

THE ABC OF DIGITAL COMPETENCY: A LAYMAN'S GUIDE TO AI, BIG DATA AND CLOUD COMPUTING

Bernard Suen
Center for Entrepreneurship
Chinese University of Hong Kong

Our Agenda Today

- ✓ **Cloud computing** as a **service**.
- ✓ **Big data** is a “**platform**” game.
- ✓ Machine Learning: **Artificial Intelligence** for **mass adoption**.
- ✓ From ABC to ABCD

McKinsey
& Company



Workshops and Hackathon: From Data Sourcing to Web Publishing Series 2020/21

Date: 01/02/2021 to 23/05/2021

We are pleased to offer the following workshops on the theme “From Data Sourcing to Web Publishing” from February to April and a hackathon in May 2021. All CUHK students and staff are welcome to join.

- Workshops
- Hackathon

Co-organizers: Center for Entrepreneurship, CUHK Library, Data Science and Policy Studies Programme, Department of Cultural and Religious Studies, Department of Management, Department of Social Work, Entrepreneurship and Innovation Minor Programme, School of Journalism and Communication of CUHK

Workshops

The workshops are classified in five categories:

1. Problem Definition
2. Data Preparation
3. Analysis/Modeling/Validation
4. Presentation/Visualization/Storytelling
5. Deployment

Hackathon

Main Theme: Post-COVID-19 Opportunities: What People want to Do After the Pandemic

Tentative Date: 21 (Fri) – 23 (Sun) May 2021

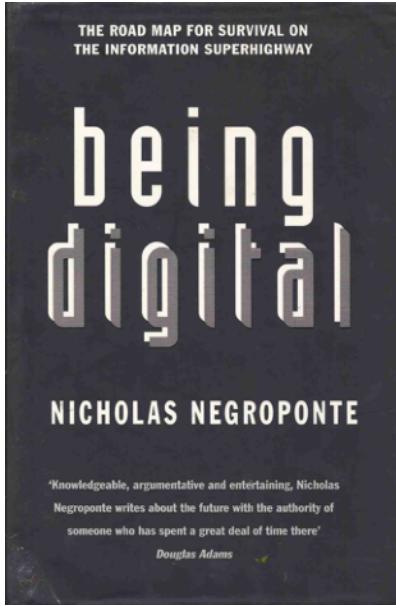
Aims:

- Promoting innovation skills, including data and digital competency, to CUHK students and staff
- Enhancing multi-disciplinary and multi-dimensional collaboration among CUHK students and staff

Description:

- Within 48 hours, participants will apply knowledge and skills from what they have learnt in the pre-hackathon workshops about data mining to solve the current problem in the Post-COVID-19 era. Participants shall select one sub-theme among four and work as a one group to provide a solution in an innovative way. Participants will have a group presentation of their solutions in Day 3.
- The winning presentations will be selected with awards.

Eligibility: CUHK students, 3 to 5 persons per group from 2 different Faculty groups



By Nicholas Negroponte, 1995

- ✓ **What skills do 21st century talents need?**
- ✓ **Is being digital the only way to go?**
- ✓ **How should we then live?**



**Do you still remember the days when
you had to install software on your
computer through CD-ROM?**

The image displays four overlapping web application windows:

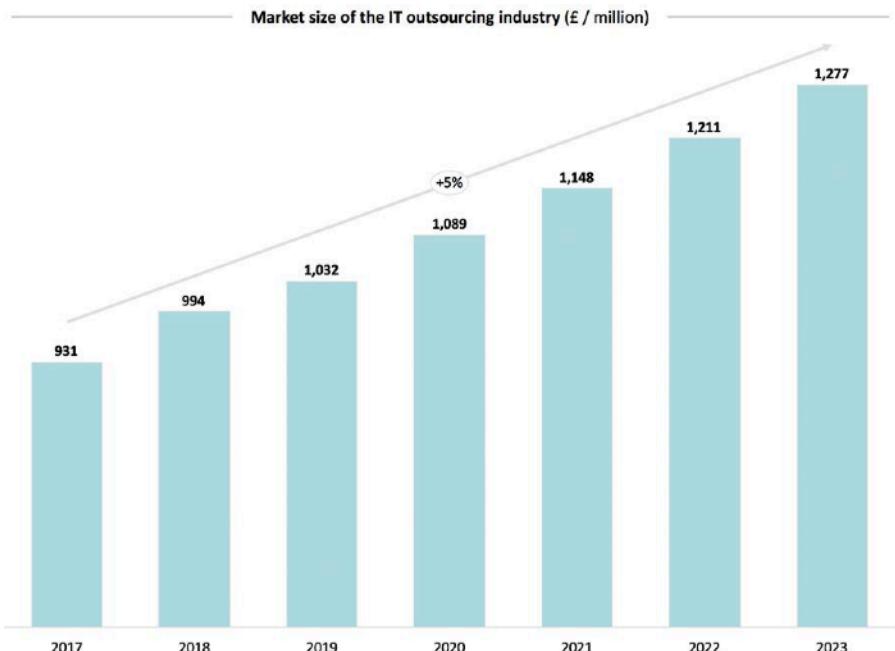
- Microsoft Office 365:** Shows the "Office apps & devices" section with links to Outlook, OneDrive, Word, Excel, PowerPoint, OneNote, SharePoint, Teams, Class Notebook, Sway, Delve, Whiteboard, and Azure Notebooks.
- Adobe Account:** Shows the "Welcome to your account, Ys" screen with a "Add a backup email address" button.
- Zoom:** Shows the "Meetings" section with tabs for "Upcoming", "Previous", "Personal Room", and "Meeting Templates". It lists two recurring meetings: "COM5940 Class Meeting" and "MGNT3070".
- Generic Document Viewer:** Shows a preview of a document with a colorful, abstract circular graphic.

Text Overlay:

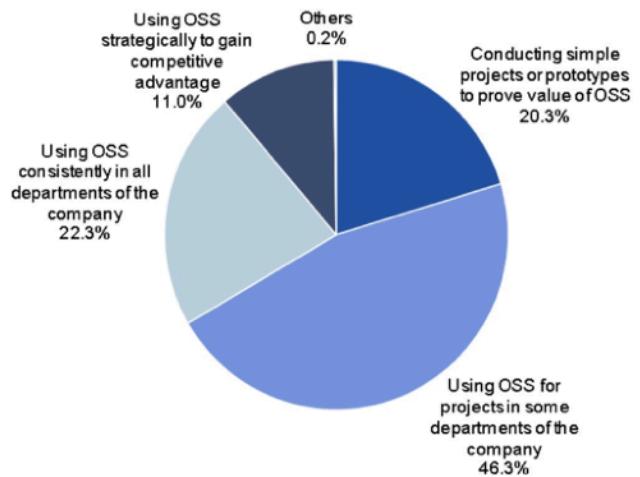
Today, most software are offered as cloud based services.



In the last 25 years, the rise of the web, mobile internet, social media, e-commerce, and IoT has placed tremendous demand on data centre services. The continuous digital transformation and outbreak of COVID19 have accelerated the trend.



Source: Gartner 2017



Source: Gartner 2011

OSS = Open-source software

IT outsourcing has continued to increase as hardware becomes more commoditised and software becomes more open and free. The real money to be made has shifted to services.

Amazon and AWS: the dawn of cloud services.

Others joining the game.

IBM



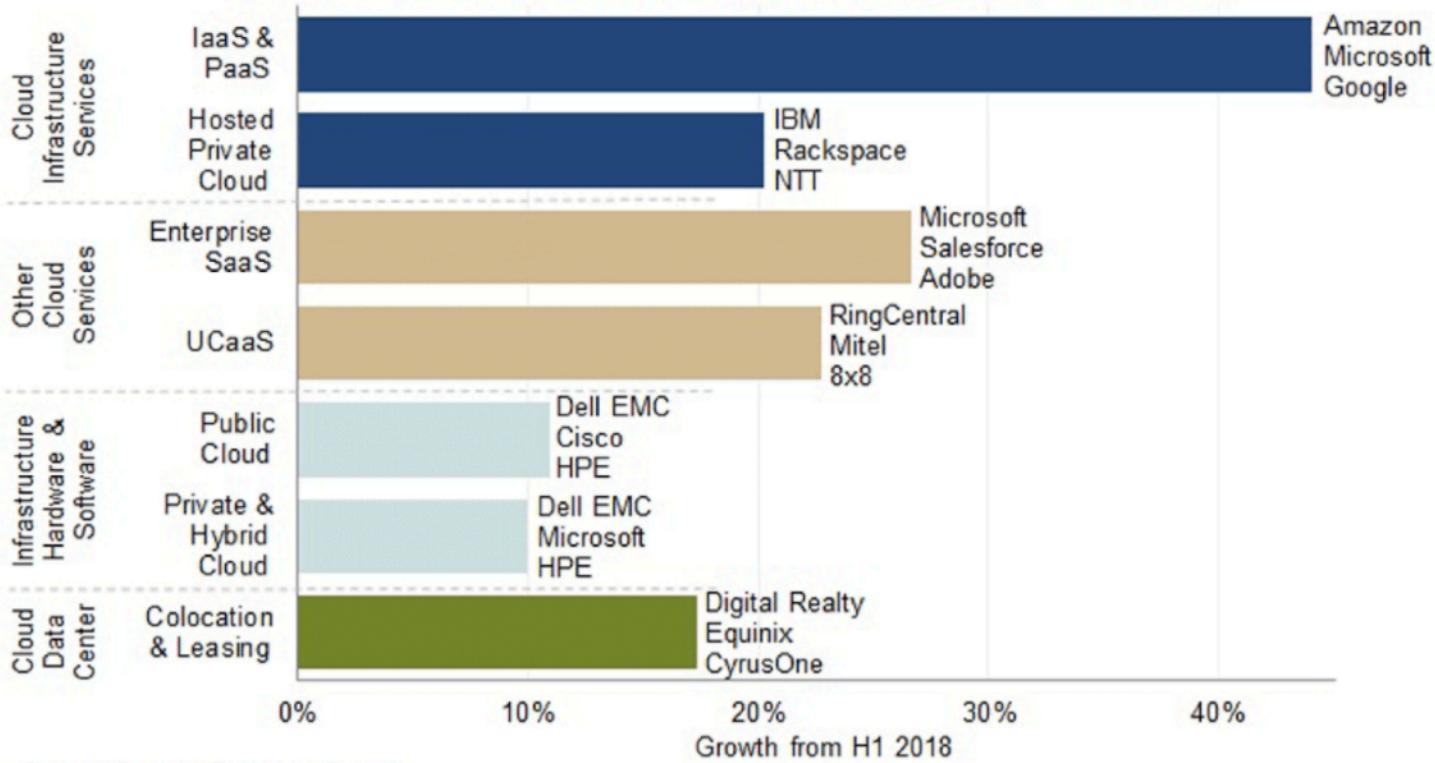
Worldwide cloud infrastructure spending and annual growth
Canalys estimates, Q4 2019

Cloud service provider	Q4 2019 (US\$ billion)	Q4 2019 market share	Q4 2018 (US\$ billion)	Q4 2018 market share	Annual growth
AWS	9.8	32.4%	7.3	33.4%	33.2%
Microsoft Azure	5.3	17.6%	3.3	14.9%	62.3%
Google Cloud	1.8	6.0%	1.1	4.9%	67.6%
Alibaba Cloud	1.6	5.4%	1.0	4.4%	71.1%
Others	11.6	38.5%	9.3	42.4%	24.4%
Total	30.2	100.0%	22.0	100.0%	37.2%



Note: percentages may not add up to 100% due to rounding
Source: Canalys Cloud Channels Analysis, January 2019

Cloud Market Growth & Segment Leaders - H1 2019



Source: Synergy Research Group

— Cloud market growth and segment leaders (Image source: Synergy.com)

What is cloud computing anyway?

The Cloud Stack

- Google Map, Gmail, Uber, Airbnb
- Office 365, Adobe Cloud
- Zoom, WeChat Mini Program, PayPal, AliPay

SaaS (software as a Service)

- OS, database server, lang runtime
- Back-end development tools and frameworks, web/app server
- Other AI/Big data, IOT, streaming support

PaaS (Platform as a Service)

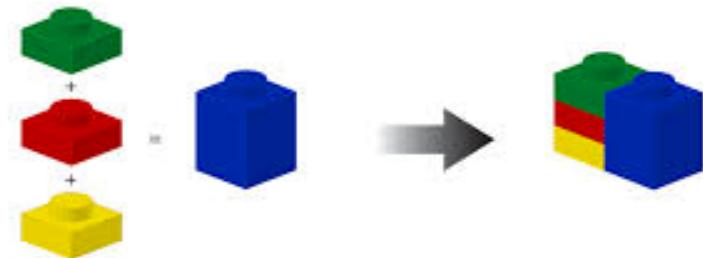
- Virtual machine, hardware servers
- Load balancing, networking, storage, routers, security, 7/24 uninterrupted power supply

IaaS (Infrastructure as a Service)

Private Cloud / Hybrid Cloud / Public Cloud

Componentization and Connectivity:

The forces behind the rapid development of hardware and software businesses in the IT industry.



****Moorse's Law and Metcalfe's Law**

Moore's law

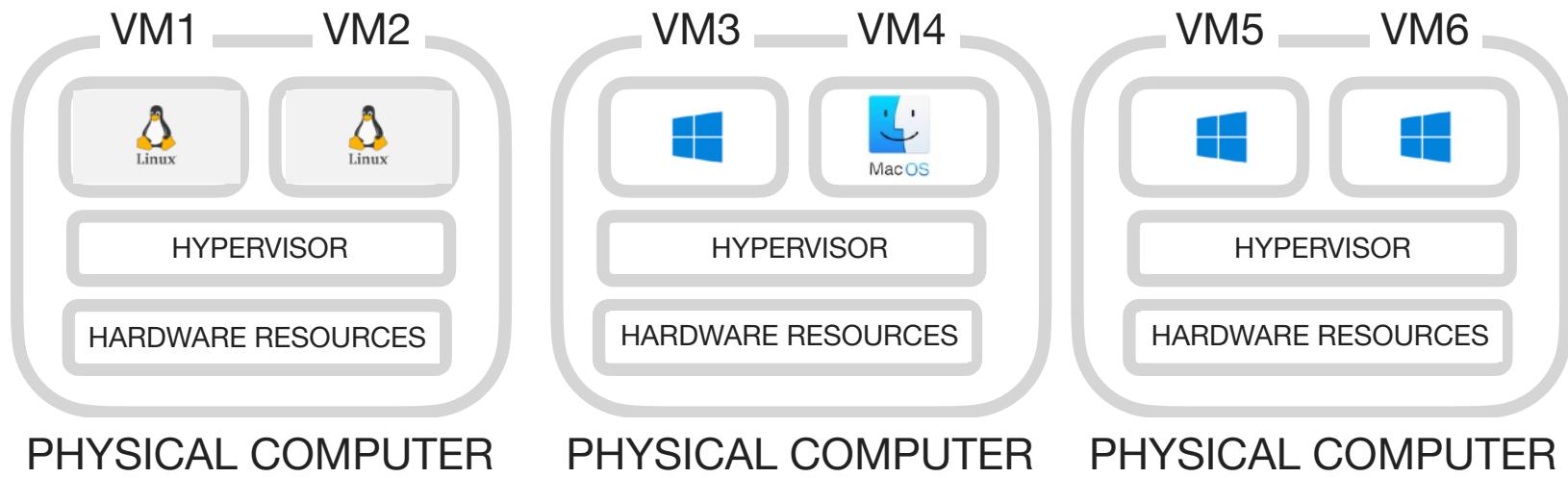
Moore's law is the observation that the number of transistors in a dense integrated circuit doubles about every two years. Moore's law is an observation and projection of a historical trend. Rather than a law of physics, it is an empirical relationship linked to gains from experience in production. [Wikipedia](#)

Metcalfe's law

Metcalfe's law states that the value of a telecommunications network is proportional to the square of the number of connected users of the system. [Wikipedia](#)

**Maturing virtualisation technology
(virtualisation of computing and networking)
also plays an important part.**

Demonstration of a virtual machine (VM).



Popular Hypervisor programs: IBM KVM, VMWare, Oracle VirtualBox

**Virtualization of servers to
virtualisation of networks.**



Virtualization allows more flexible services to be migrated to the cloud.

Difference between IaaS, PaaS and SaaS

On-Premises	IaaS	PaaS	SaaS
Applications	Applications	Applications	Applications
Data	Data	Data	Data
Runtime	Runtime	Runtime	Runtime
Middleware	Middleware	Middleware	Middleware
O/S	O/S	O/S	O/S
Virtualization	Virtualization	Virtualization	Virtualization
Servers	Servers	Servers	Servers
Storage	Storage	Storage	Storage
Networking	Networking	Networking	Networking

Source: SimplyLearn

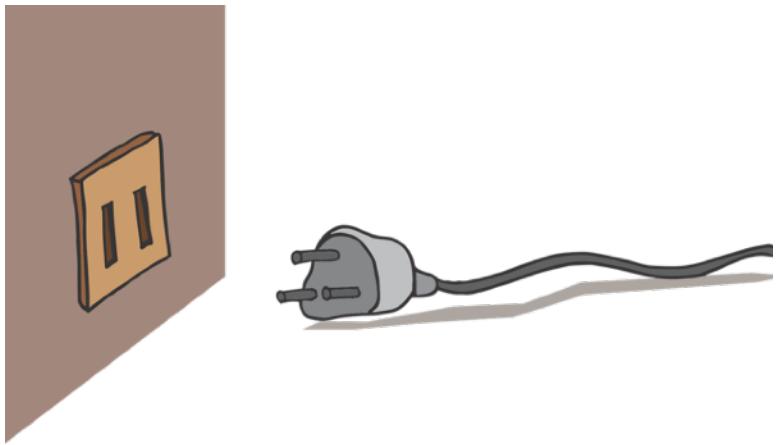
Managed by you

Managed by Vendor

“X” as a Service

“Everything as a Service” Business Model

https://www.youtube.com/watch?v=A4w2qHCWc0c&feature=emb_logo



**Cloud computing is
essentially based on the
utility model.**

Cloud computing has lowered the entry barrier for becoming an IT startup. But that is not enough for spurring the growth of the field, especially during 2008 when the entire world was hit by the global financial crisis. Nonetheless...

2008 Global Financial Crisis

Source: Oliver Wyman



Victims of the crisis?

Source: Wikipedia

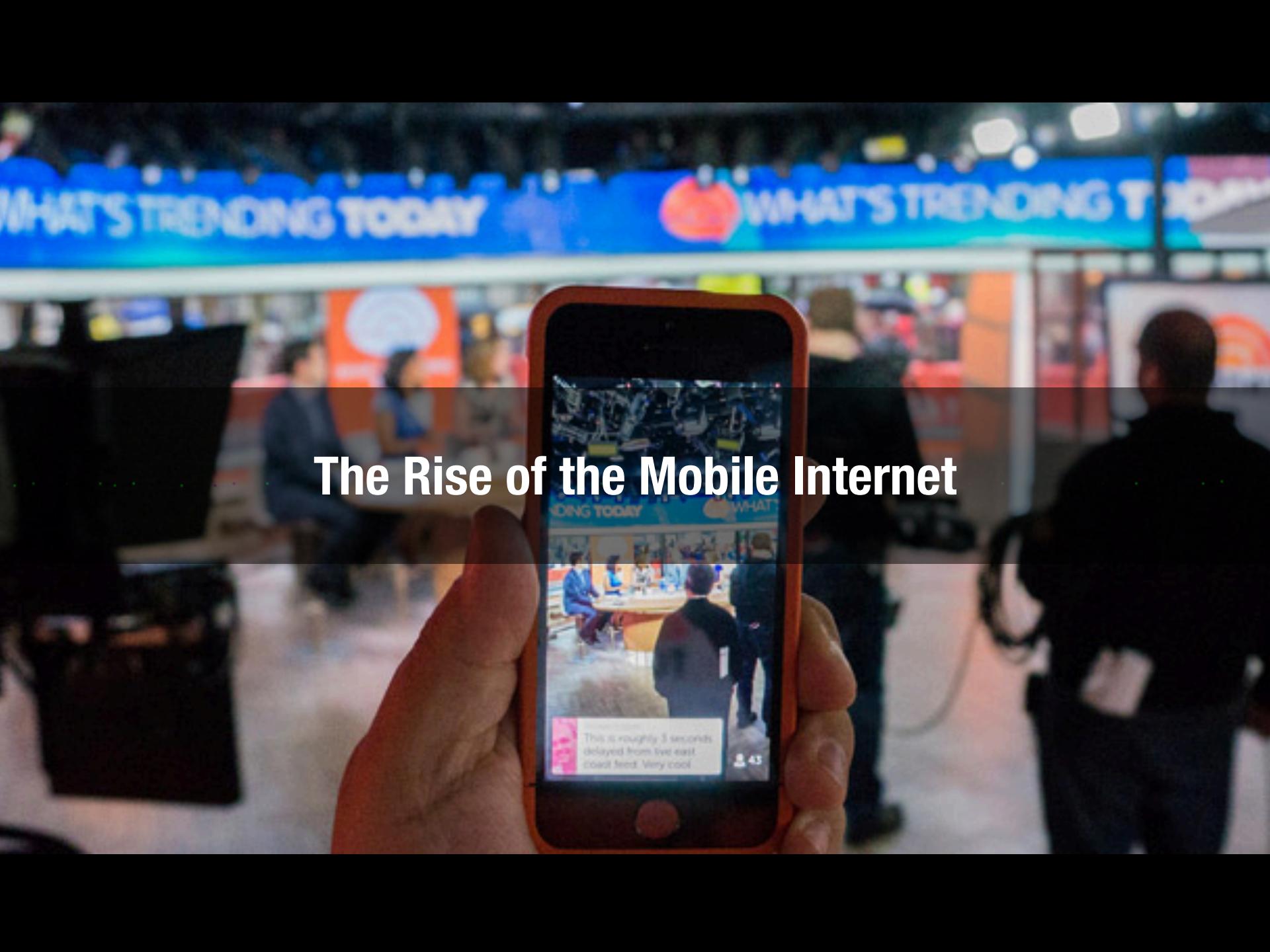
Source: Junpei Abe (Flickr)



