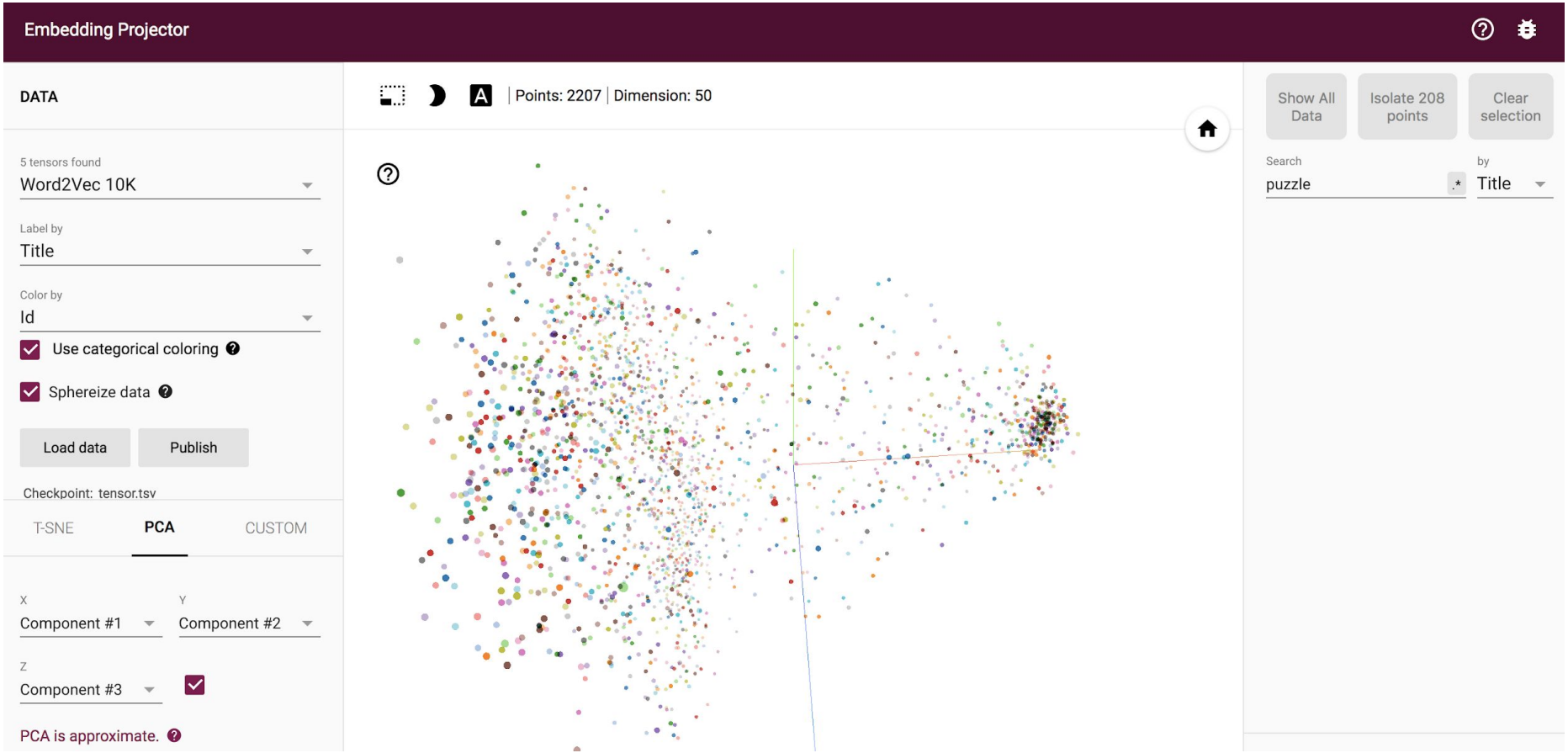
select, organize, and look after the items in (a collection or exhibition).
"both exhibitions are curated by the Centre's director"

- select the performers or performances that will feature in (an arts event or programme).
  "in past years the festival has been curated by the likes of David Bowie"
- select, organize, and present (online content, merchandise, information, etc.), typically using professional or expert knowledge.
  "people not only want to connect when using a network but they also enjoy getting credit for sharing or curating information."