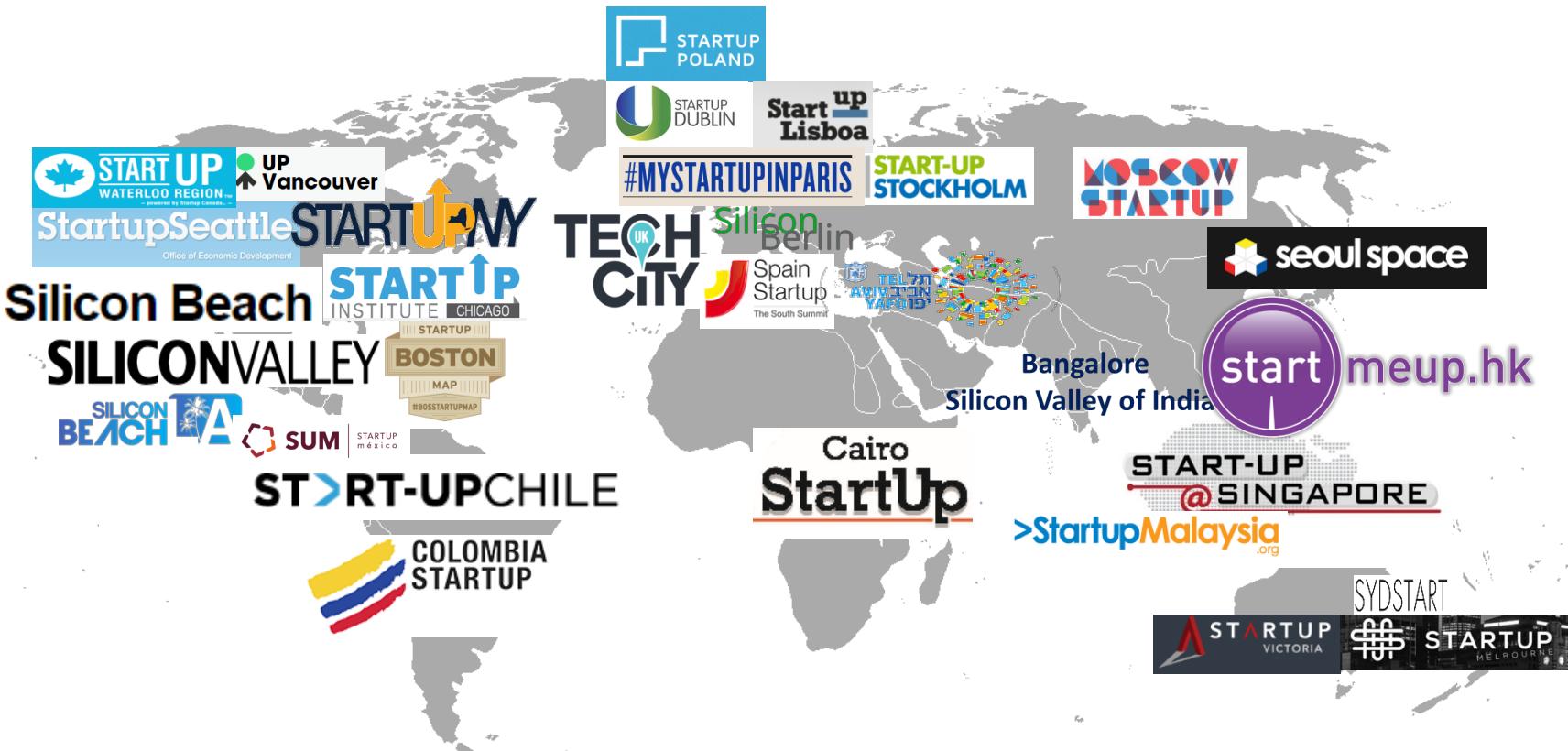
Financial Crisis - Wikipedia, the free encyclopedia



The Rise of the Mobile Internet



The rise of the global startup movement.





Hong Kong, Co-Working Spaces • February 15, 2018

4 Cats Co-Business Community



Hong Kong, Co-Working Spaces • February 14, 2018

Andotherspace



Hong Kong, Co-Working Spaces • February 13, 2018

Arco City



Hong Kong, Co-Working Spaces • February 12, 2018

BLOOM



Hong Kong, Co-Working Spaces • February 11, 2018

blueprint



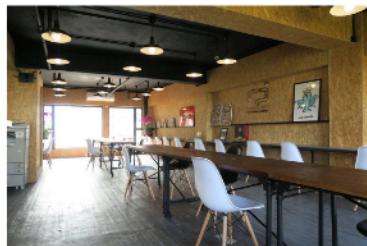
Hong Kong, Co-Working Spaces • February 10, 2018

CO:WORK SOLO



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Campfire



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Central Park



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CoCoon



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Coffee



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Cowork CHM



Hong Kong, Co-Working Spaces • February 4, 2018

Cyberport Smart Spaces

Source: Jumstart Magazine

**Tech giants becoming the
new monopolies**



Tencent 腾讯

Baidu 百度



Microsoft

Alphabet

amazon





NETFLIX



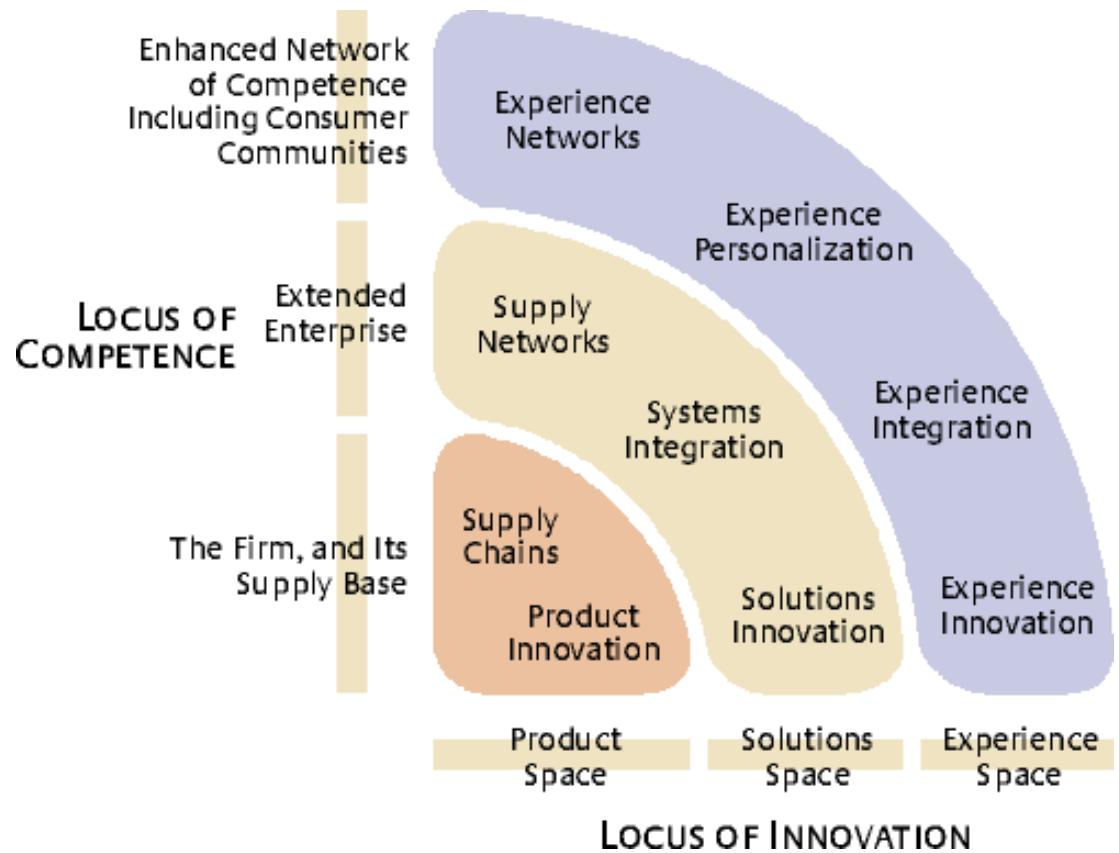
Industry innovation and disruption comes from digital and technology platforms



Who rules the platform will rule the world.

What is a platform?

1. An **eco-system** for linking new users, customers, business partners, vendors, and complementars to create values.
2. Extend the traditional supply chain beyond vendors, distributors, and retailers to social media channels and other online and off-line communities to form a tightly knitted **network** of stakeholders who agree to a common protocol for **value exchange, resulting in network effect**.
3. The common protocol for value exchange enforces **common standards** for data exchange which is called **API**.



Source: C.K. Prahalad and Venkatram Ramaswamy, The New Frontier of Experience Innovation, MIT Sloan Review, Summer 2003



Google Cloud Platform



Prediction API



Natural Language
API



Translation API



Vision API



PayMe Marketplace API
PayMe • paymeapi

Documentation

Inspector



PayMe Marketplace API

Download
API Blueprint

INTRODUCTION

API Capabilities and Structure

Getting Started and Connection Details

Service URLs

Credit Card Numbers for Testing Purposes

INTRODUCTION

Our API is designed to allow platforms to offer a full payment solution as part of their product.

Using the API you can:



微信支付
WeChat Pay

Home

Documents

WeChat payment API development documents, [Chinese](#)



Quick Pay

Buyers can present the pay code, vendor will scan the code to finish the transaction.



Alibaba Open Platform

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Resources

Platform

▶ Tmall.hk

API for Alibaba

Sourcing API : [Click here](#)

WholeSale API:[Click here](#)

GROWTH STRATEGY

The Strategic Value of APIs

by Bala Iyer and Mohan Subramaniam

JANUARY 07, 2015

McKinsey&Company
Digital McKinsey

How We Help Clients Our Insights Careers Our People Contact Us

Article
October 2017

Management's next frontier: Making the most of the ecosystem economy

By Jürgen Metzert and Anand Swaminathan

API經濟來了：從開放創新到Open API

by



《數位時代》整合行銷部

2014.11.04



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Article
September 2017

What it really takes to capture the value of APIs

☰ Deloitte.
Insights

Article

API economy

From systems to business services



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IBM Institute for Business

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Realizing the economic value of APIs

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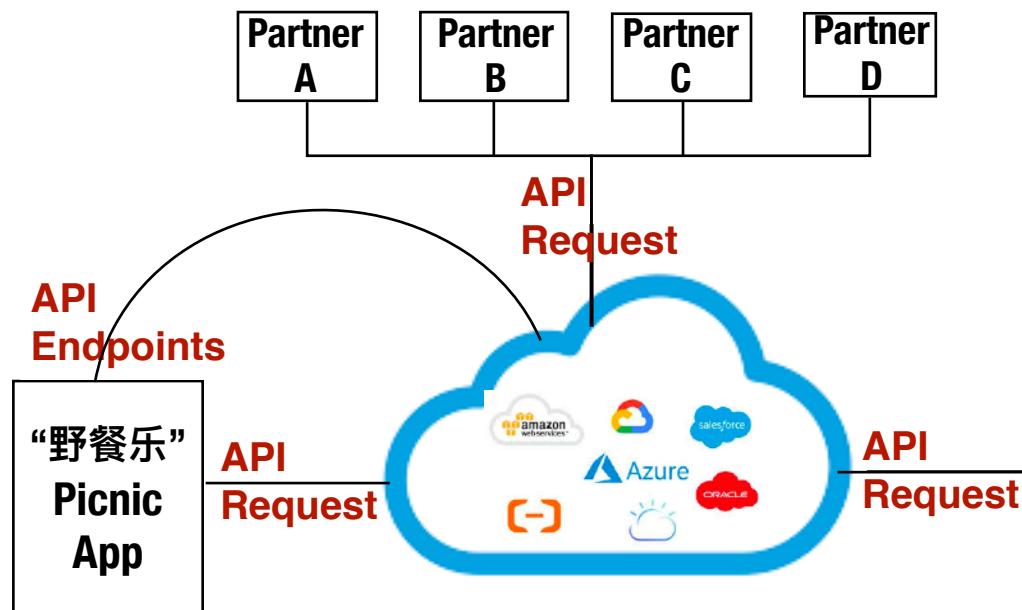
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To Be or Not To Be

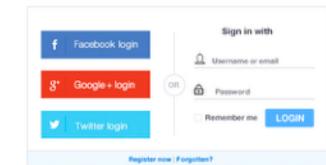
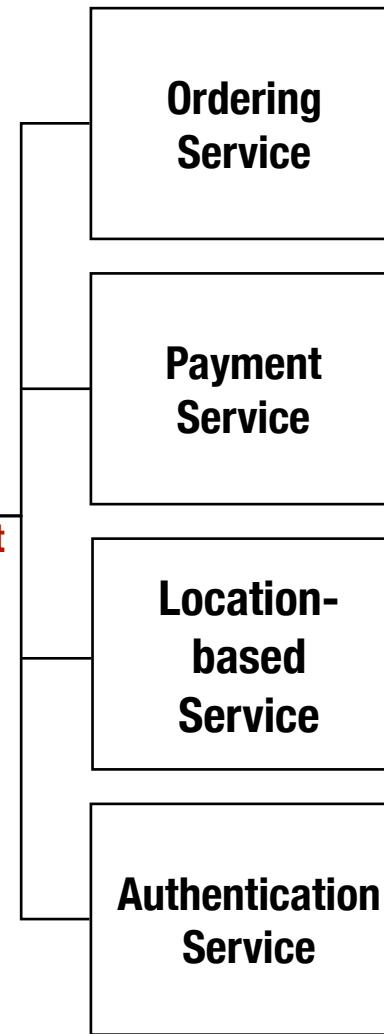
生存還是毀滅，這是你面對的一個問題

Business partners requesting your services through API requests.



Micro-services formed the foundation for providing features needed by the application to serve the ultimate users/customers

Micro-services



Implications for future product and business development.

1. Which product features should be implemented internally and which should be provided externally through API micro-service providers?
2. Should one also provide API-based micro-services to one's business partners?
3. What data and functionalities should be opened to external parties?
4. How does the API features being considered together with one's cloud and overall product/platform strategies?



Windows

intel.[®]



iOS

Source: wikipedia.org

Digital platforms are crossing industry boundaries to disrupt incumbents.



Synced

AI TECHNOLOGY & INDUSTRY REVIEW

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TECHNOLOGY

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AI CHINA INDUSTRY UNITED STATES

Amazon Go vs Alibaba Tao Cafe: Staffless Shop Showdown

Amazon and Alibaba's brick-and-mortar-but-no-staff shops offer very different user experiences. To bring you first-hand feedback, Synced visited them.

Source: The Synced, Jan 22, 2018



Chinese Internet Giant Tencent Invests \$70 Million In Healthcare Group DXY

Catherine Shu @catherineshu / Sep 2, 2014

Comment



Source: Tech Crunch, Sep 2, 2014

The New York Times

Amazon Wants to Disrupt Health Care in America. In China, Tech Giants Already Have.

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By SUI-LEE WEE and PAUL MOZUR JAN. 31, 2018



Source: The New York Times, Jan 31, 2018

Winners take all? Almost.

China vs. US – Top Players for Key Verticals

IN CHINA

Baidu

Tencent

JD.com

SEARCH + SHOPPING

Google

Amazon

eBay

IN US

RISE



China vs. US – Top Players for Key Verticals



Source: China Internet Report 2018

Huawei signals global 5G network leadership intentions



TOM BALL REPORTER

23RD FEBRUARY 2018

+ INCREASE / DECREASE TEXT SIZE -



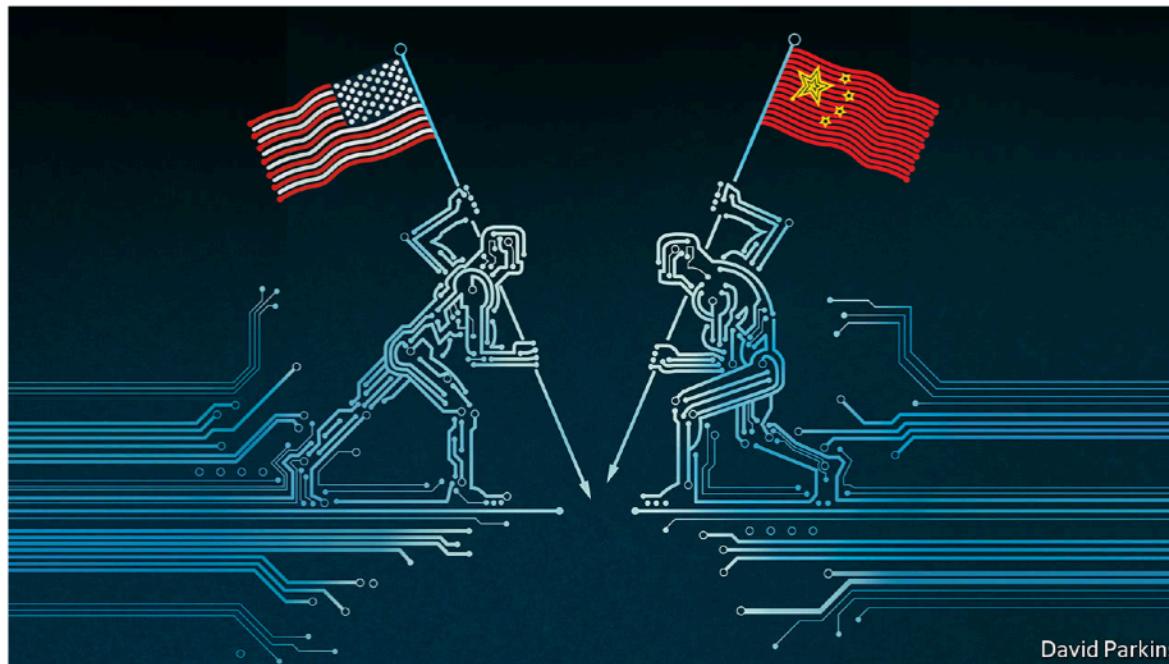
**HUAWEI AIMING TO
BECOME THE
PLATFORM CHOICE
FOR SETTING
5G STANDARDS**

Source: Computer Business Review Feb 2018

America v China

The battle for digital supremacy

America's technological hegemony is under threat from China



More than a trade war.

**Technology lead drives
national power.**

**How do traditional companies
respond to the challenges ?**



b2b tech accelerator

Swire Properties has introduced an accelerator that's taking Hong Kong by storm.



INFINITI LAB

MEET OUR STARTUPS

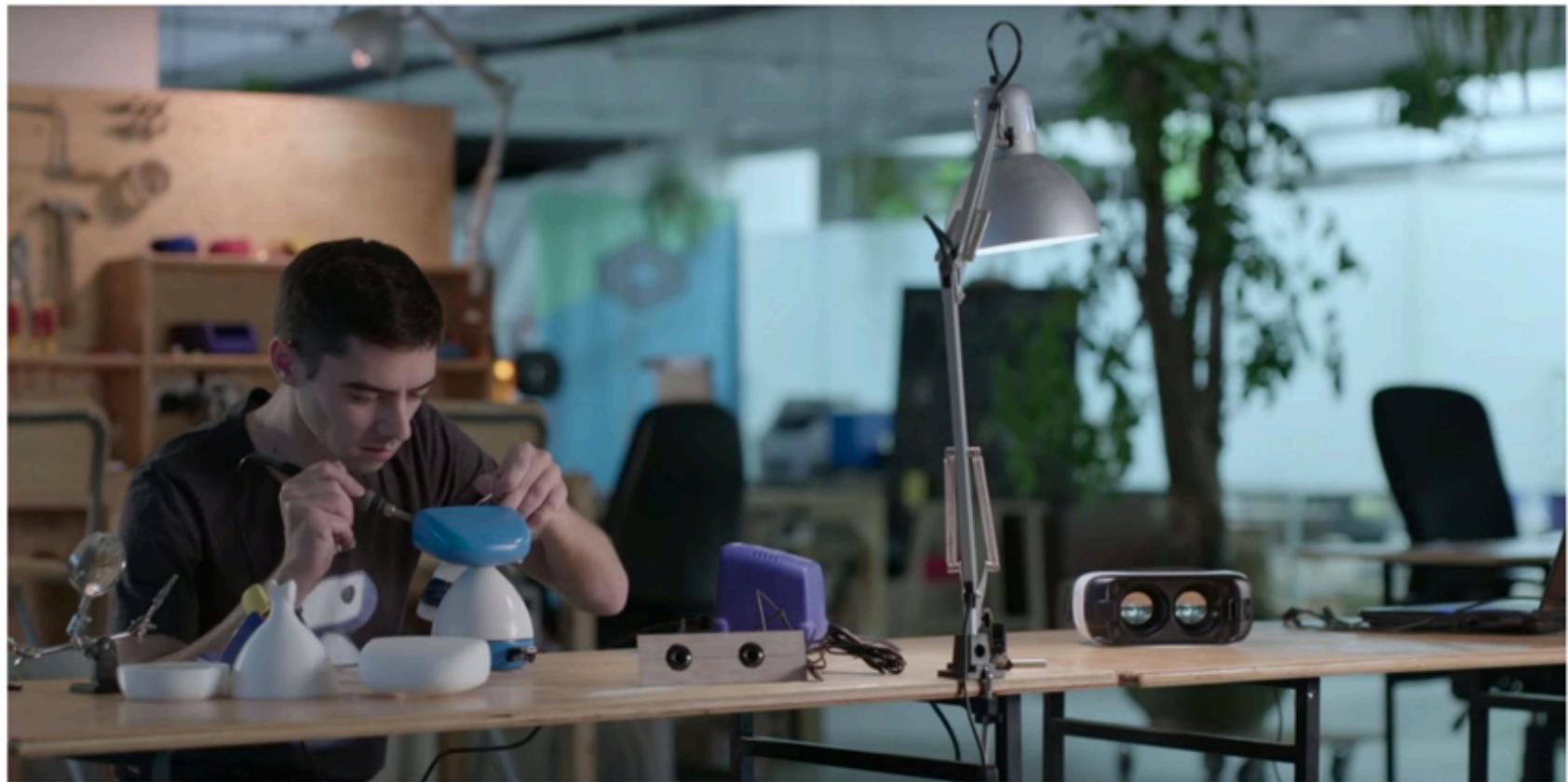
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the
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THE LANE CRAWFORD JOYCE GROUP