doc2vec


PDE, High Math
Chemical Physics
Material Science
Computer Vision
Computational Physics
Statistics - Machine Learning
CS - AI
History of Math
Philosophy of Physics
Physics Instrumentation
Self Organizing Systems
Quantitative Finance
High Energy Physics
Quantitative Bio - Neurons
Cosmology & Astrophysics

```
train_corpus = list(read_corpus(train_file))
model = gensim.models.doc2vec.Doc2Vec(vector_size=200, min_count=2, epochs=500)
model.build_vocab(train_corpus)
model.train(train_corpus, total_examples=model.corpus_count, epochs=model.epochs)
model.save_word2vec_format(train_dir + '/vectors.w2v', doctag_vec=True, \
  word_vec=False, fvocab='vocab.txt', binary=False)
model.save(train_dir + '/marc.d2v')
```


Embedding Projector
DATA
5 tensors found
Word2Vec 10K
Label by
Title
Color by
Id
Use categorical coloring
Sphereize data
Load data
Publish
Checkpoint: tensor.tsv
T-SNE
PCA
CUSTOM
X
Component #1
Y
Component #2
Z
Component #3
PCA is approximate.
Points: 2207 | Dimension: 50
Show All Data
Isolate 208 points
Clear selection
Search
puzzle
by
Title

Some results...

how singer won the sewing machine war	**0.49**
wikipedia beanie babies	**0.13**
wikipedia monty hall problem	**0.95**
the weird dangerous isolated life of the saturation diver	**0.92**
pets who helped solve their owners murders	**0.54**

Three Phases of Digital Curation

Model Training

- Gather corpus
- Cleanse data
- Train model
- Test model

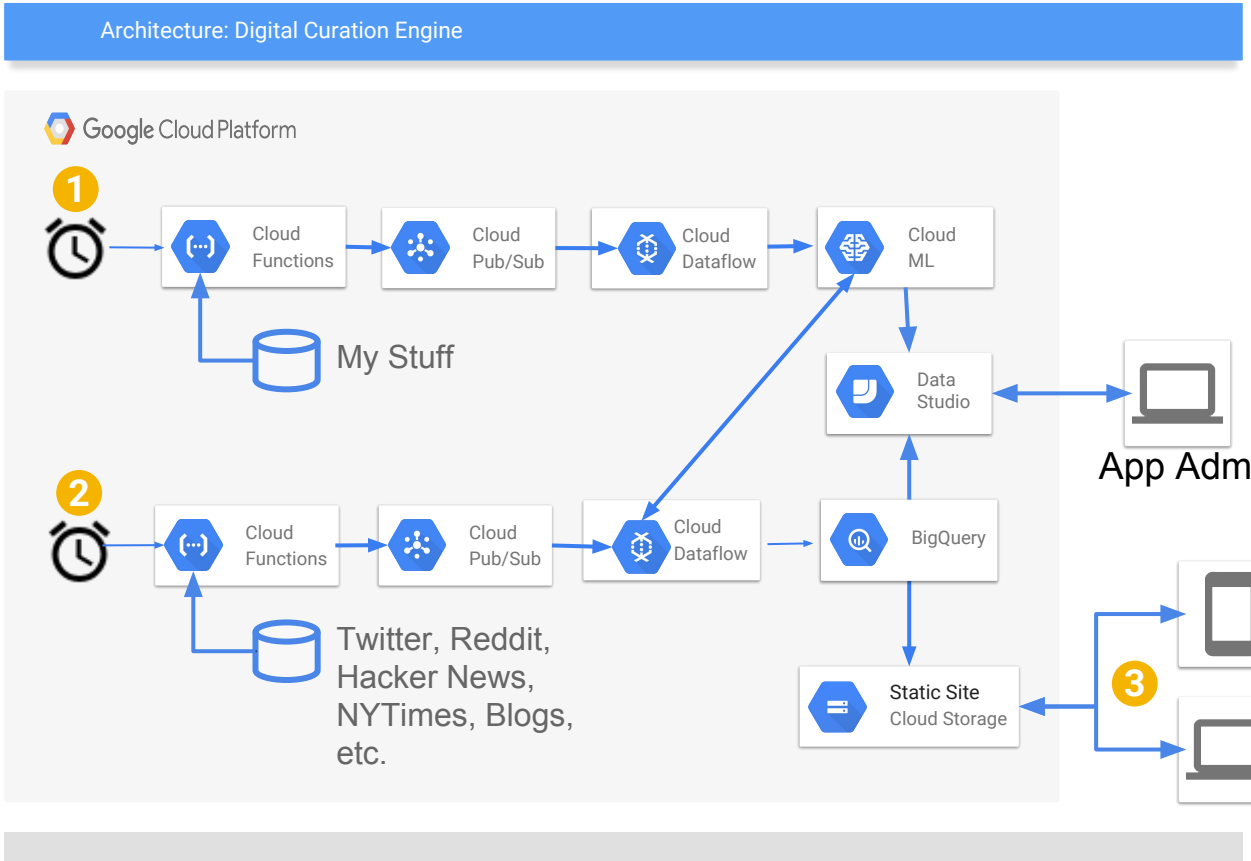
Triage

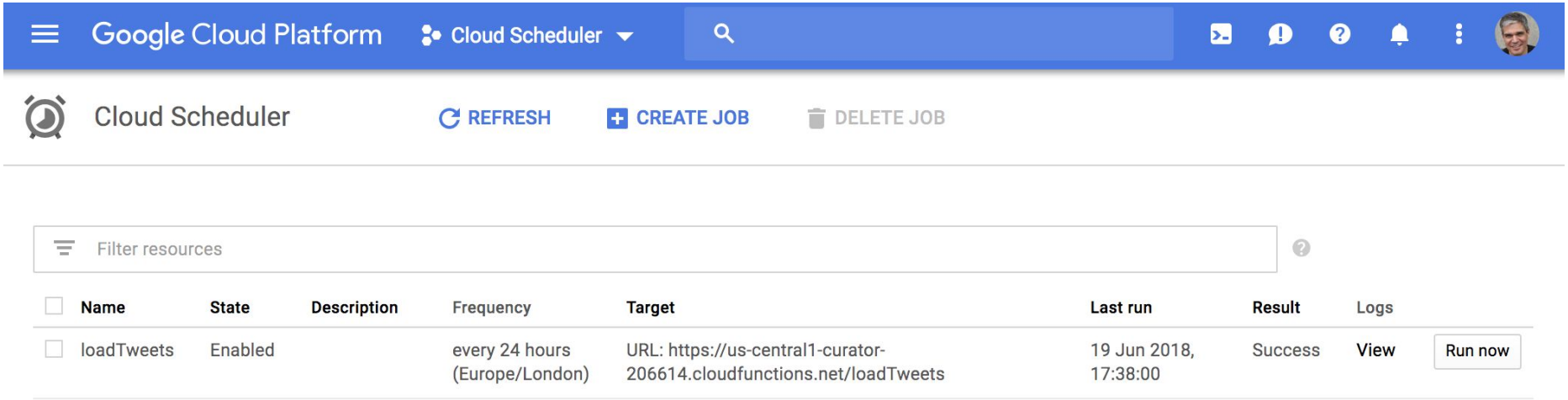
- Regular sampling
- Assess samples
- Save results
- Dashboard