The Cage is a 12-week development programme, powered by The Lane Crawford Joyce Group, which offers intensive mentorship to start-ups building retail-relevant technologies and/or services



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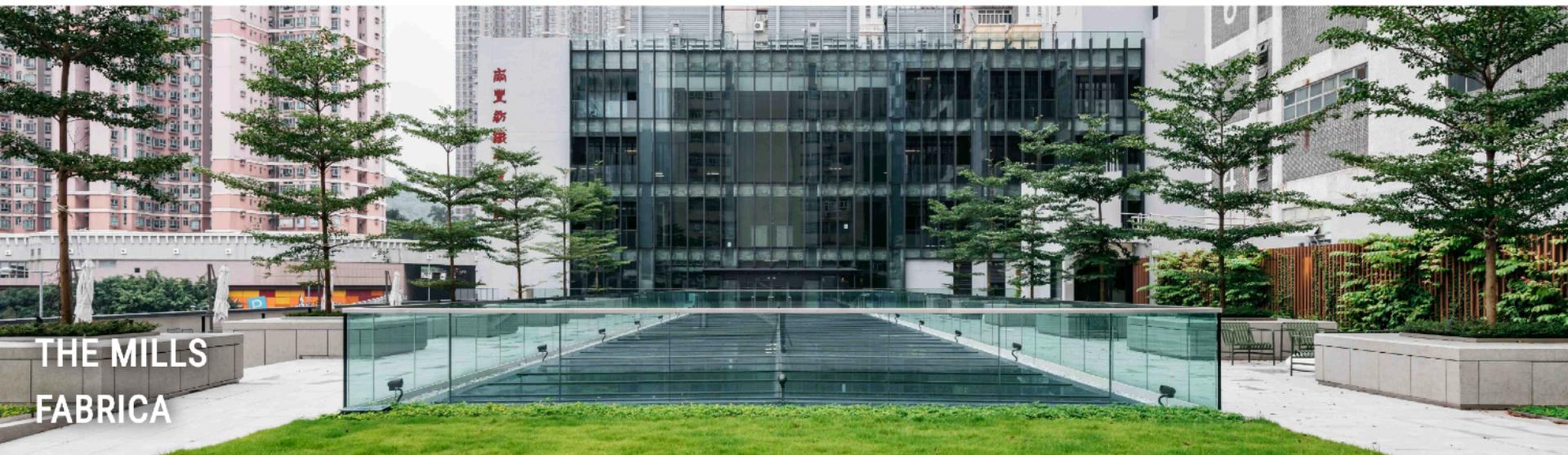
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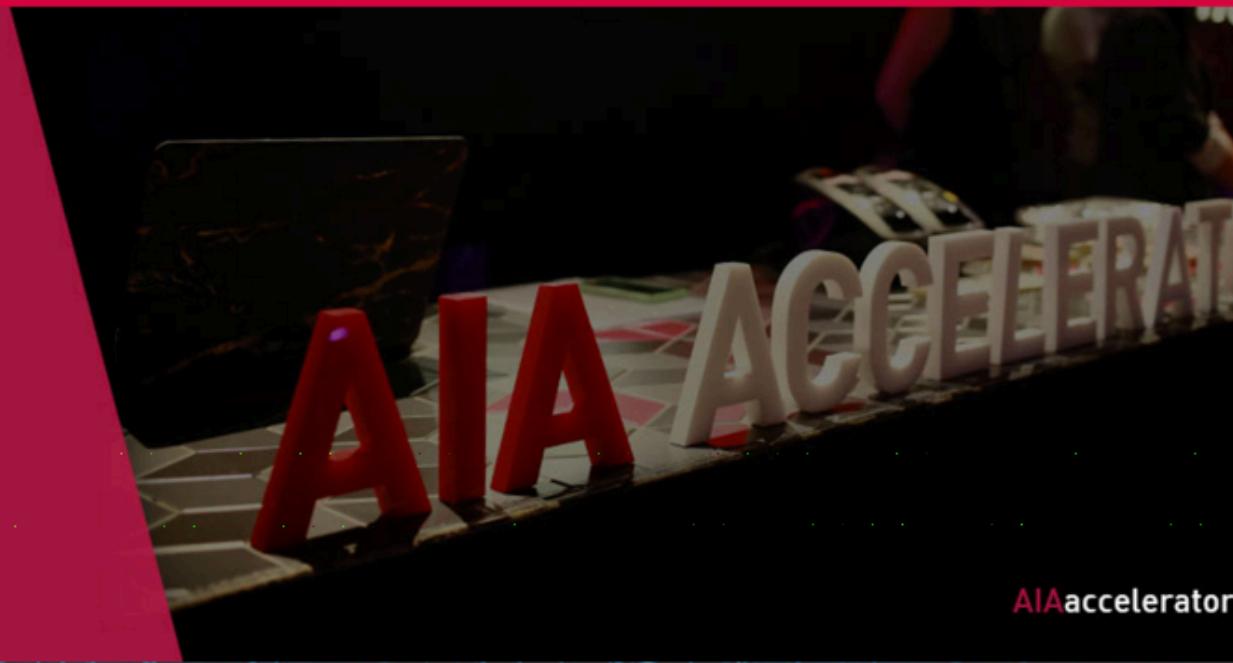
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#AIAaccelerator

AIA Accelerator 4.0

an innovation partnership with
KPMG Digital Village



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#AIABLOCKCHAIN

AIA BLOCKCHAIN CHALLENGE





The 2016 DBS Accelerator

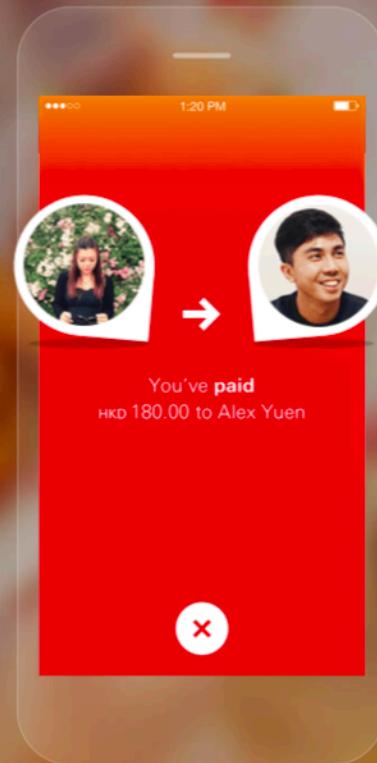
Driving change and sparking
innovation in financial services

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Remaking of HSBC.

Pay anyone with any bank



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Pay your friends with just a few taps,
regardless of which Hong Kong local
bank they use and without ever asking
for an account number.

[How it works](#)

Why HSBC joined the payment system race?



Playing the platform game will enable HSBC to develop direct relationship with the customers without going through other intermediary channels.

Ultimately, the platform is the channel.

MENU

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AWARDS

DECEMBER 3, 2020

AUDIENCE DATA BUSINESS DATA DATA
EDITOR'S PICK PUBLISHERS

The News 50: Tech giants dwarf Rupert Murdoch to become the biggest new companies in English-speaking countries

By William Turvill 

 TWEET

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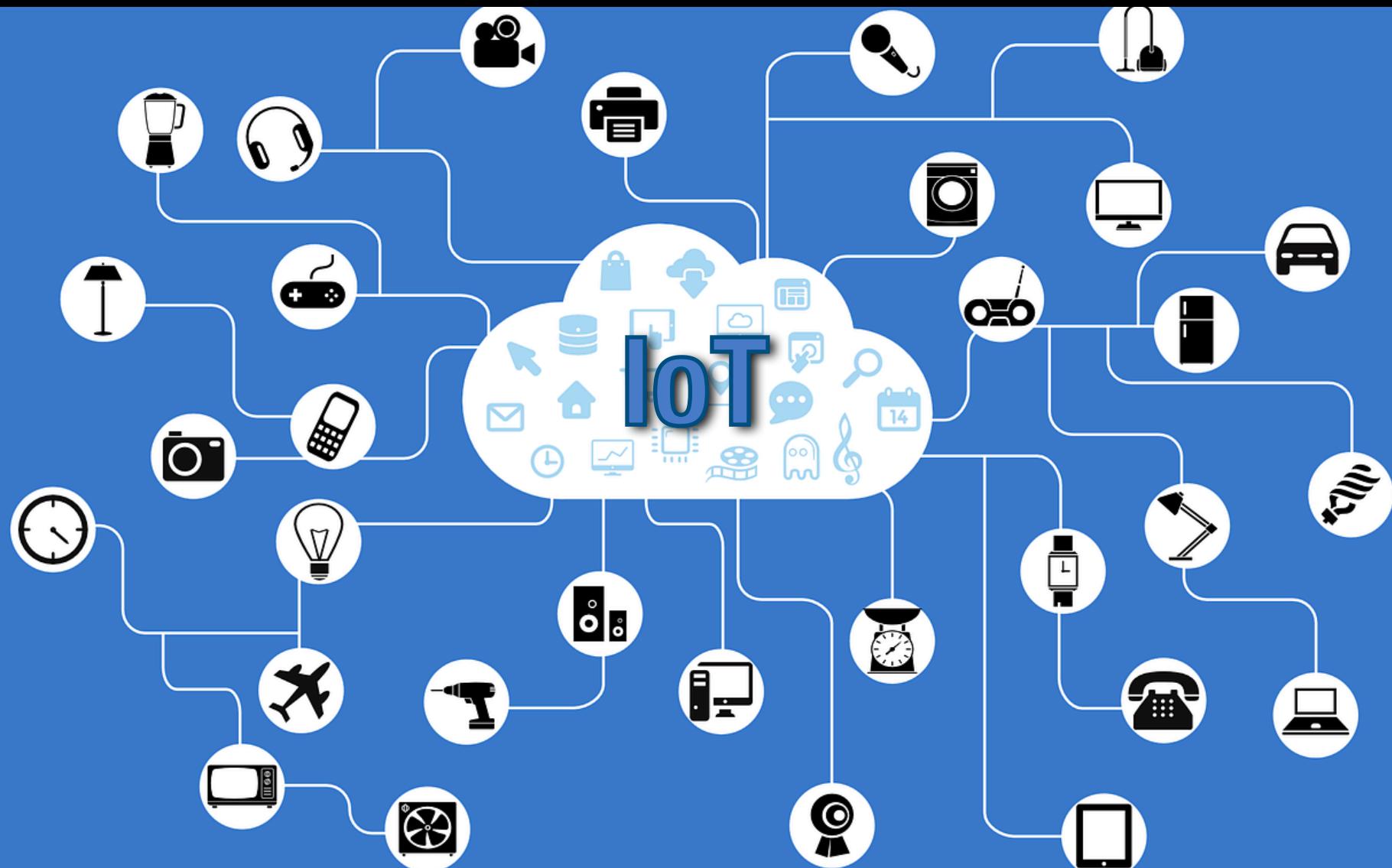
Today, Google (renamed Alphabet at a corporate level) and Facebook are together known as the Duopoly. Their dominance of the digital advertising market makes them the two biggest media (and news) businesses in the world by some margin.

Alphabet's \$150bn advertising revenues are more than 15 times greater than the \$9bn total turnover of Murdoch's **News Corp.**

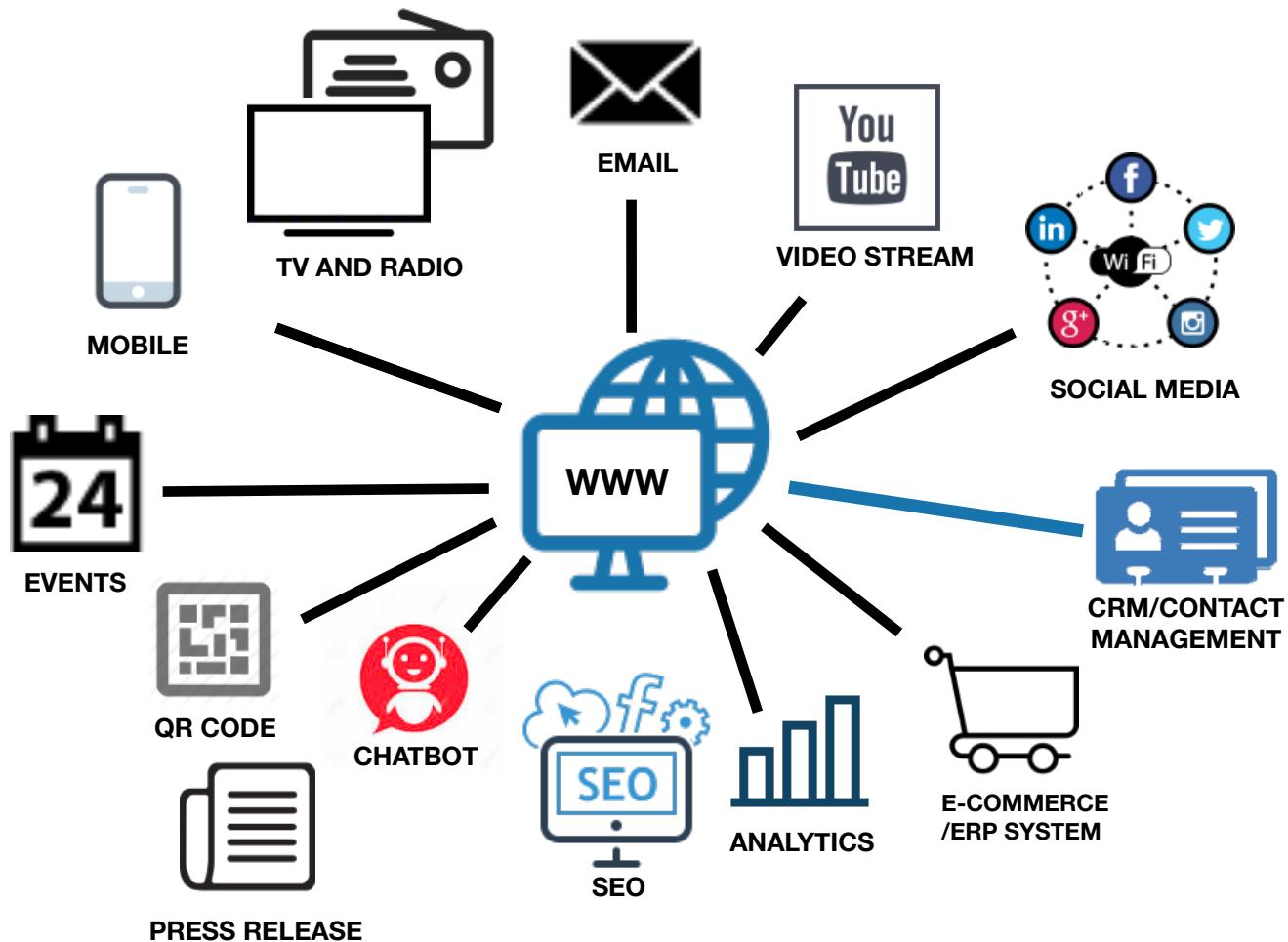
Coming in behind **Facebook**, which reported ad revenues of \$69.7bn last year, is fellow tech giant **Apple**.

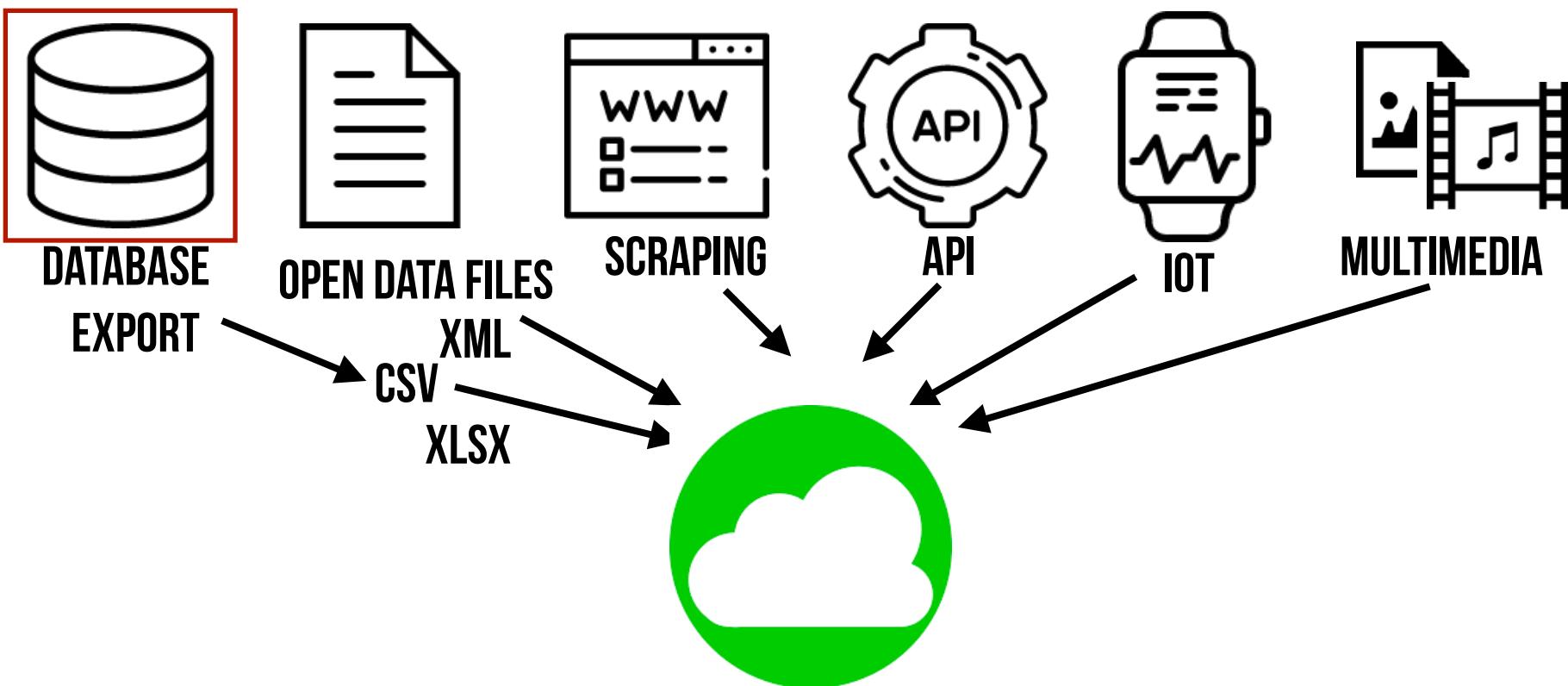
Big Data is a platform game.

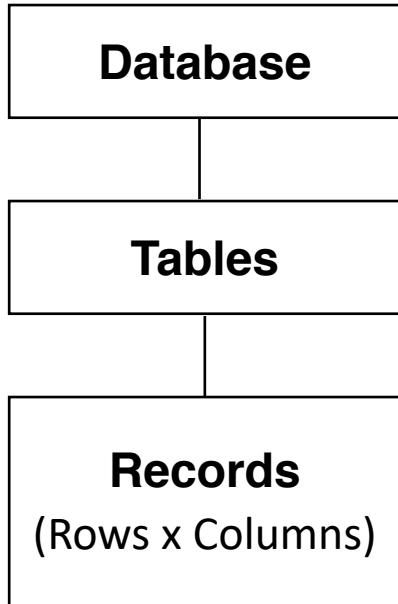
What is Big Data?











“A **database** is a collection of **tables** which relate to each other for storing and processing **records** that are defined by rows and columns (**fields**).”

In traditional database terminology, this is call
Relational SQL Database.

Mon 12/7/2020 2:04 PM



To: Bernard Suen (COM)



MGNT3070 Class list (202012...
5 MB

Dear Professor Suen,

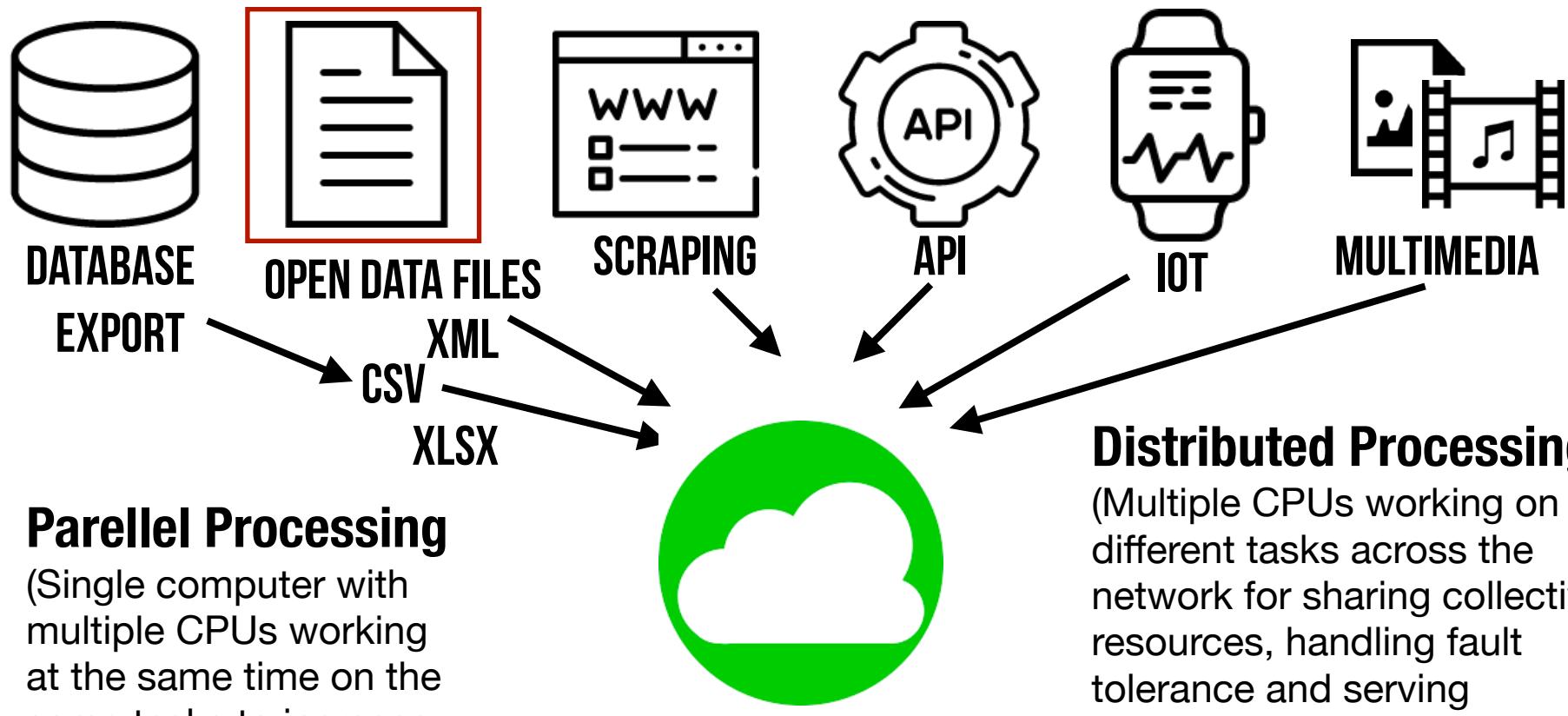
This is “XYZ” from the General Office of the Department of Management.