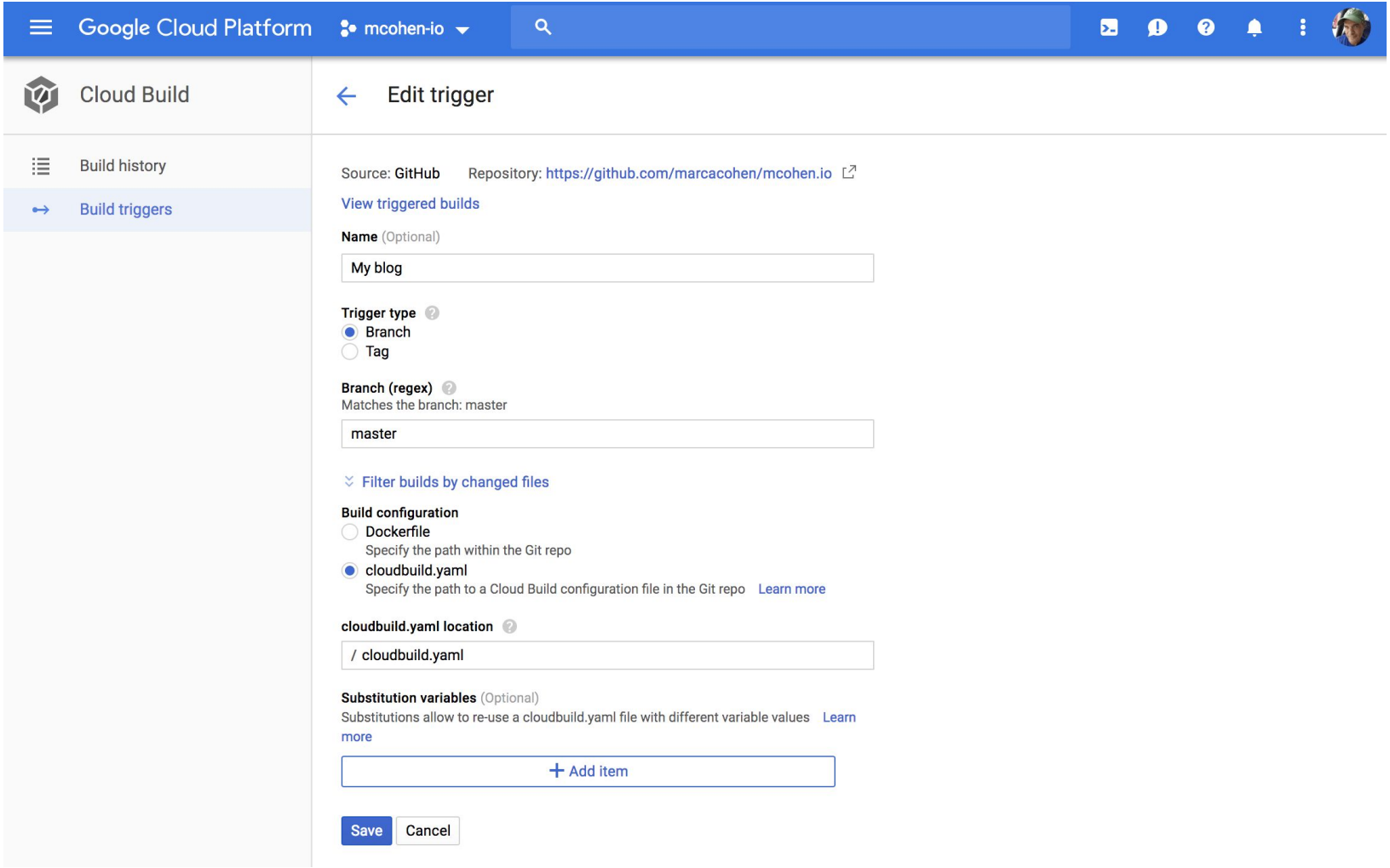
UX

- Chronological list
- Search function
- History+analytics
- Feedback mechanism

1 Model Training
2 Triage
3 User Experience




Google Cloud Platform
Cloud Scheduler
Cloud Scheduler
REFRESH
CREATE JOB
DELETE JOB
Filter resources
Name
State
Description
Frequency
Target
Last run
Result
Logs
loadTweets
Enabled
every 24 hours (Europe/London)
URL: https://us-central1-curator-206614.cloudfunctions.net/loadTweets
19 Jun 2018, 17:38:00
Success
View
Run now


Google Cloud Platform
mcohen-io
Cloud Build
Edit trigger
Build history
Build triggers
Source: GitHub
Repository: https://github.com/marcacohen/mcohen.io
View triggered builds
Name (Optional)
My blog
Trigger type
Branch
Tag
Branch (regex)
Matches the branch: master
master
Filter builds by changed files
Build configuration
Dockerfile
Specify the path within the Git repo
cloudbuild.yaml
Specify the path to a Cloud Build configuration file in the Git repo
Learn more
cloudbuild.yaml location
/ cloudbuild.yaml
Substitution variables (Optional)
Substitutions allow to re-use a cloudbuild.yaml file with different variable values
Learn more
Add item
Save
Cancel

Google Cloud Platform mcohen-io

Cloud Functions | Create function

https://us-central1-mcohen-io.cloudfunctions.net/function-1

Source code

Inline editor

Go 1.11 (Alpha)

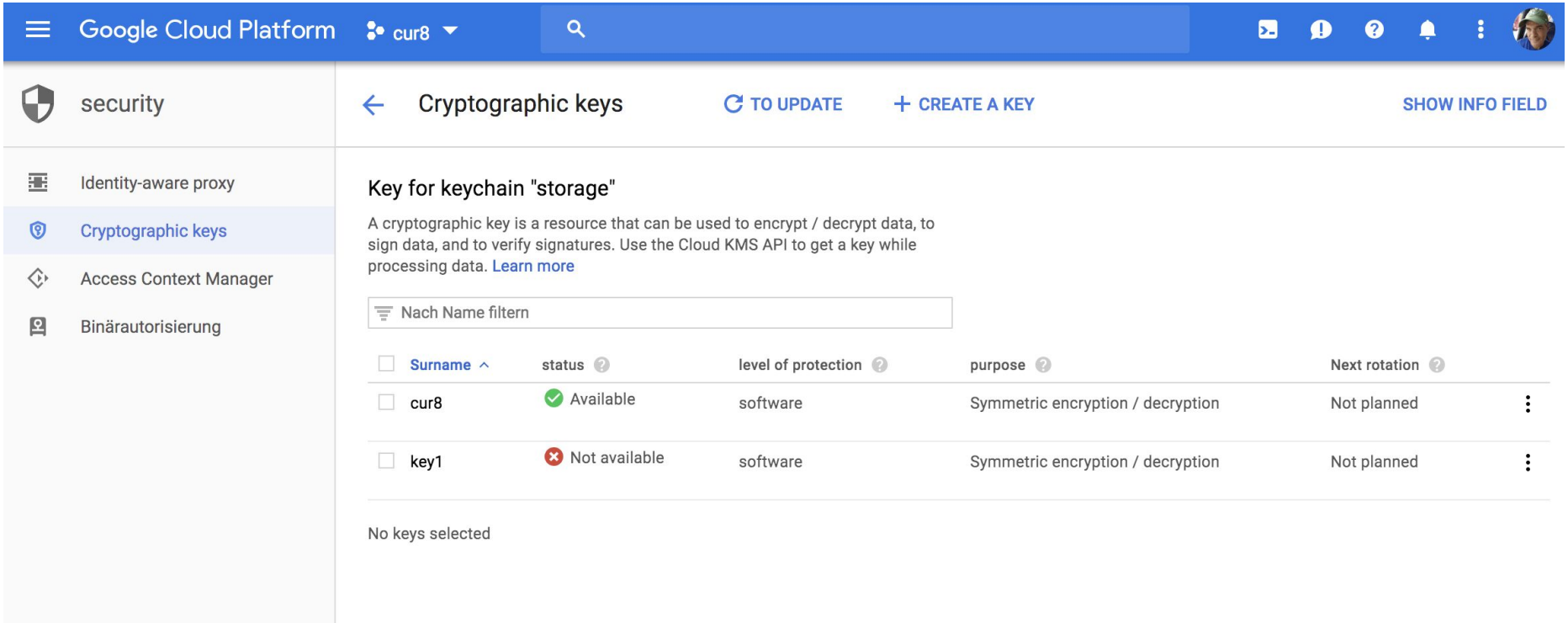
Node.js 6

Node.js 8 (Beta)

Python 3.7 (Beta)

main.py requirements.txt

```
def hello_world(request):
    """Responds to any HTTP request.
    Args:
        request (flask.Request): HTTP request object.
    Returns:
        The response text or any set of values that can be
        Response object using
        `make_response <http://flask.pocoo.org/docs/0.12/ap
    """
    request_json = request.get_json()
    if request.args and 'message' in request.args:
        return request.args.get('message')
    elif request_json and 'message' in request_json:
        return request_json['message']
    else:
        return f'Hello World!'
```


Google Cloud Platform
cur8
security
Identity-aware proxy
Cryptographic keys
Access Context Manager
Binärautorisierung
Cryptographic keys
TO UPDATE
CREATE A KEY
SHOW INFO FIELD
Key for keychain "storage"
A cryptographic key is a resource that can be used to encrypt / decrypt data, to sign data, and to verify signatures. Use the Cloud KMS API to get a key while processing data. Learn more
Nach Name filtern
Surname
status
level of protection
purpose
Next rotation
cur8
Available
software
Symmetric encryption / decryption
Not planned
key1
Not available
software
Symmetric encryption / decryption
Not planned
No keys selected

Superpowered Learning

Hello, Colaboratory

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- Getting Started
- Highlighted Features
  - TensorFlow execution
  - GitHub
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    - Examples
  - Local runtime support

SECTION

Welcome to Colaboratory!