Attached is the tentative class list of MGMT3070 which is subject to change before the add-drop period ends on 29 January 2020 (Fri). I will send you the updated list after the add-drop period. Thank you.

Best Regards

Department of Management
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[Reply](#) | [Forward](#)



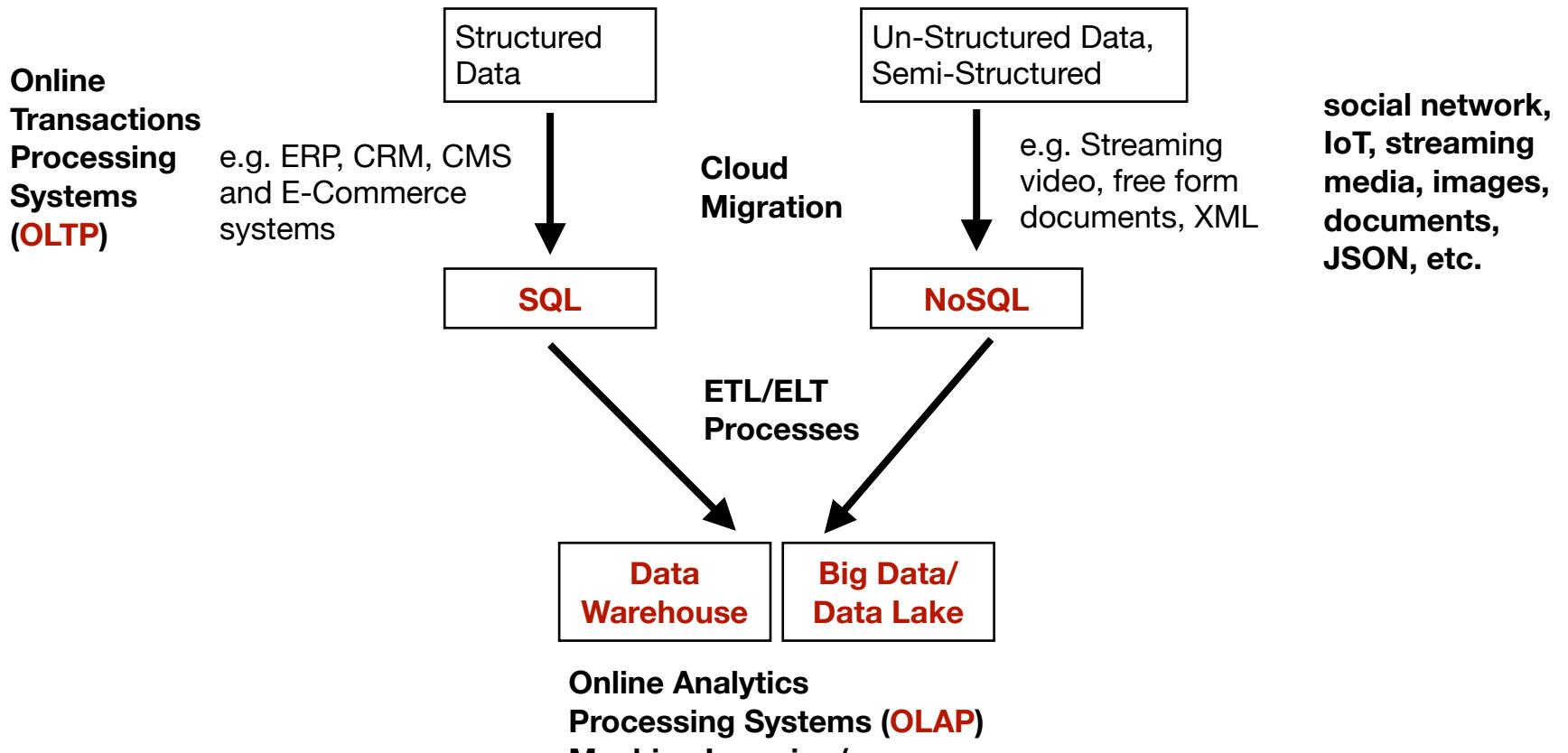
VOLUME - VELOCITY - VARIETY - VERACITY

From SQL to NoSQL

Storing data

DATABASE DESIGN





ETL - Extract, Transform, Load

ELT - Extract, Load, Transform

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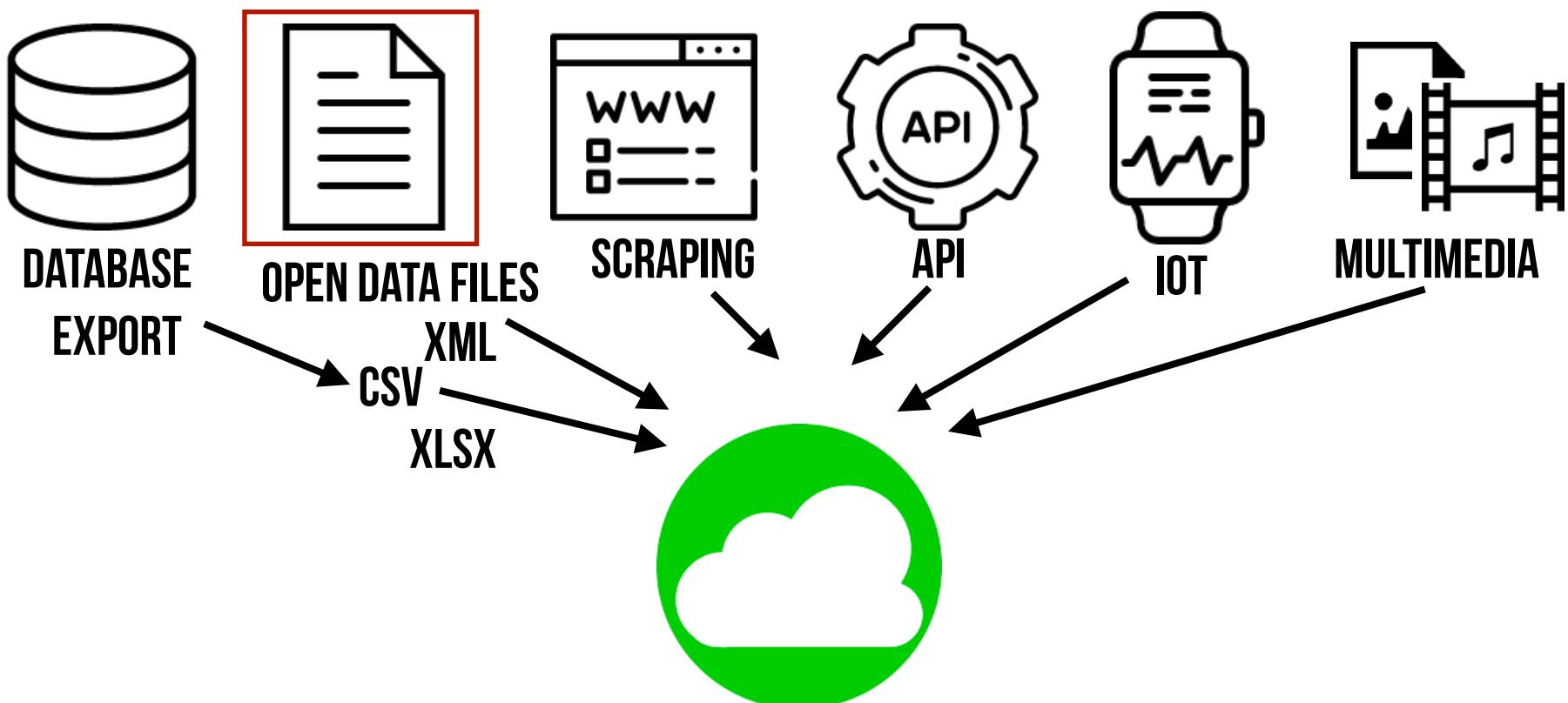
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Open Data for All New Yorkers

Where can you find public Wi-Fi in your neighborhood? What kind of tree is in front of your office? Learn about where you live, work, eat, shop and play using NYC Open Data.

Search Open Data for things like 311, Buildings, Crime



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Data 

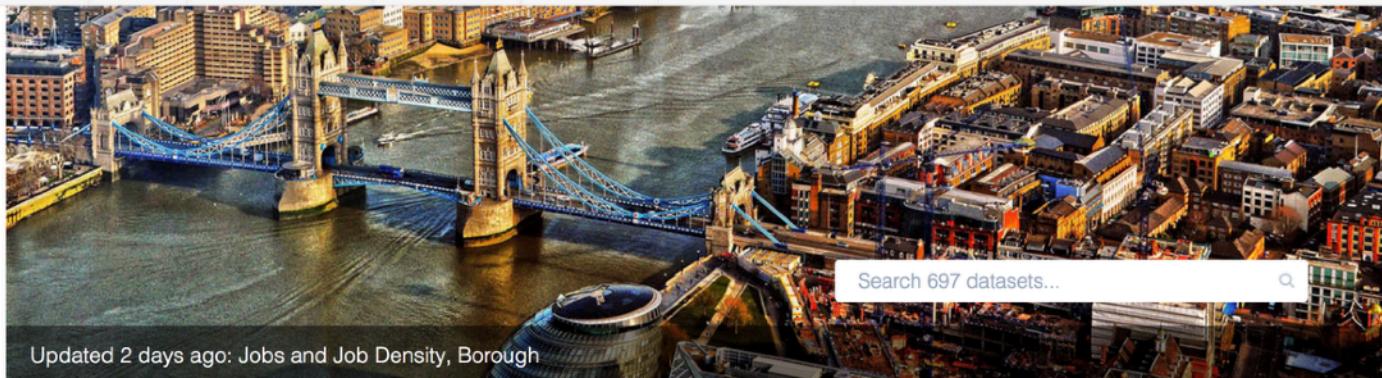
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City Data Strategy 

More 



JOBs AND ECONOMY



TRANSPORT



ENVIRONMENT



COMMUNITY SAFETY



HOUSING



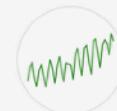
COMMUNITIES



HEALTH



LONDON AS A WORLD CITY



GLA PERFORMANCE



Click on a circle to see more...

Welcome to the Datastore

The London Datastore is a free and open data-sharing portal where anyone can access data relating to the capital. Whether you're a citizen, business owner, researcher or developer, the site provides over 700 datasets to help you understand the city and develop solutions to London's problems. Please do have a look around and [let us know](#) what you think.



Open Data

Home > Open Data

Smart Mobility

Smart Living

Smart Environment

Smart People

Smart
Government

Smart Economy

Open Data



2020-2022 Annual Open Data Plans Are Now Published



New to The Site? [START HERE](#)

Search Data e.g. population 

BROWSE DATASETS

<https://data.gov.hk/en/>

- Convert JSON (popular format used in API data delivery) to CSV file (<https://codebeautify.org/jsonviewer>)
- Convert XML data to CSV file (<https://www.convertcsv.com/xml-to-csv.htm>)
- Import CSV into Excel, Google Sheet, Numbers, or SQL/NoSQL database.

DATASETS

GEOSPATIAL DATA



CITY DASHBOARD

City dynamics at a glance

New to The Site? **START HERE**

Search Data e.g. population

**BROWSE DATASETS**<https://data.gov.hk/en-data/dataset/hk-lcsd-facility-facility-bkbc>



HOME DATA LEARN COMMUNITY



ENG ▾

Home > Datasets > Basketball Courts (Free Outdoor Pitches/Courts)

Basketball Courts (Free Outdoor Pitches/Courts)

LEISURE AND CULTURAL SERVICES DEPARTMENT |

Recreation and Culture



UPDATE FREQUENCY: AS AND WHEN NEW FACILITY IS ADDED OR AMENDMENT IS MADE

Location of Basketball Courts (Free Outdoor Pitches/Courts)

Data Dictionary : https://www.lcsd.gov.hk/datagovhk/facility/facility-bkbc_data_dictionary.pdf

1 JSON file(s)



Add All to Queue

[{"District_en": "Kowloon City", "District_cn": "九龍城區", "Name_en": "Carpenter Road Park", "Name_cn": "賈炳達道公園", "Address_en": "Carpenter Road, Kowloon City, Kowloon.", "Address_cn": "九龍城賈炳達道", "GIHS": "9G5i7NFpXL", "Court_no_en": "4", "Court_no_cn": "4", "Ancillary_facilities_en": "Toilets are provided in the Park.
Other facilities include a jogging track, 7 fitness stations, a cycling track, 2 sets of children's playground, an elderly fitness station, a 7-a-side hard-surface soccer pitch and 2 volleyball courts.
Barrier Free Facilities: Accessible Toilet, Tactile Guide Path, Braille Directory Map\\Floor Plan
", "Ancillary_facilities_cn": "公園內設有洗手間
其他設施包括1條緩跑徑、7個健身站、1條單車徑、2個兒童遊樂場、1個長者健身站、1個7人硬地足球場和2個排球場
無障礙設施: 暢通易達洗手間、觸覺引路帶、觸覺點字及觸覺平面圖。
", "Opening_hours_en": "7 am to 11 pm daily", "Opening_hours_cn": "每日上午7時至晚上11時", "Phone": "2716 9962", "Remarks_en": "", "Remarks_cn": "", "Longitude": "114-11-27", "Latitude": "22-19-52"}, {"District_en": "Kowloon City", "District_cn": "九龍城區", "Name_en": "Ho Man Tin Park", "Name_cn": "何文田公園", "Address_en": "No.1 Chung Yee Street, Ho Man Tin, Kowloon.", "Address_cn": "九龍何文田忠義街一號", "GIHS": "MSKgwBPmtd", "Court_no_en": "2", "Court_no_cn": "2", "Ancillary_facilities_en": "Men's and ladies' changing rooms and toilets
A fee-charging car park (including 1 designated disabled parking space)
Other facilities include a hard-surface 7-a-side soccer pitch cum handball court, a children's playground and a jogging track with 6 fitness stations.
Barrier Free Facilities: Accessible Toilet, Tactile Guide Path, Braille Directory Map\\Floor Plan", "Ancillary_facilities_cn": "男、女更衣室及洗手間
1個收費停車場 (設有1個殘疾人士專用車位)
其他設施包括1個硬地7人足球場兼手球場、1個兒童遊樂場、1條緩跑徑和6個健身站
無障礙設施: 暢通易達洗手間、觸覺引路帶、觸覺點字及觸覺平面圖", "Opening_hours_en": "7 am to 11 pm daily", "Opening_hours_cn": "每日上午7時至晚上11時", "Phone": "2762 7837", "Remarks_en": "", "Remarks_cn": "", "Longitude": "114-10-50", "Latitude": "22-18-44"}, {"District_en": "Kowloon City", "District_cn": "九龍城區", "Name_en": "Hoi Sham Park", "Name_cn": "海心公園", "Address_en": "Yuk Yat Street, Tokwawan, Kowloon.", "Address_cn": "九龍土瓜灣旭日街", "GIHS": "nZ2deVMDpF", "Court_no_en": "1", "Court_no_cn": "1", "Ancillary_facilities_en": "Men's and ladies' toilets
Other facilities include 2 hard-surface 5-a-side soccer, a children's playground and elderly fitness equipment.
Barrier Free Facilities: Accessible Toilet, Tactile Guide Path, Braille Directory Map\\Floor Plan", "Ancillary_facilities_cn": "男、女洗手間
其他設施包括2個硬地5人足球場、兒童遊樂場及長者健體設施
無障礙設施: 暢通易達洗手間、觸覺引路帶、觸覺點字及觸覺平面圖", "Opening_hours_en": "7 am to 11 pm daily", "Opening_hours_cn": "每日上午7時至晚上11時", "Phone": "2334 3576 \ 2762 2083", "Remarks_en": "", "Remarks_cn": "", "Longitude": "114-11-30", "Latitude": "22-18-54"}, {"District_en": "Kowloon City", "District_cn": "九龍城區", "Name_en": "Junction Road Park", "Name_cn": "聯合道公園", "Address_en": "Junction Road, Kowloon City, Kowloon.", "Address_cn": "九龍聯合道", "GIHS": "9G5i7NFpXL", "Court_no_en": "4", "Court_no_cn": "4", "Ancillary_facilities_en": "Toilets are provided in the Park.
Other facilities include a jogging track, 7 fitness stations, a cycling track, 2 sets of children's playground, an elderly fitness station, a 7-a-side hard-surface soccer pitch and 2 volleyball courts.
Barrier Free Facilities: Accessible Toilet, Tactile Guide Path, Braille Directory Map\\Floor Plan
", "Ancillary_facilities_cn": "公園內設有洗手間
其他設施包括1條緩跑徑、7個健身站、1條單車徑、2個兒童遊樂場、1個長者健身站、1個7人硬地足球場和2個排球場
無障礙設施: 暢通易達洗手間、觸覺引路帶、觸覺點字及觸覺平面圖。
", "Opening_hours_en": "7 am to 11 pm daily", "Opening_hours_cn": "每日上午7時至晚上11時", "Phone": "2716 9962", "Remarks_en": "", "Remarks_cn": "", "Longitude": "114-11-27", "Latitude": "22-19-52"}]

JSON Viewer★

Save & Share

Sample

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  "Address_cn": "九龍城賈炳達道", "GIHS": "9G5i7NFnXL",  
  "Court_no_en": "4", "Court_no_cn": "4",  
  "Ancillary_facilities_en": "<li>Toilets are provided in the Park.<br><li>Other facilities include a jogging track, 7 fitness stations, a cycling track, 2 sets of children's playground, an elderly fitness station, a 7-a-side hard-surface soccer pitch and 2 volleyball courts.<br><li>Barrier Free Facilities: Accessible Toilet, Tactile Guide Path, Braille Directory Map</Floor Plan<br>"},  
  "Ancillary_facilities_cn": "<li>公園內設有洗手間<br><li>其他設施包括1條緩跑徑、7個健身站、1條單車徑、2個兒童遊樂場、1個長者健身站、1個7人硬地足球場和2個排球場<br><li>無障礙設施：暢通易達洗手間、觸覺引路帶、觸覺點字及觸覺平面圖。<br>", "Opening_hours_en": "7 am to 11 pm daily",  
  "Opening_hours_cn": "每日上午7時至晚上11時", "Phone": "2716 9962", "Remarks_en": "", "Remarks_cn": "", "Longitude": "114-11-27", "Latitude": "22-19-52"}, {"District_en": "Kowloon City", "District_cn": "九龍城區", "Name_en": "Ho Man Tin Park", "Name_cn": "何文田公園", "Address_en": "No.1 Chung Yee Street, Ho Man Tin, Kowloon.", "Address_cn": "九龍何文田忠義街一號", "GIHS": "MSKgwBPmtd", "Court_no_en": "2", "Court_no_cn": "2", "Ancillary_facilities_en": "<li>Men's and ladies' changing rooms and toilets<br><li>A fee-charging car park (including 1 designated disabled parking space)<br><li>Other facilities include a hard-surface 7-a-side soccer pitch cum handball court, a children's playground and a jogging track with 6 fitness stations.<br><li>Barrier Free Facilities: Accessible Toilet, Tactile Guide Path, Braille Directory Map</Floor Plan", "Opening_hours_en": "7 am to 11 pm daily", "Opening_hours_cn": "每日上午7時至晚上11時", "Phone": "2716 9962", "Remarks_en": "", "Remarks_cn": "", "Longitude": "114-11-27", "Latitude": "22-19-52"}]
```

Result mode:

view ▾

Load Url

Browse

Tree Viewer

2 Tab Space ▾

Beautify

(i) X

Website Designer Near You

Stallions SEO LLC

We want to make you
businesses phone ring!

OPEN

Minify

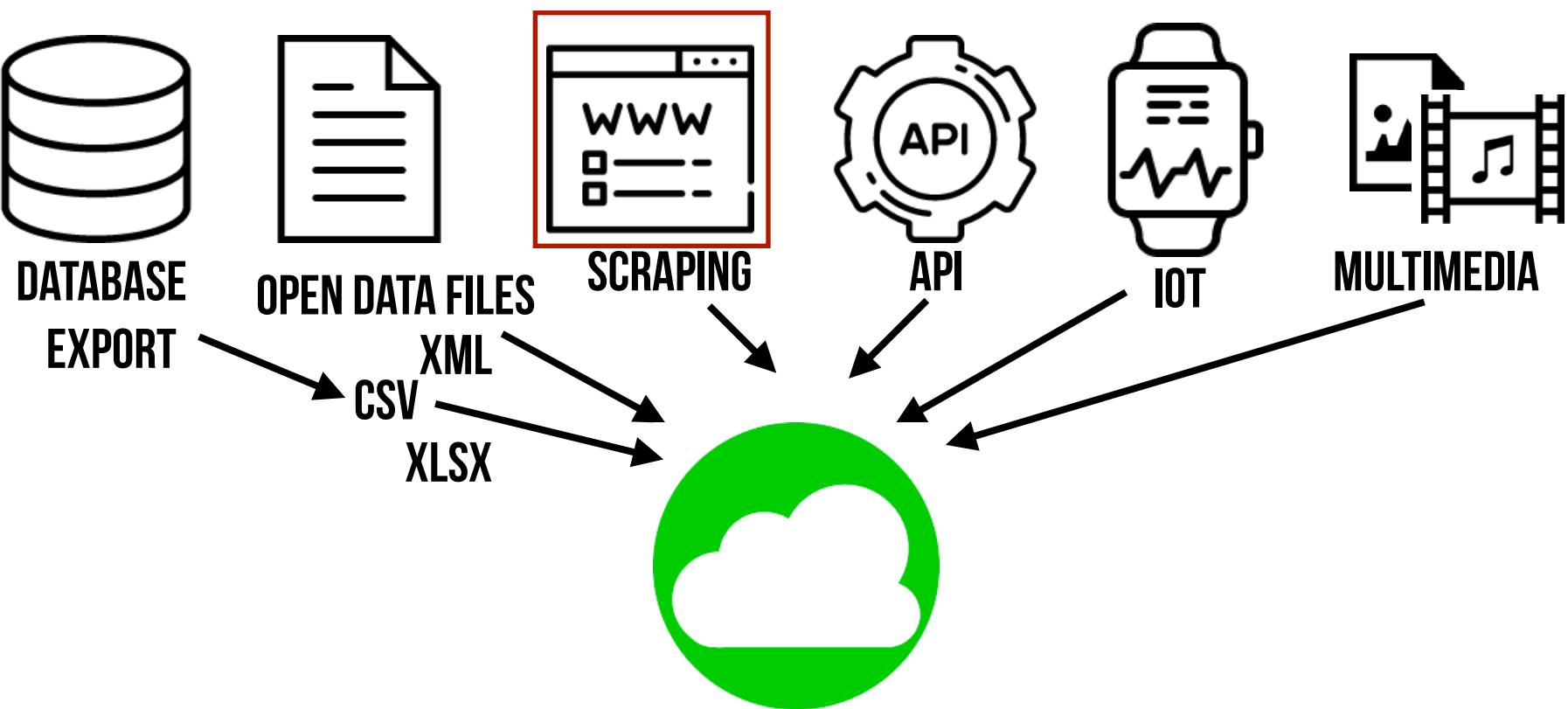
Validate

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array > 0 >
▼ array [228]
  ▼ 0 {18}
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    District_cn : 九龍城區
    Name_en : Carpenter Road Park
    Name_cn : 賈炳達道公園
    Address_en : Carpenter Road, Kowloon City, Kowloon.
    Address_cn : 九龍城賈炳達道
    GIHS : 9G5i7NFpXL
    Court_no_en : 4
    Court_no_cn : 4
    Ancillary_facilities_en : <li>Toilets are provided in the Park.<br><li>Other facilities include a jogging track, 7 fitness stations, a cycling track, 2 sets of children's playground, an elderly fitness station, a 7-a-side hard-surface soccer pitch and 2 volleyball courts.<br><li>Barrier Free Facilities: Accessible Toilet, Tactile Guide Path, Braille Directory Map/Floor Plan<br>
    Ancillary_facilities_cn : <li>公園內設有洗手間<br><li>其他設施包括1條緩跑徑、7個健身站、1條單車徑、2個兒童遊樂場、1個長者健身體站、1個7人硬地足球場和2個排球場<br><li>無障礙設施 暢通易達洗手間、觸覺引路帶、觸
```