Colaboratory is a free Jupyter notebook environment that requires no setup and runs entirely in the cloud. See our FAQ for more info.

Getting Started

- Overview of Colaboratory
- Loading and saving data: Local files, Drive, Sheets, Google Cloud Storage
- Importing libraries and installing dependencies
- Using Google Cloud BigQuery
- Forms, Charts, Markdown, & Widgets
- TensorFlow with GPU
- TensorFlow with TPU
- Machine Learning Crash Course: Intro to Pandas & First Steps with TensorFlow
- Using Colab with GitHub

Highlighted Features

Seedbank

Looking for Colab notebooks to learn from? Check out Seedbank, a place to discover interactive machine learning examples.

Hello, TPU in Colab

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Testing out the TPU connection

First, you'll need to enable TPUs for the notebook.

Navigate to Edit→Notebook Settings, and select TPU from the Hardware Accelerator drop-down (you can also access Notebook Settings via the command palette: cmd/ctrl-shift-P).

Next, we'll check that we can connect to the TPU.

[1]
```
import os
import pprint
import tensorflow as tf

if 'COLAB_TPU_ADDR' not in os.environ:
  print('ERROR: Not connected to a TPU runtime; please see the first cell in this notebook for instructions!')
else:
  tpu_address = 'grpc://' + os.environ['COLAB_TPU_ADDR']
  print ('TPU address is', tpu_address)

  with tf.Session(tpu_address) as session:
    devices = session.list_devices()

  print('TPU devices:')
  pprint.pprint(devices)
```

```
TPU address is grpc://10.4.220.34:8470
TPU devices:
[_DeviceAttributes(/job:tpu_worker/replica:0/task:0/device:CPU:0, CPU, -1, 12857156263210199625),
 _DeviceAttributes(/job:tpu_worker/replica:0/task:0/device:XLA_CPU:0, XLA_CPU, 17179869184, 15227990594443770068),
 _DeviceAttributes(/job:tpu_worker/replica:0/task:0/device:XLA_GPU:0, XLA_GPU, 17179869184, 6960509336819419478),
 _DeviceAttributes(/job:tpu_worker/replica:0/task:0/device:TPU:0, TPU, 17179869184, 725889995631097262),
 _DeviceAttributes(/job:tpu_worker/replica:0/task:0/device:TPU:1, TPU, 17179869184, 7406319308873999103),
```

Collection of Interactive Machine Learning Examples

We call them "seeds". Each seed is a machine learning example you can start playing with. Explore, learn and grow them into whatever you like.

No Setup required

Run and experiment with machine learning code in your browser.

Free GPU Backend

Run and train models, plot results real-time, share with others.

Explore and Learn

Discover new algorithms, extend them to suit your ideas.