<https://codebeautify.org/jsonviewer>

District_en	District_cn	Name_en	Name_cn	Address_en
Kowloon City	九龍城區	Carpenter Road Park	賈炳達道公園	Carpenter Road, Kowloon City, Kowloon.
Kowloon City	九龍城區	Ho Man Tin Park	何文田公園	No.1 Chung Yee Street, Ho Man Tin, Kowloon.
Kowloon City	九龍城區	Hoi Sham Park	海心公園	Yuk Yat Street, Tokwawan, Kowloon.
Kowloon City	九龍城區	Junction Road Park	聯合道公園	195 Junction Road, Kowloon City.
Kowloon City	九龍城區	Kam Shing Road Recreation Ground	金城道遊樂場	Kam Shing Road, Kowloon.
Kowloon City	九龍城區	Kau Pui Lung Road Playground	靠背壘道遊樂場	Kau Pui Lung Road, Kowloon.
Kowloon City	九龍城區	Kent Road Garden	根德道花園	Kent Road, Kowloon.
Kowloon City	九龍城區	King Wan Street Playground	景雲街遊樂場	King Wan Street, To Kwa Wan, Kowloon.
Kowloon City	九龍城區	King's Park High Level Service Reservoir Playground	京士柏上配水庫遊樂場	Chung Hau Street, Ho Man Tin, Kowloon.
Kowloon City	九龍城區	Kowloon Tsai Park	九龍仔公園	13 Inverness Road, Kowloon City, Kowloon.
Kowloon City	九龍城區	Lung Cheung Road Playground	龍翔道遊樂場	Beacon Hill Road, Kowloon.
Kowloon City	九龍城區	Ma Tau Wai Road Playground	馬頭圍道遊樂場	Ma Tau Wai Road, Tokwawan, Kowloon.
Kowloon City	九龍城區	Oxford Road Playground	牛津道遊樂場	Oxford Road, Kowloon.
Kowloon City	九龍城區	Peace Avenue Playground	太平道遊樂場	Peace Avenue, Ho Man Tin, Kowloon.
Kowloon City	九龍城區	Perth Street Sports Ground	巴富街運動場	Shek Ku Street , Ho Man Tin, Kowloon.
Kowloon City	九龍城區	Pui Ching Road Playground	培正道遊樂場	Pui Ching Road, Ho Man Tin, Kowloon.
Kowloon City	九龍城區	Rutland Quadrant Children's Playground	律倫街兒童遊樂場	Rutland Quadrant, Kowloon.
Kowloon City	九龍城區	Sung Wong Toi Playground	宋王臺遊樂場	Sung Wong Toi Road, Kowloon.
Kowloon City	九龍城區	Tai Wan Road Playground	大環道遊樂場	Tai Wan Road, Hung Hom, Kowloon.
Kowloon City	九龍城區	Tai Wan Shan Park	大環山公園	Wan Hoi Street, Hung Hom, Kowloon.
Kowloon City	九龍城區	To Kwa Wan Recreation Ground	土瓜灣遊樂場	66 Ha Ha Ling Road, To Kwa Wan, Kowloon

Implication: City as a platform. Country as a platform.



VOLUME - VELOCITY - VARIETY - VERACITY

Data

Dynamic Web Building

ID	PHONE	POPULARNAME	PREFERREDNAME	LATITUDE	LONGITUDE
1194620	00994614	popular_name_00994614	preferred_name_00994614	23.789675	88.897665
1194621	00994615	popular_name_00994615	preferred_name_00994615	23.789675	88.897665
1194622	00994616	popular_name_00994616	preferred_name_00994616	23.789675	88.897665
1194623	00994617	popular_name_00994617	preferred_name_00994617	23.789675	88.897665
1194624	00994618	popular_name_00994618	preferred_name_00994618	23.789675	88.897665
1194625	00994619	popular_name_00994619	preferred_name_00994619	23.789675	88.897665
1194626	00994620	popular_name_00994620	preferred_name_00994620	23.789675	88.897665
1194627	00994621	popular_name_00994621	preferred_name_00994621	23.789675	88.897665
1194628	00994622	popular_name_00994622	preferred_name_00994622	23.789675	88.897665
1194629	00994623	popular_name_00994623	preferred_name_00994623	23.789675	88.897665
1194630	00994624	popular_name_00994624	preferred_name_00994624	23.789675	88.897665
1194631	00994625	popular_name_00994625	preferred_name_00994625	23.789675	88.897665

Web Publishing



Web



Data

Web Scraping

Web



Screenshot of a SQL Server Management Studio (SSMS) interface showing a table named 'detailed_contacts'.

ID	PHONE	POPULARNAME	PREFERREDNAME	LATITUDE	LONGITUDE
1194620	00994614	popular_name_00994614	preferred_name_00994614	23.789675	88.897665
1194621	00994615	popular_name_00994615	preferred_name_00994615	23.789675	88.897665
1194622	00994616	popular_name_00994616	preferred_name_00994616	23.789675	88.897665
1194623	00994617	popular_name_00994617	preferred_name_00994617	23.789675	88.897665
1194624	00994618	popular_name_00994618	preferred_name_00994618	23.789675	88.897665
1194625	00994619	popular_name_00994619	preferred_name_00994619	23.789675	88.897665
1194626	00994620	popular_name_00994620	preferred_name_00994620	23.789675	88.897665
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1194628	00994622	popular_name_00994622	preferred_name_00994622	23.789675	88.897665
1194629	00994623	popular_name_00994623	preferred_name_00994623	23.789675	88.897665
1194630	00994624	popular_name_00994624	preferred_name_00994624	23.789675	88.897665
1194631	00994625	popular_name_00994625	preferred_name_00994625	23.789675	88.897665



A web scraping tool that is easy to use

ParseHub is a free web scraping tool. With our advanced web scraper, extracting data is as easy as clicking the data you need.

Download our free app



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



Open a website

Download our [desktop app](#). Choose a site to scrape data from.



Click to select data

Get data from multiple pages. Interact with AJAX, forms, dropdowns, etc.



Download results

Access data via JSON, Excel and [API](#). Data is collected by our servers.



Projects

Runs

My Account

Integrations

Plans & Billing

Tutorials

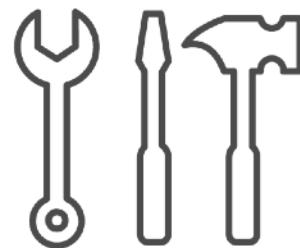
Documentation

API

Contact

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travelchinaguide.com Project



startupbeat.hkej.com Project



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Interactive Tutorials

✓ Learn the Basics (8 min)

✓ Select and Download Data (3 min)

✓ Group data with Relative Select (3 min)

✓ Click and Navigate to Links (4 min)

Written Tutorials

1 Parsehub 101

2 Pagination ('next' page buttons)

3 Scrape product details

4 Scrape leads from directories

Search entire store here...



My Cart HK\$0.00

NEW IN

WOMEN

MEN

KIDS

FOOTWEAR

APPAREL

ACCESSORIES

BRANDS

SALE

KAKAO FRIENDS X CATALOG

Home ▶ Footwear

SHOP BY

CATEGORY

Sneakers	406
Casual Footwear	262
Sandals	133

BRANDS

adidas	Age	Asics	Birkenstock
BT21 MEETS	Converse	Crocs	
CATALOG	Dr. Martens		
Havaianas	Jason Markk	Keen	

Sort By:

 Show: Page: <https://eshop.cataloghk.com/footwear.html>

main_template

eshop.c...

BROWSE

...
Select page +
Select footwear +
Extract brand
Relative product +
Relative price (69) +

Get Data

Selection Node: [Edit](#)
 All elements
 All elements with class **price**
 Wait up to **60** seconds for elements to appear.

Catalog HK Online Store Foot ↗ <https://eshop.cataloghk.com/footwear.html>

Select Mode

Get Data

Selection Node: [Edit](#)
 All elements
 All elements with class **price**
 Wait up to **60** seconds for elements to appear.

CSV/Excel **JSON** **CSV/Excel Wide (beta)**

footwear_brand	footwear_product	footwear_product_url	footwear_price
Converse	WOMEN CONVERSE BLACK ICE ...	HK\$639.00	
Converse	WOMEN CONVERSE BLACK ICE ...	HK\$639.00	
adidas	UNISEX ADIDAS ORIGINALS X_P...	HK\$699.00	

Show more data ? Visuals enabled (advanced) ?



eshop.cataloghk.com Project

[Edit project](#)

Your data is ready! Click on the green buttons to download.

Download Data

CSV/Excel ▾

JSON

API

[Report an issue here.](#)

Template Name

Pages Scrapped

main_template

14

All dates and times are in UTC +0000.

Empty file with no results? [Click here](#) to fix.

CSV file too big? Save the JSON file and [click here](#) to convert to CSV.

Run Details

Status	complete
Pages	14 collected
Initialized	2020-10-28T15:41:35

Settings

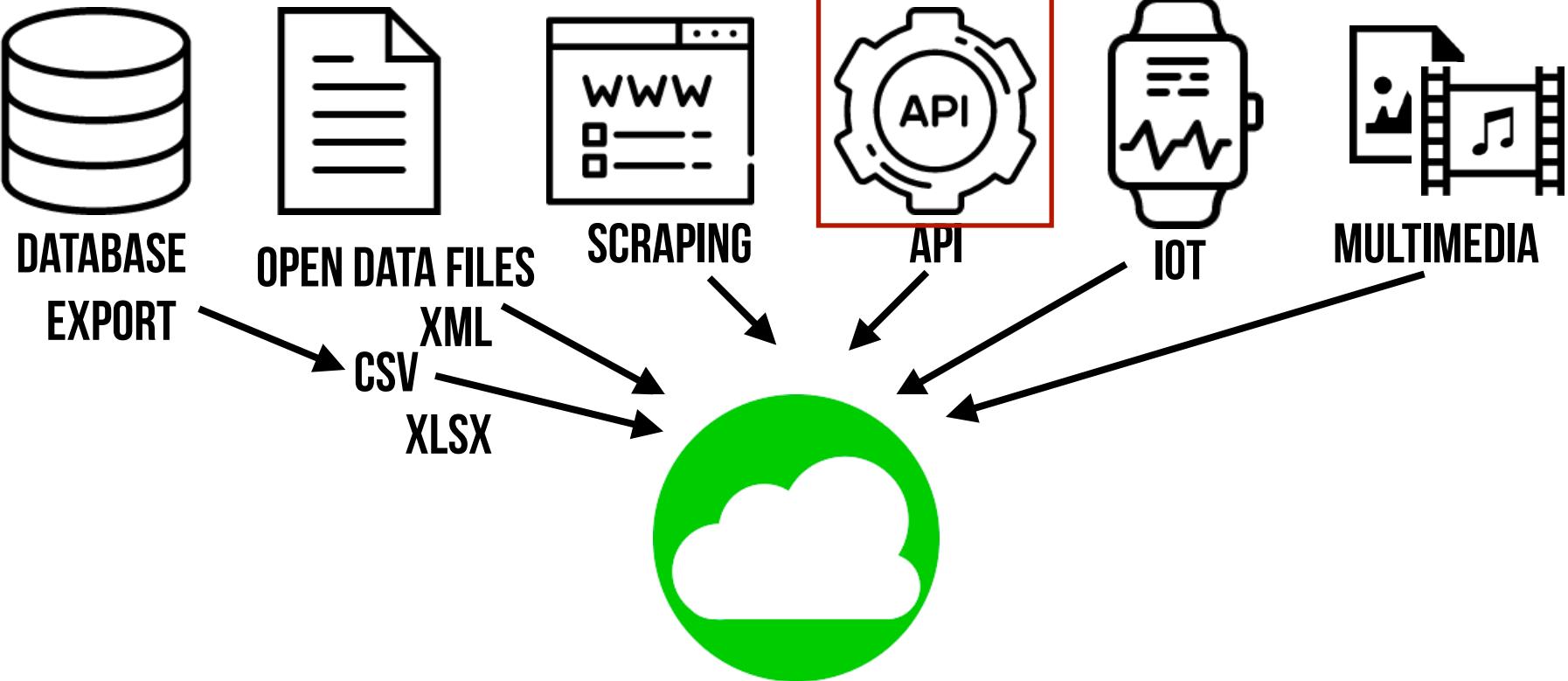
URL

<https://eshop.cataloghk.com/footwear.html>



Converse	WOMEN CONVERSE BLACK ICE CHUCK 70 HI TOP	https://eshop.cataloghk.com/150569539c.html	H
Converse	WOMEN CONVERSE BLACK ICE CHUCK 70 HI TOP	https://eshop.cataloghk.com/150569540c.html	H
adidas	UNISEX ADIDAS ORIGINALS X_PLR S	https://eshop.cataloghk.com/108fy2852.html	H
adidas	UNISEX ADIDAS ORIGINALS SUPERSTAR 2020 PURE	https://eshop.cataloghk.com/108fu9519.html	H
adidas	UNISEX ADIDAS ORIGINALS SUPERSTAR 2020	https://eshop.cataloghk.com/108fu9521.html	H
adidas	WOMEN ADIDAS ORIGINALS SUPERSTAR	https://eshop.cataloghk.com/108h69025.html	H
adidas	UNISEX ADIDAS ORIGINALS SUPERSTAR 2020	https://eshop.cataloghk.com/108fw5388.html	H
Converse	UNISEX CONVERSE CHUCK 70 HIGH TOP	https://eshop.cataloghk.com/150169336c.html	H
Converse	WOMEN CONVERSE CHUCK TAYLOR ALL STAR LIFT LEATHER HIGH TOP	https://eshop.cataloghk.com/150561676c.html	H
Converse	WOMEN CONVERSE CHUCK TAYLOR ALL STAR LIFT LEATHER HIGH TOP	https://eshop.cataloghk.com/150561675c.html	H
Converse	UNISEX CONVERSE SEASONAL COLOUR VINTAGE CANVAS CHUCK 70 HIGH TOP	https://eshop.cataloghk.com/150169341c.html	H
Converse	UNISEX CONVERSE VINTAGE CANVAS CHUCK 70 HIGH TOP	https://eshop.cataloghk.com/150169342c.html	H
Converse	UNISEX CONVERSE SEASONAL COLOUR VINTAGE CANVAS CHUCK 70 LOW TOP	https://eshop.cataloghk.com/150169343c.html	H
Converse	UNISEX CONVERSE SEASONAL COLOUR VINTAGE CANVAS CHUCK 70 LOW TOP	https://eshop.cataloghk.com/150169344c.html	H
Keen	WOMEN KEEN UNEEK SNK	https://eshop.cataloghk.com/1kn1023508.html	HK
Age	UNISEX AGE CUT KILLERWHALE	https://eshop.cataloghk.com/1abgrctwhbk011.html	H
Keen	WOMEN KEEN UNEEK SNK	https://eshop.cataloghk.com/1kn1023506.html	HK
PUMA	WOMEN PUMA CILIA LUX	https://eshop.cataloghk.com/1pu37028215.html	H
Age	UNISEX AGE TOP REFLECTIVE AURORA	https://eshop.cataloghk.com/1abrftoprnbk013.html	H
Keen	MEN KEEN UNEEK SNK	https://eshop.cataloghk.com/1kn1023500.html	HK
Age	UNISEX AGE CUT MA-1	https://eshop.cataloghk.com/1abmactolbk011.html	H
Age	UNISEX AGE CUT REFLECTIVE AURORA	https://eshop.cataloghk.com/1abrfctrnbk011.html	H

			Sheet 1
	FUMA A	WOMEN FUMA DUVIA AMOUR HERITAGE WNS B	https://eshop.cataloghk.com/1pus709470.html C
793	adidas	UNISEX ADIDAS ORIGINALS OZWEEGO	https://eshop.cataloghk.com/108ee7002.html
794	STARE	WOMEN STARE M4807 ORIGINAL	https://eshop.cataloghk.com/1tsstu91lo006bg.html
795	BT21 MEETS CAT	WOMEN BT21 MEETS CATALOG COOKY SLIP ON	https://eshop.cataloghk.com/1b1sjdf19bt132pn.html
796	VANS	UNISEX VANS BRUSHED TWILL STYLE 36	https://eshop.cataloghk.com/105vn0a3dz3vlq.html
797	adidas	WOMEN ADIDAS ORIGINALS CONTINENTAL 80	https://eshop.cataloghk.com/108eg4592.html
798	Reebok	LITTLE KIDS REEBOK VERSA PUMP FURY	https://eshop.cataloghk.com/101dv8544.html
799	Reebok	UNISEX REEBOK CLASSIC SLIDE	https://eshop.cataloghk.com/101dv3698.html
800	Reebok	UNISEX REEBOK CLASSIC SLIDE	https://eshop.cataloghk.com/101dv3697.html
801	Converse	UNISEX CONVERSE CHUCK TAYLOR ALL STAR LOW TOP	https://eshop.cataloghk.com/150m9007c.html
802	New Balance	UNISEX NEW BALANCE 200 SLIDES	https://eshop.cataloghk.com/112smf200b1.html
803	Reebok	BIG KIDS REEBOK ROYAL RIPPLE WHITE/PURPLE	https://eshop.cataloghk.com/101dv4329.html
804	Reebok	BIG KIDS REEBOK ROYAL RIPPLE WHITE/PINK	https://eshop.cataloghk.com/101dv4328.html
805	adidas	UNISEX ADIDAS ORIGINALS U_PATH RUN BLACK	https://eshop.cataloghk.com/108g27636.html
806	adidas	WOMEN ADIDAS ORIGINALS SWIFT RUN W WHITE	https://eshop.cataloghk.com/108d96647.html
807	VANS	LITTLE KIDS VANS OLD SKOOL BLACK AND WHITE CHECKERBOARD	https://eshop.cataloghk.com/105vn000ex8bw.html
808	Converse	BIG KIDS CONVERSE STAR COURT 2V OX WHITE	https://eshop.cataloghk.com/150762864c.html
809	VANS	UNISEX VANS STYLE 36 DECON SF	https://eshop.cataloghk.com/105vn0a3mlqc5.html
810	Converse	UNISEX CONVERSE CHUCK 70 HI	https://eshop.cataloghk.com/150162052c.html
811	adidas	MEN ADIDAS ORIGINALS STAN SMITH CF WHITE	https://eshop.cataloghk.com/108s75187.html
	Jason Markk	JASON MARKK ESSENTIAL KIT	https://eshop.cataloghk.com/3ja003500.html H



VOLUME - VELOCITY - VARIETY - VERACITY

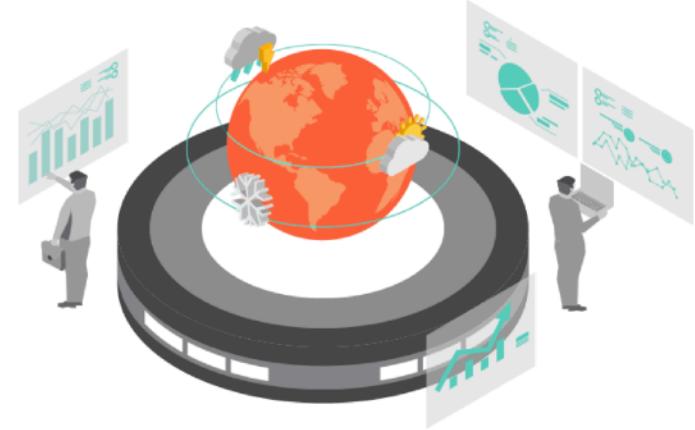
API Demonstration (in JSON format)

OpenWeather global services

Weather forecasts, nowcasts and history in fast and elegant way

2 Billion Forecasts Per Day
2,500 new subscribers a day

2,600,000 customers
20+ weather APIs



Search city

Search



Different Weather?

Metric: °C, m/s

Imperial: °F, mph

3:39pm, Sep 12

London, GB



<https://openweathermap.org/>



Weather in your city

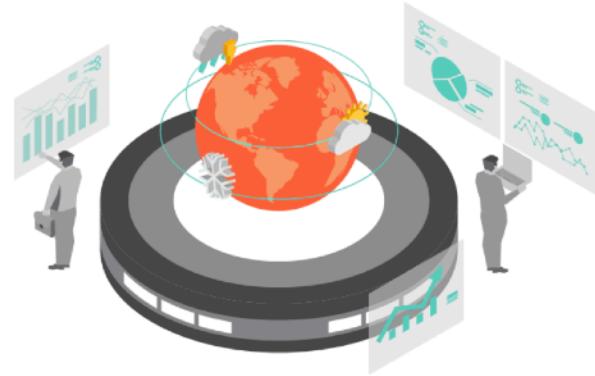
Get Started API Pricing Maps FAQ Partners Blog Marketplace Sign in Support

OpenWeather global services

Weather forecasts, nowcasts and history in fast and elegant way

2 Billion Forecasts Per Day
2,500 new subscribers a day

2,600,000 customers
20+ weather APIs



Search city

Search



Different Weather?

Metric: °C, m/s

Imperial: °F, mph

3:39pm, Sep 12

London, GB

21°C





Weather in your city

Get Started API Pricing Maps FAQ Partners Blog Marketplace support ▾ Support

By city name

Description:

You can call by city name or city name, state code and country code. API responds with a list of weather parameters that match a search request.

API call:

`api.openweathermap.org/data/2.5/weather?q={city name}&appid={your api key}`

`api.openweathermap.org/data/2.5/weather?q={city name},{state code}&appid={your api key}`

`api.openweathermap.org/data/2.5/weather?q={city name},{state code},{country code}&appid={your api key}`

Parameters:

q city name, state code and country code divided by comma, use ISO 3166 country codes. You can specify the parameter not only in English. In this case, the API response should be returned in the same language as the language of requested location name if the location is in our predefined list of more than 200,000 locations.

Examples of API calls:

`api.openweathermap.org/data/2.5/weather?q=London`

`api.openweathermap.org/data/2.5/weather?q=London,uk`

Searching by states available only for the USA locations.

There is a possibility to receive a central district of the city/town with its own parameters

- List of condition codes
- Min/max temperature in current weather API and forecast API
- Other features
 - Format
 - Units format
 - Multilingual support
 - Call back function for JavaScript code

<https://openweathermap.org/current>

← →

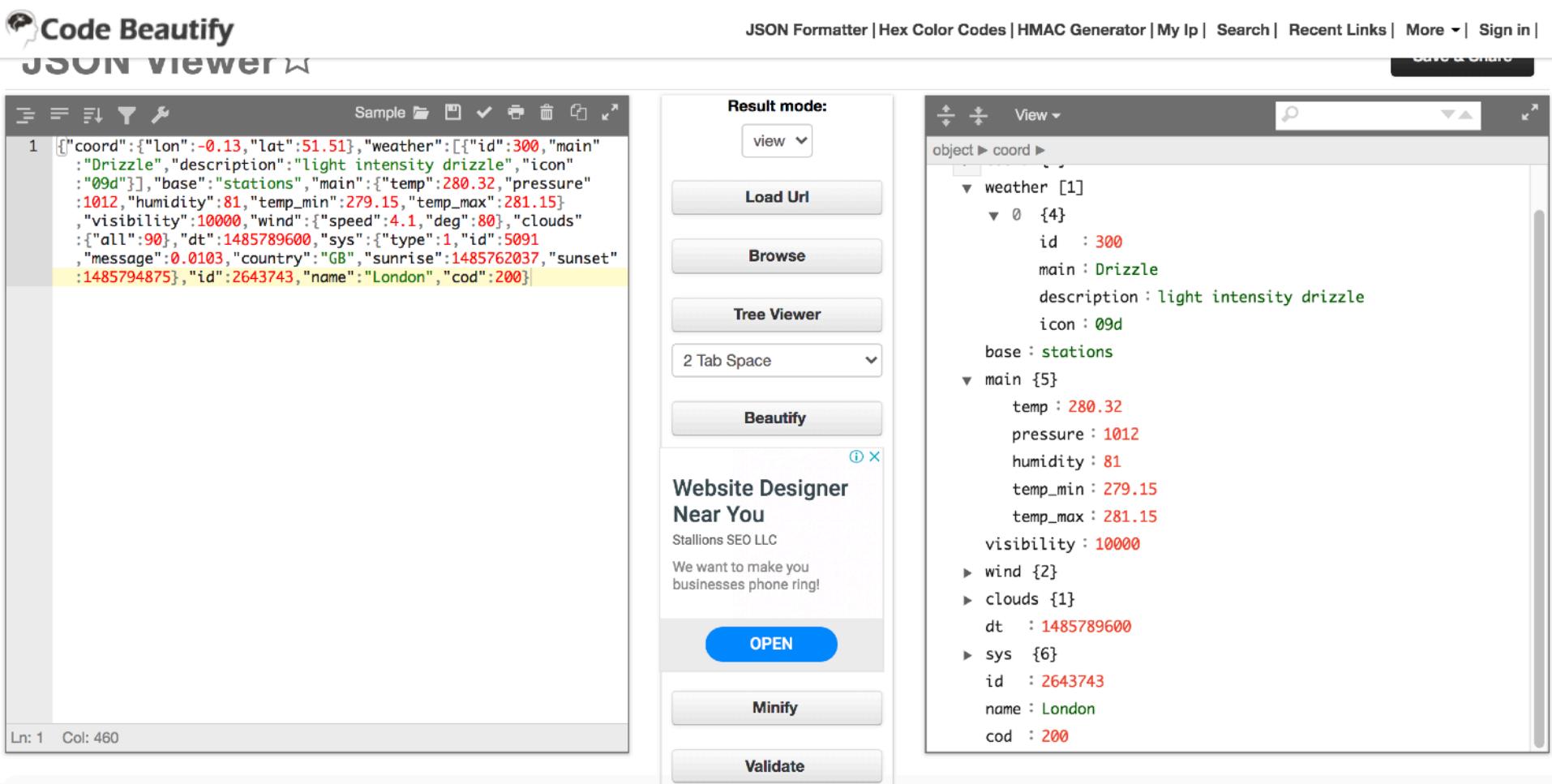
api.openweathermap.org/data/2.5/weather?q=Hong+Kong&appid=234342padfd11323113aadfadafad

Most Visited Getting Started Design Thinking & ... 思潮 AVANT-GARDE... Create Interactive c... hkdc_dt_event phot...

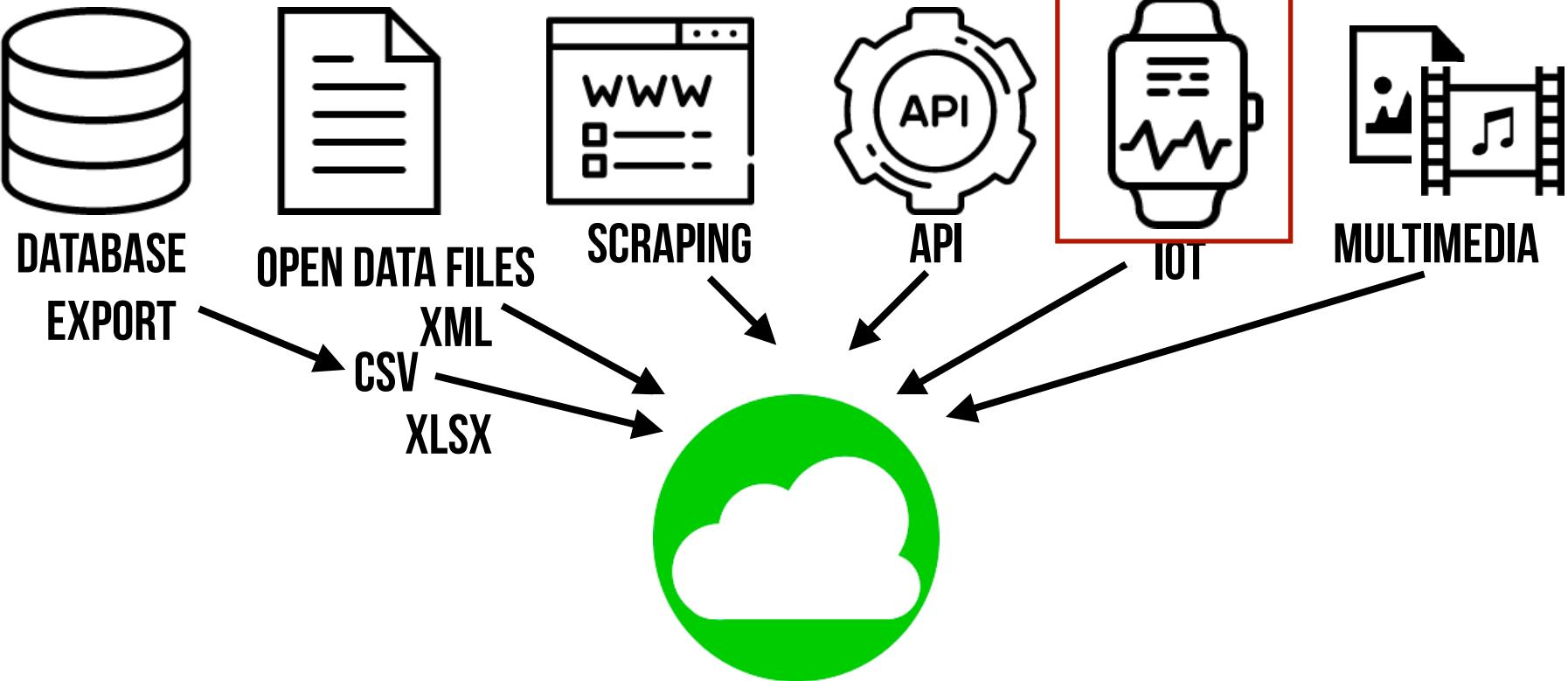
JSON Raw Data Headers

Save Copy Collapse All Expand All Filter JSON

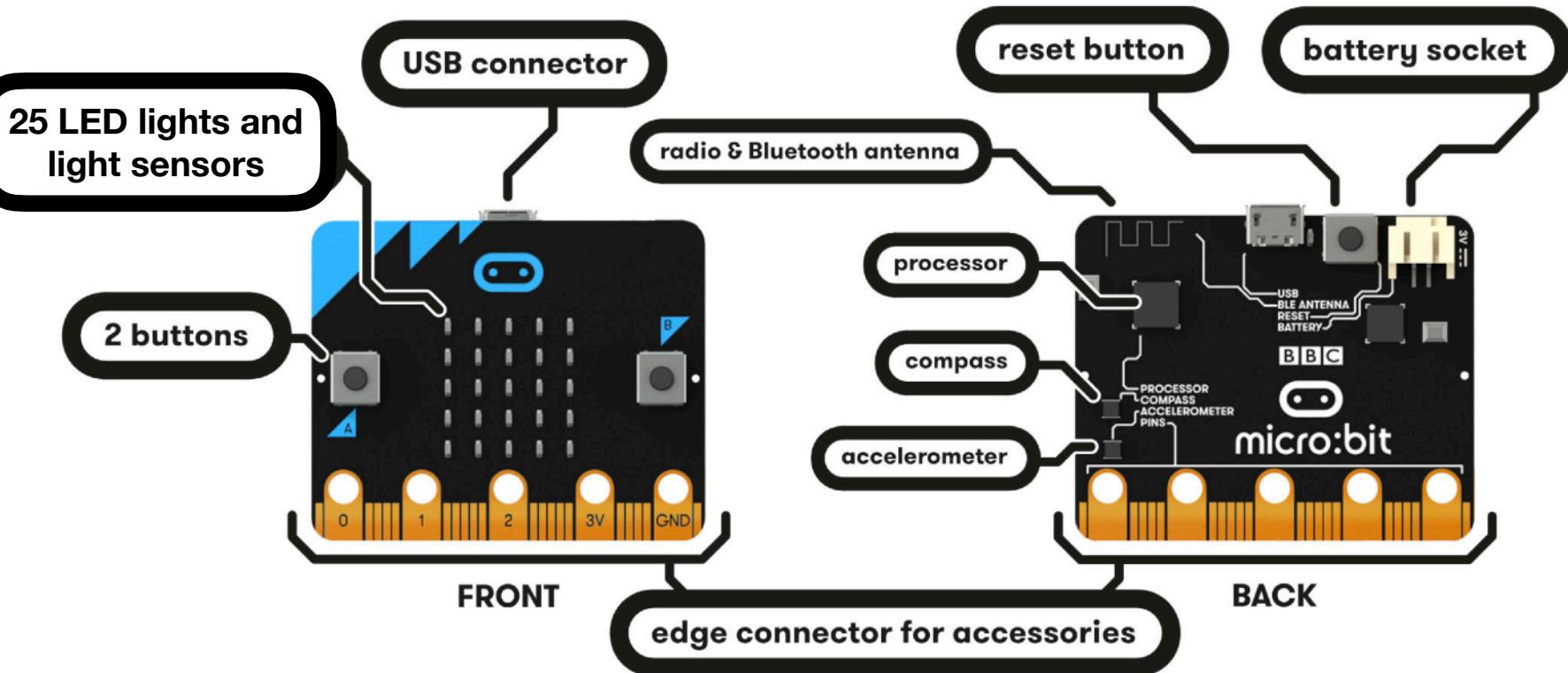
```
coord:
  lon: 114.1577
  lat: 22.2855
weather:
  0:
    id: 803
    main: "Clouds"
    description: "broken clouds"
    icon: "04n"
    base: "stations"
main:
  temp: 15.36
  feels_like: 15.36
  temp_min: 10
  temp_max: 16.67
  pressure: 1019
  humidity: 75
  visibility: 10000
wind:
  speed: 0.45
  deg: 350
  gust: 1.34
clouds:
  all: 83
dt: 1611064432
sys:
  type: 3
  id: 2035800
  country: "HK"
  sunrise: 1611011097
  sunset: 1611050563
  timezone: 28800
  id: 1819729
  name: "Hong Kong"
  cod: 200
```



<https://codebeautify.org/jsonviewer>



VOLUME - VELOCITY - VARIETY - VERACITY



Basic Structure & Components of Micro:bit

source: <https://microbit.org/guide/features>

The Basic Package

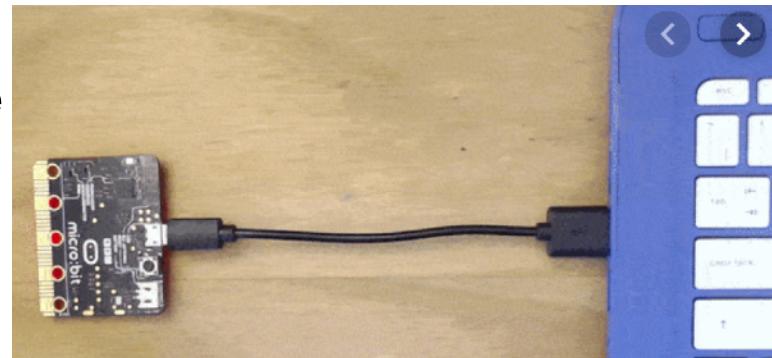
source: <https://geekworm.com>



Connecting a Micro:bit to the Computer via USB

For the newer Macintosh laptop,
we need a USB-C connector.

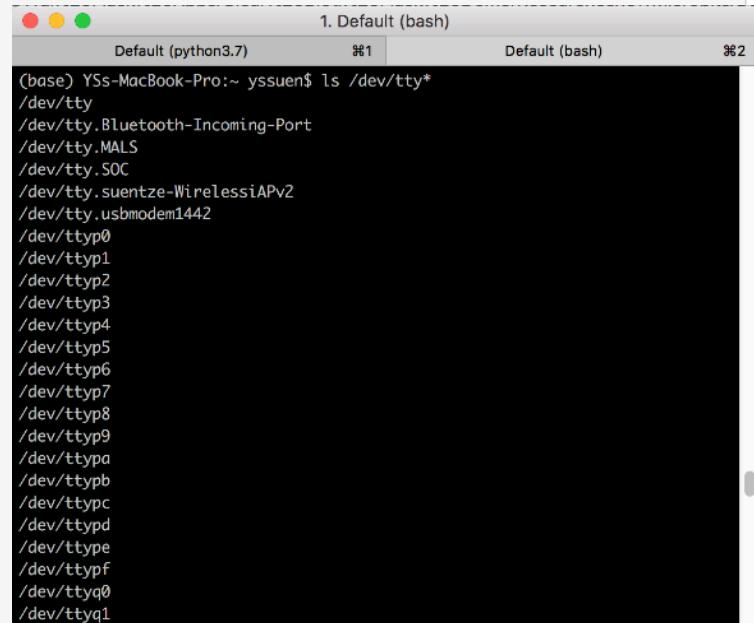
source: <https://support.microbit.org>



In [1]:

```
1 # !pip3 install pyserial
2 # Obtain serial/usb port information by issuing the "ls /dev/*" command
3 # Get Temperature
4 from flask import Flask
5 import logging
6 from logging import FileHandler, WARNING
7 import serial, time
8 from log_model import *
9
10 app = Flask(__name__)
11 file_handler = FileHandler('errorlog.txt')
12 file_handler.setLevel(WARNING)
13 app.logger.addHandler(file_handler)
14 port = "/dev/tty.usbmodem1442"
15 baud = 115200
16 s = serial.Serial(port)
17 s.baudrate = baud
18
19 while True:
20     data = s.readline()
21     data = int(data[0:4])
22     print(data)
23     log_entry = Logs(lightLevel=data,timeStamp=datetime.now())
24     db.session.add(log_entry)
25     db.session.commit()
26     time.sleep(1)
```

```
6
5
5
7
10
1
4
6
```



The screenshot shows a terminal window titled '1. Default (bash)' with the following command and its output:

```
(base) YSs-MacBook-Pro:~ yssuen$ ls /dev/tty*
/dev/tty
/dev/tty.Bluetooth-Incoming-Port
/dev/tty.MALS
/dev/tty.SOC
/dev/tty.suentze-WirelessiAPv2
/dev/tty.usbmodem1442
/dev/ttyp0
/dev/ttyp1
/dev/ttyp2
/dev/ttyp3
/dev/ttyp4
/dev/ttyp5
/dev/ttyp6
/dev/ttyp7
/dev/ttyp8
/dev/ttyp9
/dev/ttypa
/dev/ttypb
/dev/ttypc
/dev/ttypd
/dev/ttypf
/dev/ttyp0
/dev/ttyp1
```

Server: localhost:3306 » Database: abc » Table: logs

Browse Structure SQL Search Insert Export Import Privileges Operations Triggers

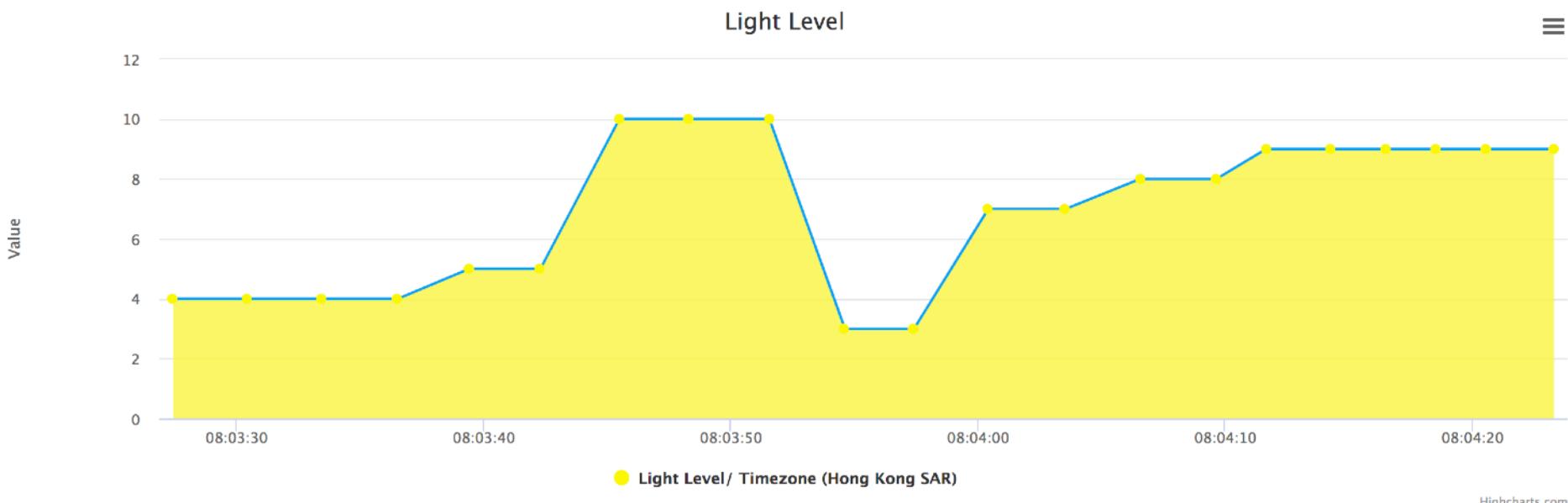
Number of rows: 25 Filter rows: Search this table Sort by key: None