Performance RNN.ipynb

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Performance RNN

Environment Setup

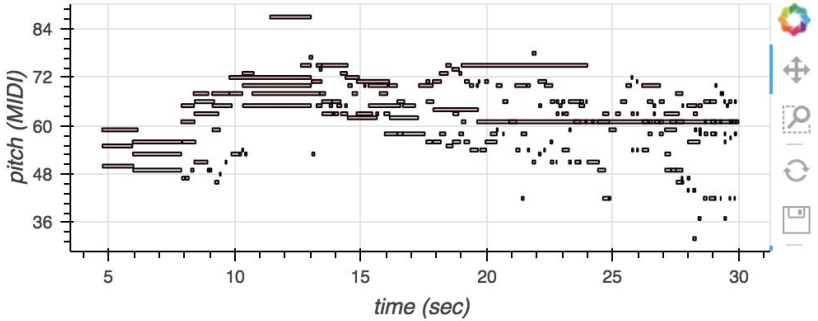
Generate a sequence

SECTION

```
sf2_path='/tmp/Yamaha-C5-Salamander-JNv5.1.sf2')
```

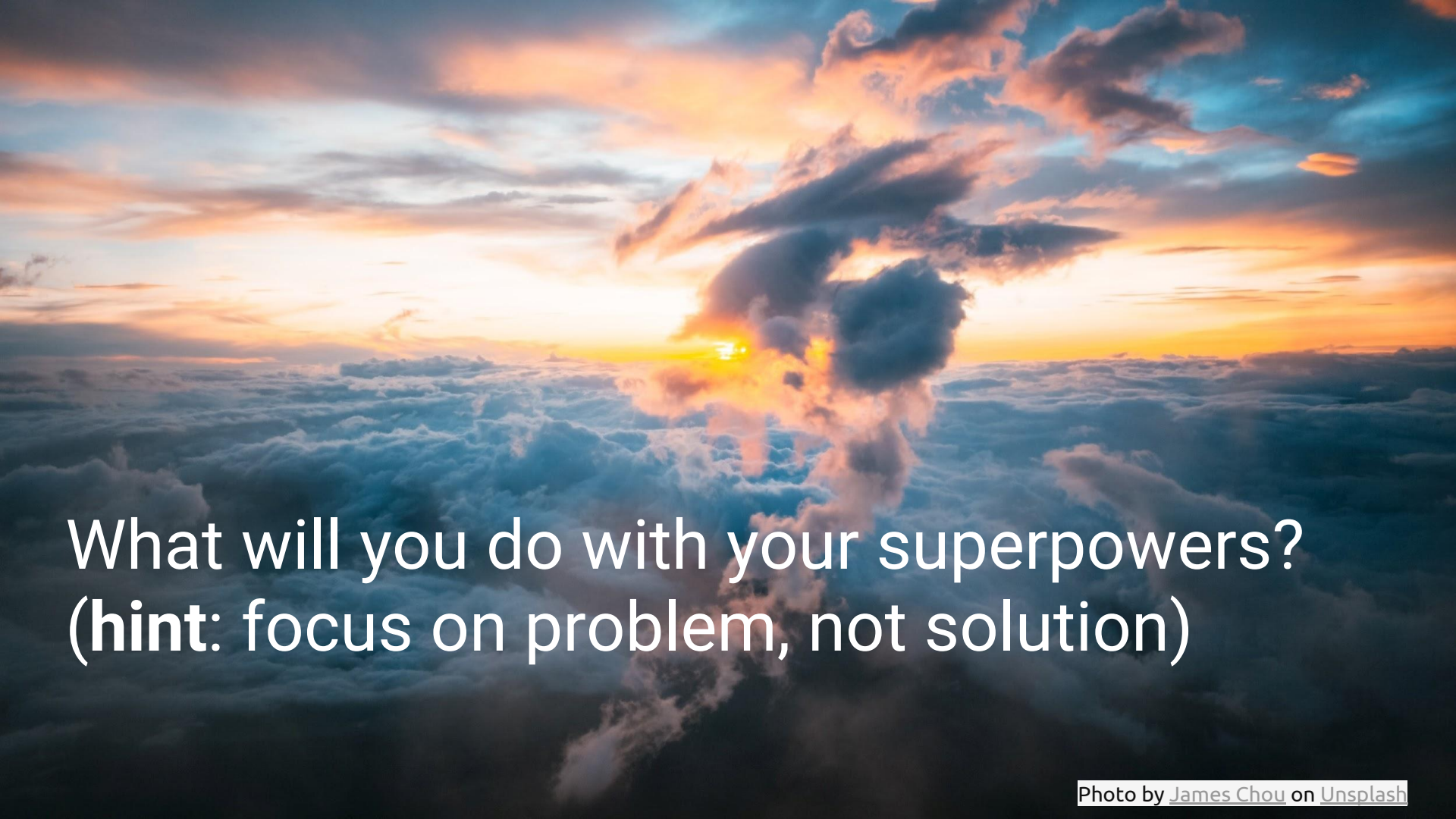
```
WARNING:tensorflow:The saved meta_graph is possibly from an older release:
'model_variables' collection should be of type 'byte_list', but instead is of type
INFO:tensorflow:Restoring parameters from /tmp/tmpT9wO1o/model.ckpt
INFO:tensorflow:Need to generate 2899 more steps for this sequence, will try asking
INFO:tensorflow:Beam search yields sequence with log-likelihood: -3775.444336
```

BokehJS 1.0.0 successfully loaded.



0:31 / 0:31

AMLD2018 - AI Music Generation Challenge


What will you do with your superpowers?
(**hint**: focus on problem, not solution)
Photo by James Chou on Unsplash

Thanks!

Marc Cohen
mco@google.com
@marcacohen
mcohen.io

bit.ly/mco-superpowers