+ Options

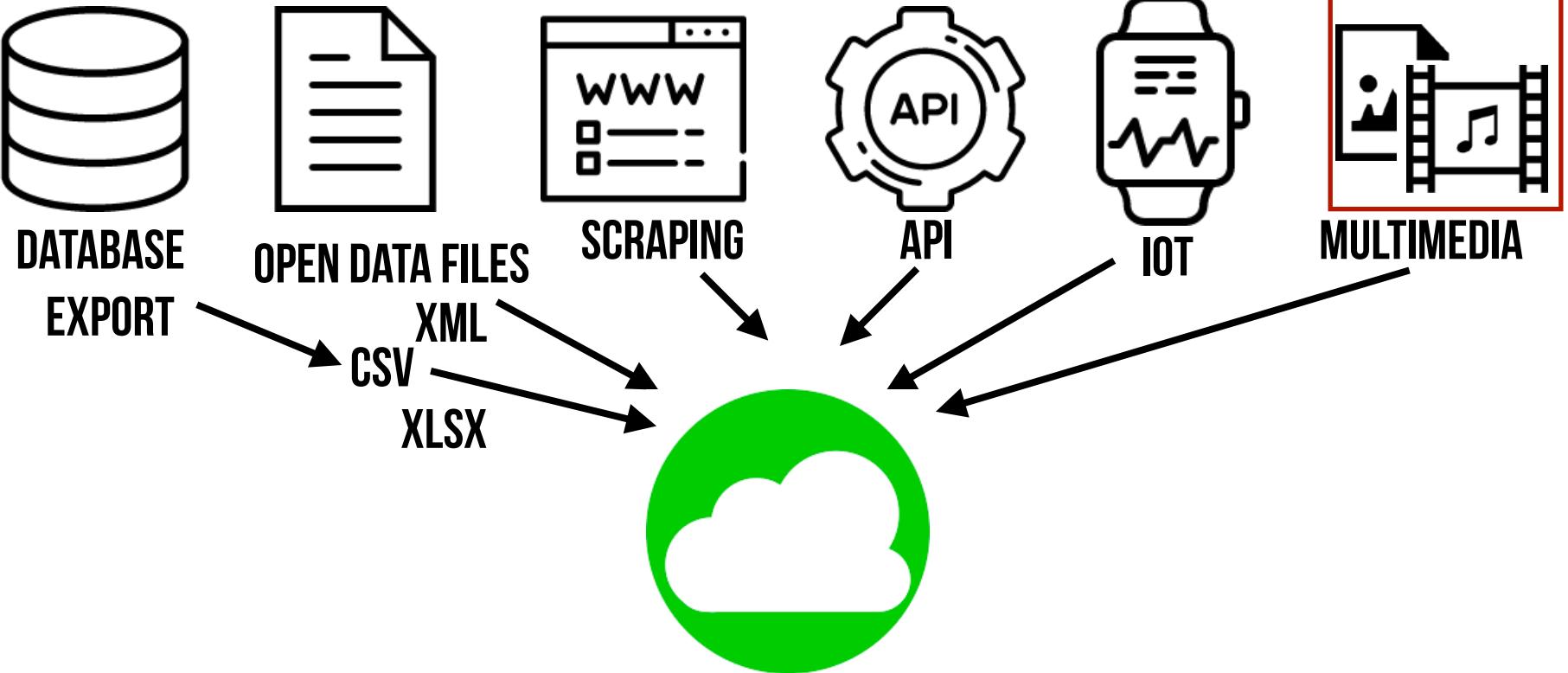
				logtID	lightLevel	timeStamp
<input type="checkbox"/>		Edit		15181	4	2020-09-11 22:55:24
<input type="checkbox"/>		Edit		15182	5	2020-09-11 22:55:30
<input type="checkbox"/>		Edit		15183	4	2020-09-11 22:55:36
<input type="checkbox"/>		Edit		15184	7	2020-09-11 22:55:42
<input type="checkbox"/>		Edit		15185	5	2020-09-11 22:55:48
<input type="checkbox"/>		Edit		15186	7	2020-09-11 22:55:54
<input type="checkbox"/>		Edit		15187	7	2020-09-11 22:56:00
<input type="checkbox"/>		Edit		15188	5	2020-09-11 22:56:06
<input type="checkbox"/>		Edit		15189	9	2020-09-11 22:56:12
<input type="checkbox"/>		Edit		15190	4	2020-09-12 19:50:56
<input type="checkbox"/>		Edit		15191	9	2020-09-12 19:51:02
<input type="checkbox"/>		Edit		15192	10	2020-09-12 19:51:08
<input type="checkbox"/>		Edit		15193	3	2020-09-12 19:51:17
<input type="checkbox"/>		Edit		15194	9	2020-09-12 19:51:23
<input type="checkbox"/>		Edit		15195	9	2020-09-12 19:51:29

Check all With selected: Edit Copy Delete Export

Light Level : 9



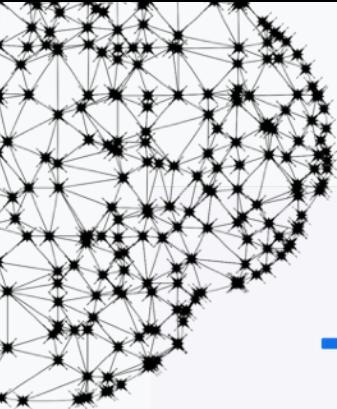
Thanks to [Soumil Nitin Shah](#) and [Peter Kazarinoff](#) for inspiring me to create this Python Flask data logger.



VOLUME - VELOCITY - VARIETY - VERACITY

Image and Voice Recognition and Modelling

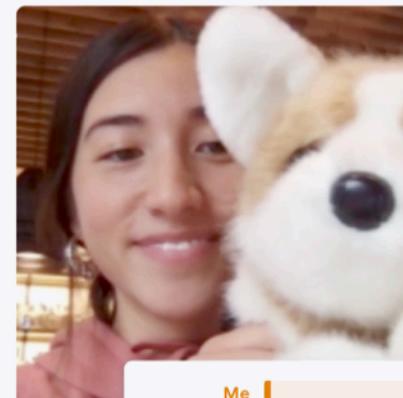
Using Machine/Deep Learning



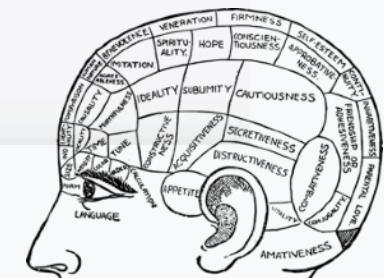
Teachable Machine

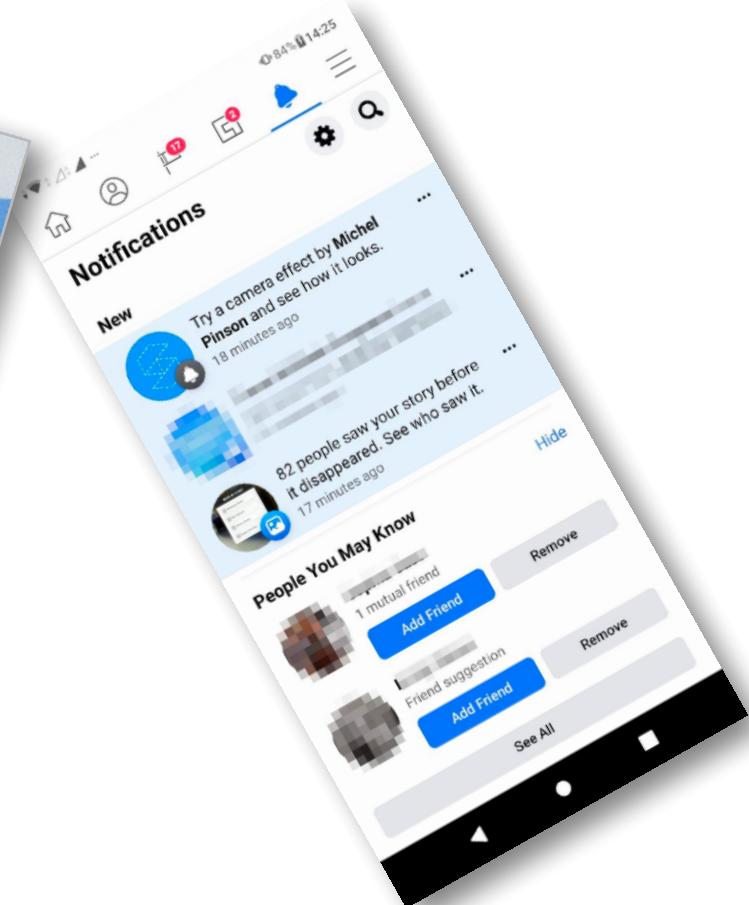
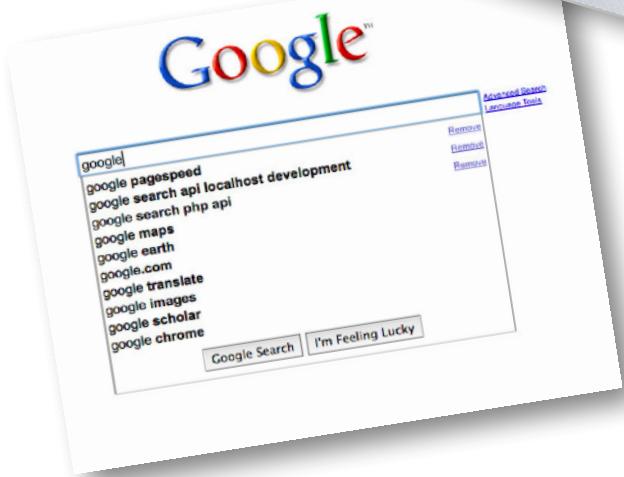
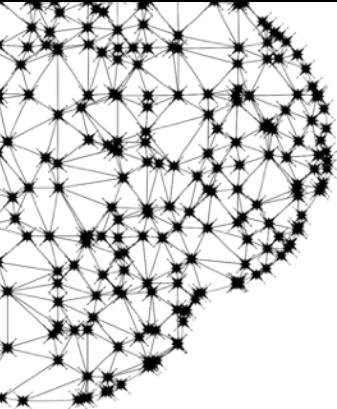
Train a computer to recognize your own images, sounds, & poses.

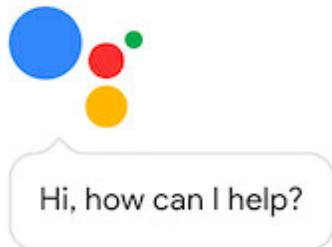
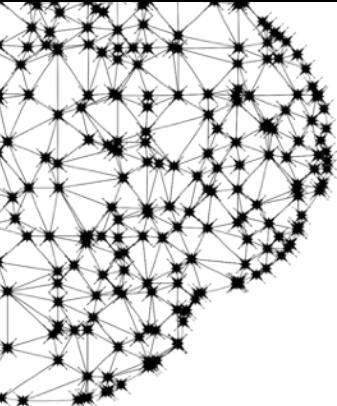
A fast, easy way to create machine learning models for your sites, apps, and more – no expertise or coding required.

[Get Started](#)[About](#) [FAQ](#)[Get Started](#)

Me 
Me + Dog <3 







Meet your Google Assistant.

Ask it questions. Tell it to do things.

It's your own personal Google, always ready to help.



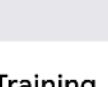
Teachable Machine

Banana 

308 Image Samples

 Webcam

 Upload



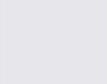
⋮

Apple 

294 Image Samples

 Webcam

 Upload



⋮

+ Add a class

Training

Model Trained

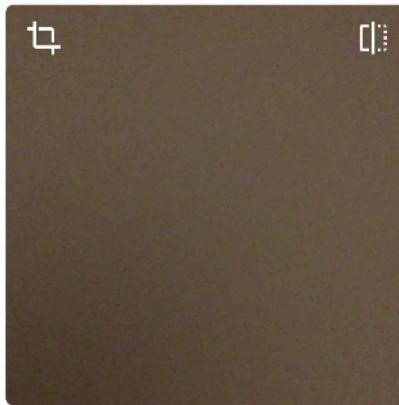
Advanced 

Preview  Export Model

Input

 ON

Webcam 



↓

Output

Banana

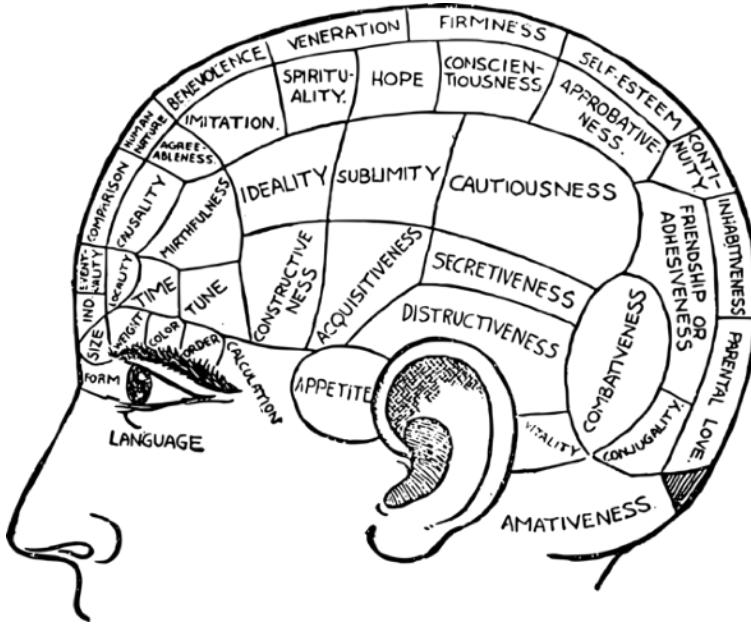
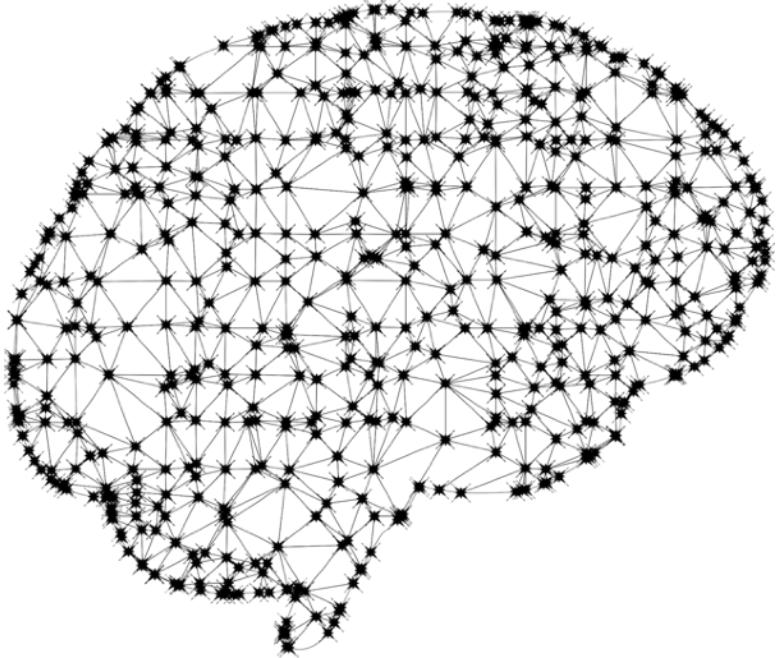
 77%

Apple

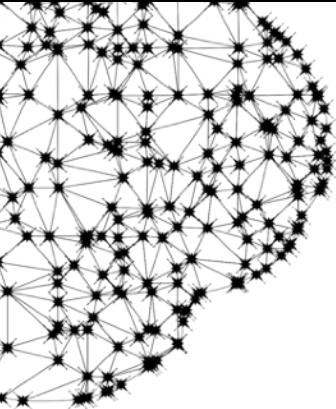
 23%

 English (U.S.) 

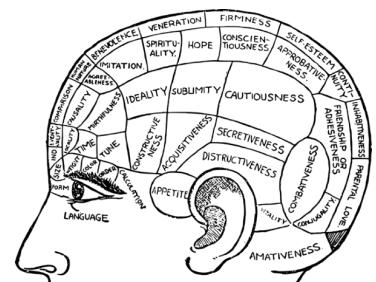
release-2-2-2 - 2.2.2#062770 - 83

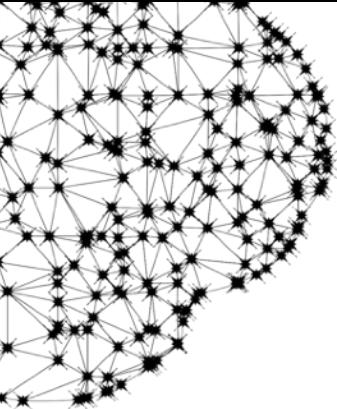


Artificial Intelleigence for Mass Adoption

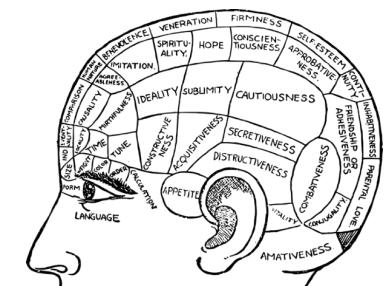


How does the machine perform its “magic”?





Why is there a programming blackbox in Machine Learning?





Output

Too
Early



Ripe

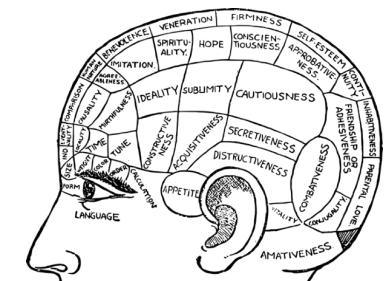
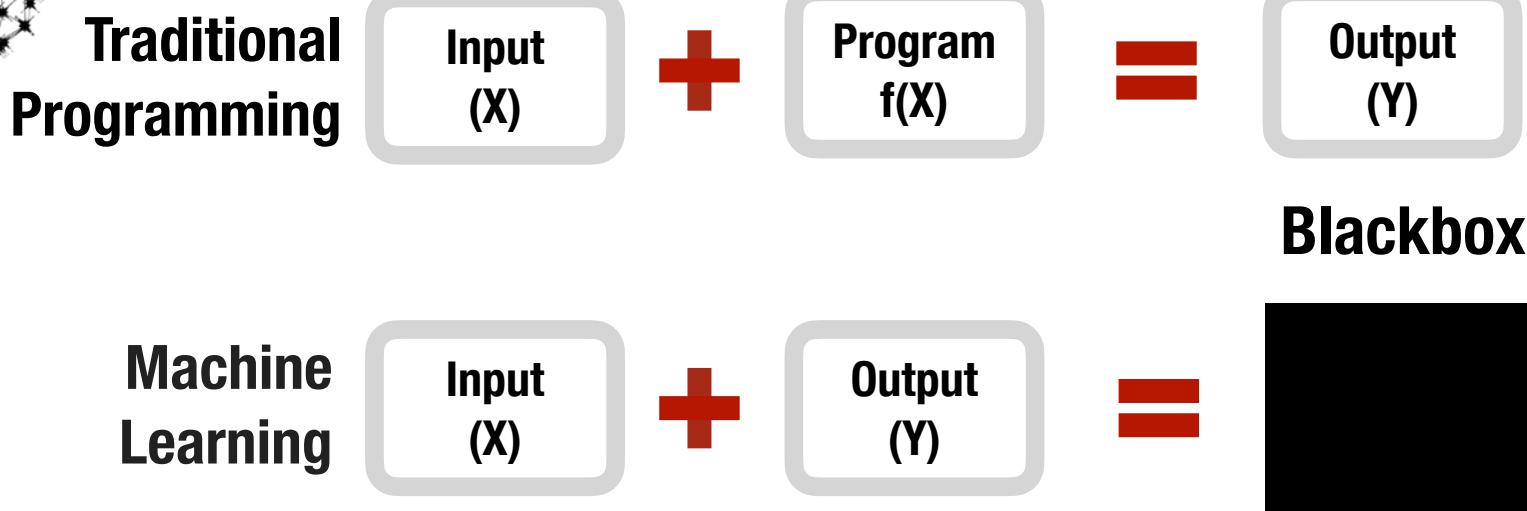


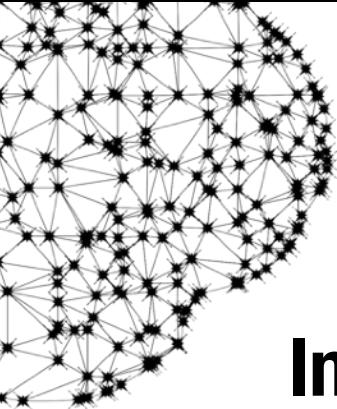
Too Late



No
Banana

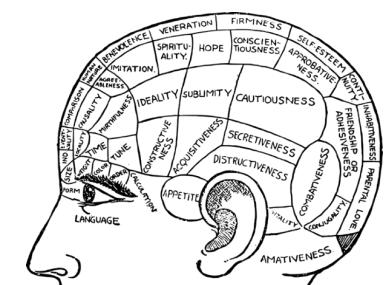


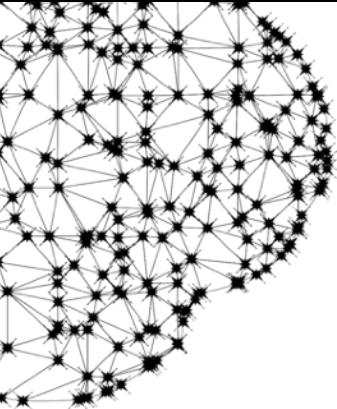




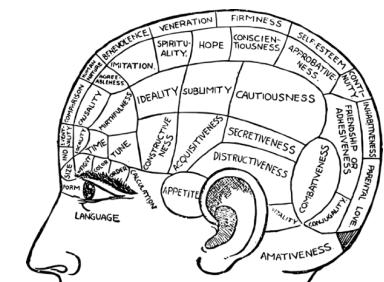
In traditional programming, **human is the
main programmer?**

In Machine Learning, the **computer is the
main programmer?**





Because we **cannot explain in some cases how the computer comes up with its decision. Its computational process becomes a **blackbox** to us.**



Input
輸入 →

Process
運算

→ Output
輸出

事件
Events

偵測
Sensing

控制
Control

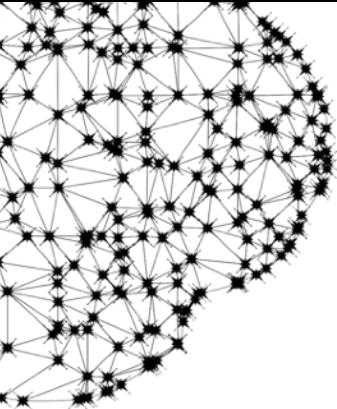
變數
Variables

運算
Operators

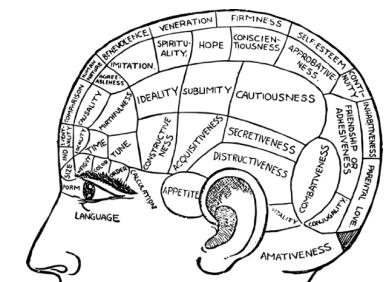
外觀
Looks

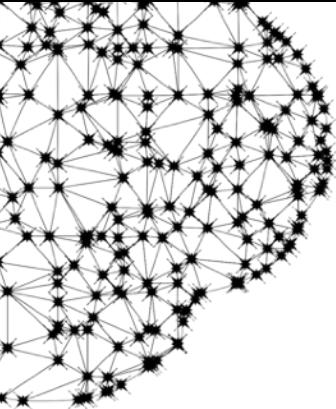
動作
Motion

Blackbox

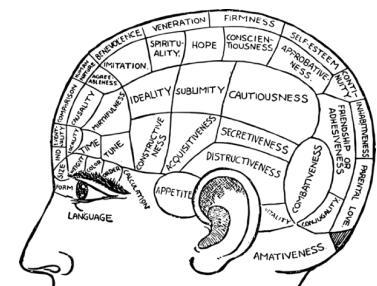


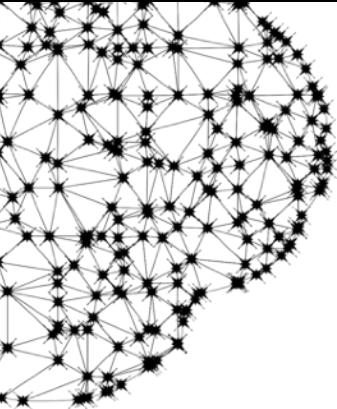
Machine Learning is a kind of Computational Method very different from what we have learned before.





Let's see how it all started.



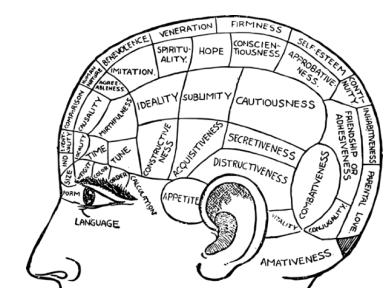


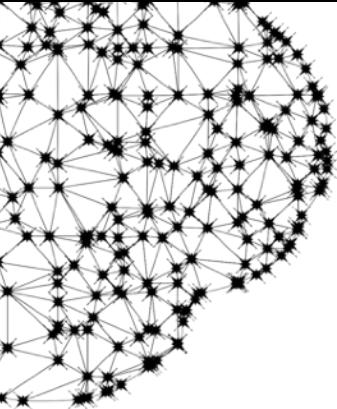
“...to summarize, the discipline of computer science has evolved into the following 15 distinct fields:

1. Algorithms and complexity
2. Architecture and organization
3. Computational science
4. Graphics and visual computing
5. Human-computer interaction
6. Information management
7. Artificial Intelligence
8. Networking and communication
9. Operating systems
10. Parallel and distributed computing
11. Platform-based development
12. Programming languages
13. Security and information assurance
14. Software engineering
15. Social and professional issues

Source: [Encyclopedia Britannica](#)

- Machine Learning
- Neural Network
- Robotics
- Expert Systems
- Data Mining
- Natural Language Processing
- Computer Vision/Speech Recognition
- Knowledge Representation
- Cognitive Computing
- Information Retrieval & Semantic Web

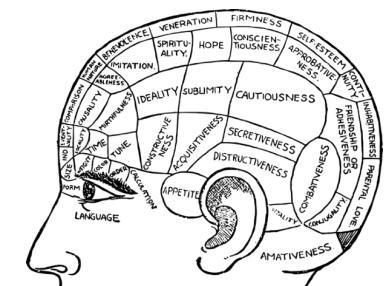
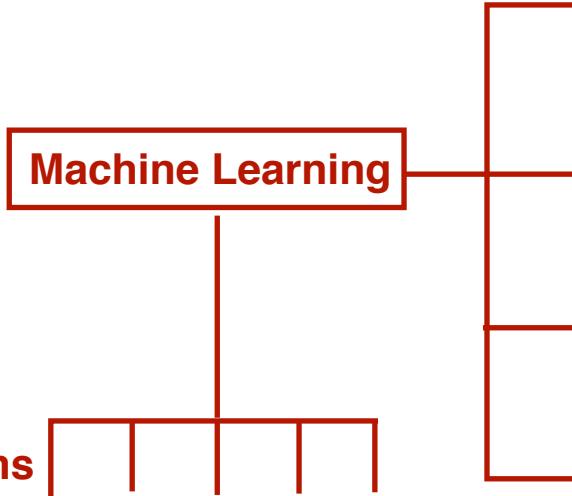


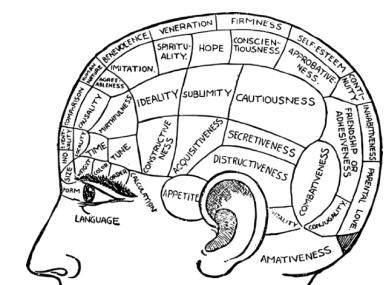
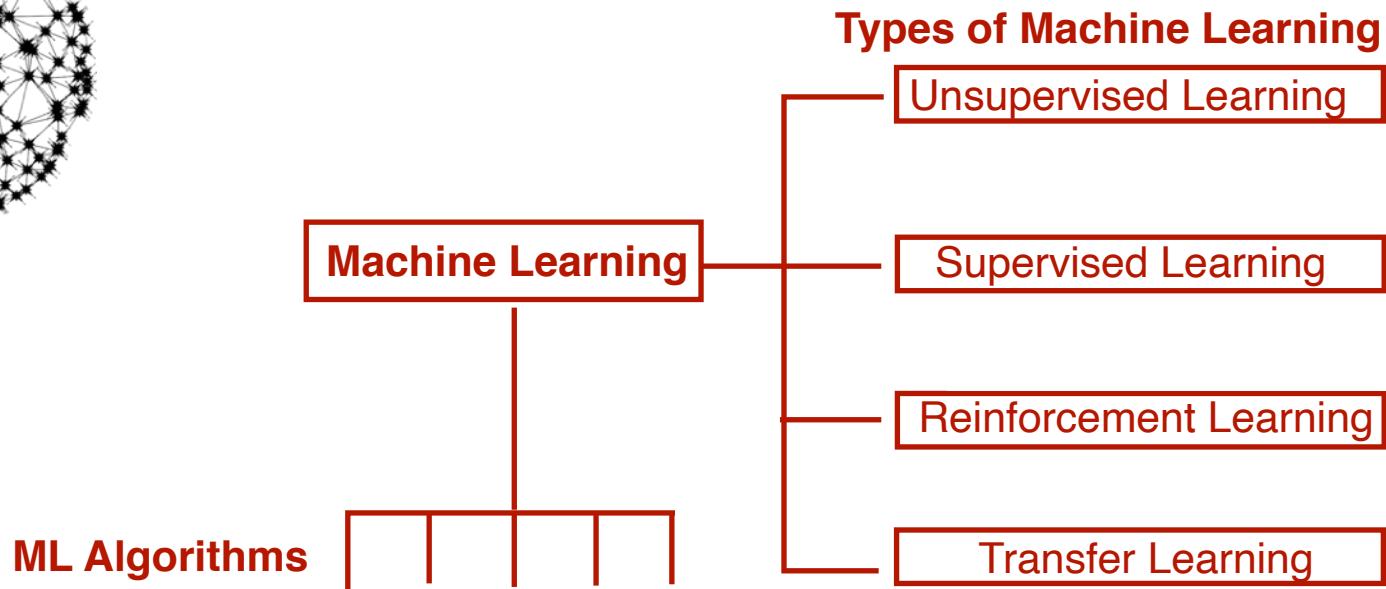


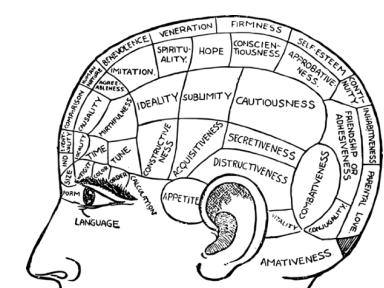
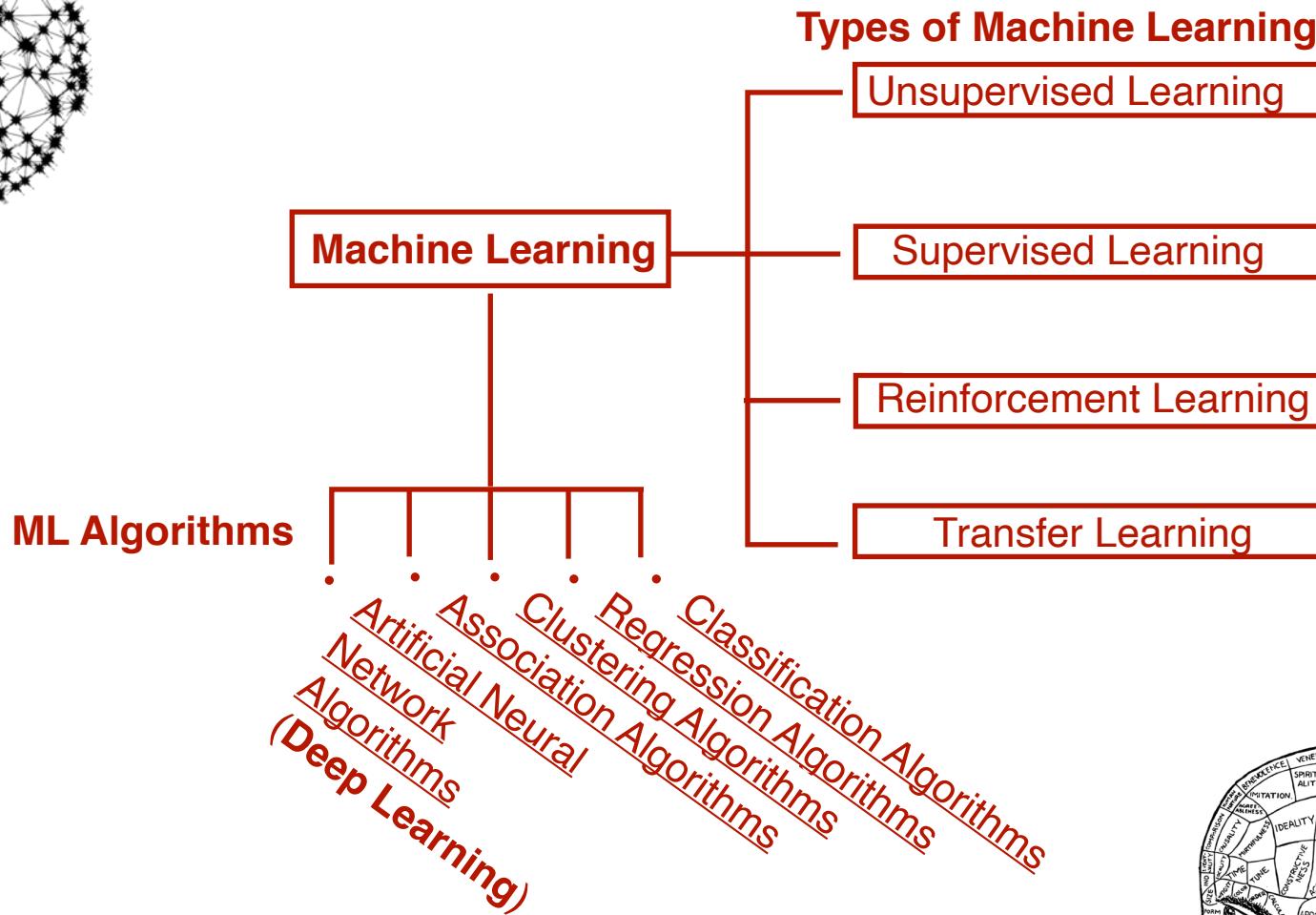
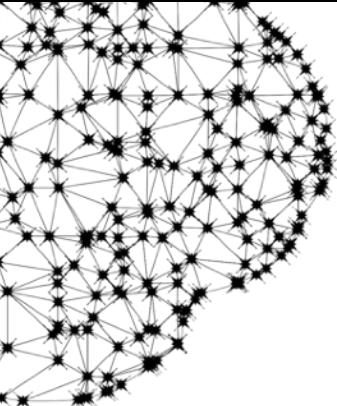
Types of ML Algorithms

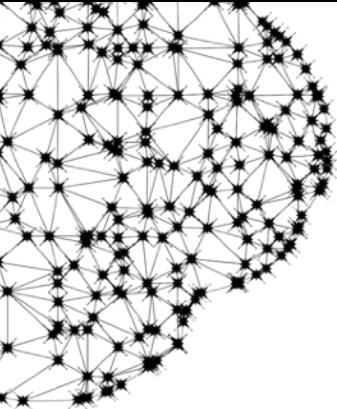
Machine Learning

Types of Machine Learning

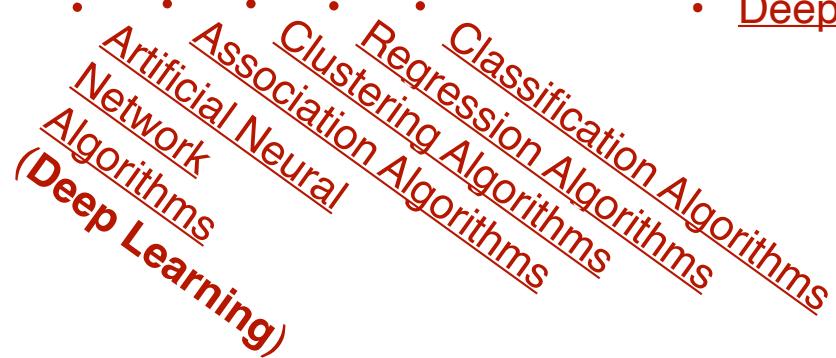








ML Algorithms



Machine Learning

Types of Machine Learning

Unsupervised Learning

- Clustering/Association
- Deep Learning

Supervised Learning

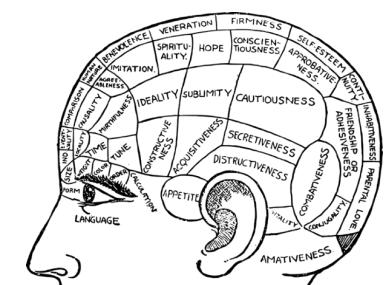
- Classification/Regression
- Deep Learning

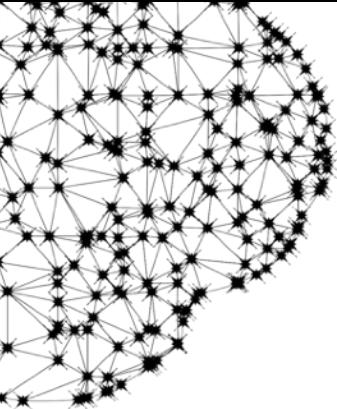
Reinforcement Learning

- Deep Learning

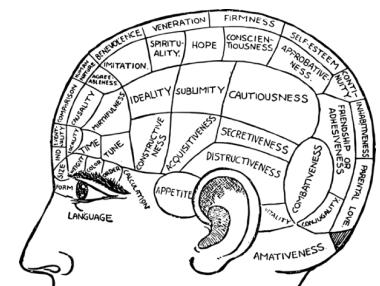
Transfer Learning

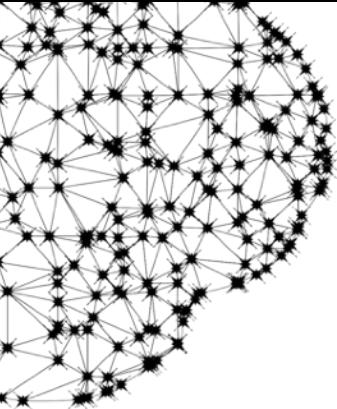
- Deep Learning





When should we use **Unsupervised Learning**?

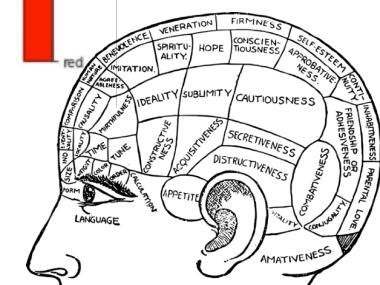
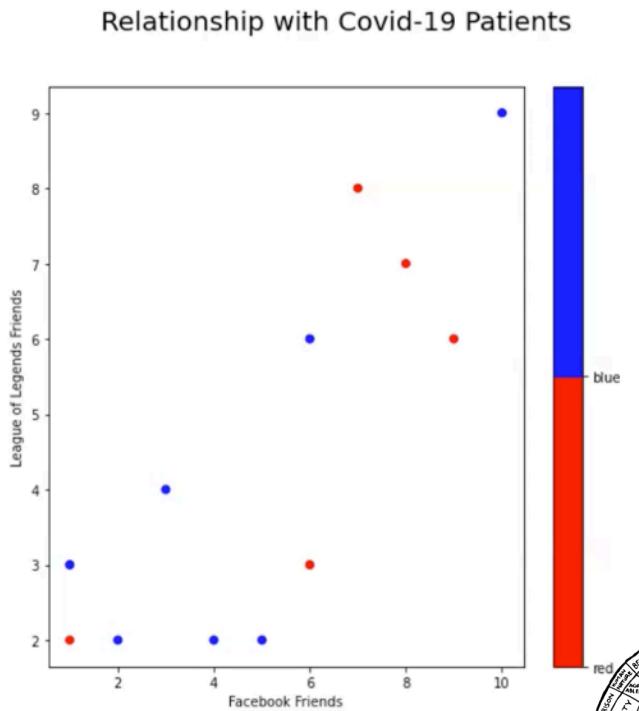


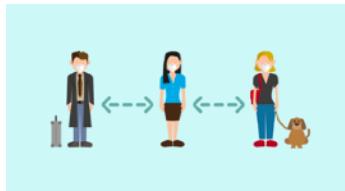
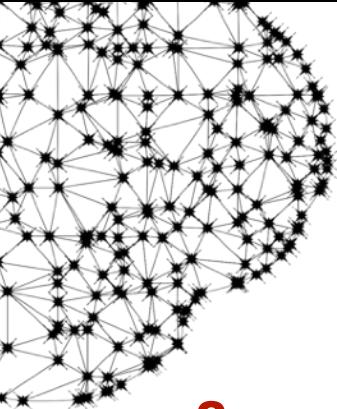


A SIMPLE DATASET

Blue: Uninfected

Red: Infected





LL COVID19+
FB COVID19+

Classification Algorithm

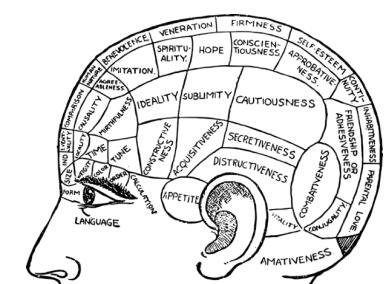
Supervised
Learning

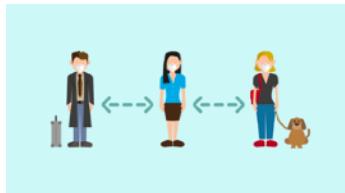
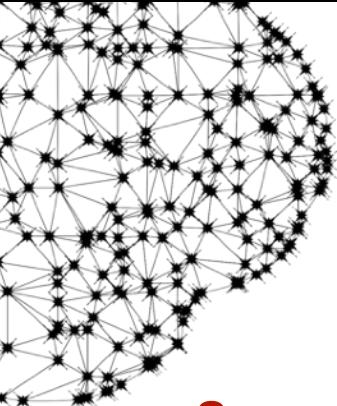


Unsupervised
Learning



Use **distance** from infected LL and FB friends to predict whether one is infected with COVID19.

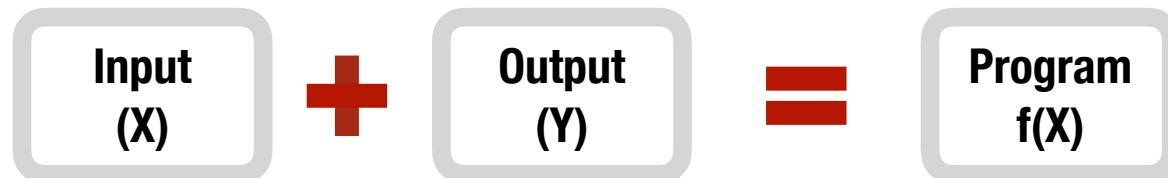




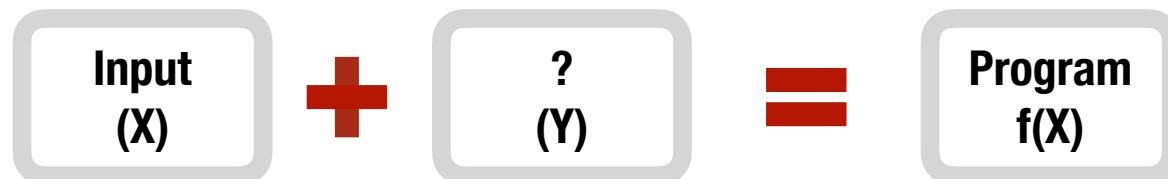
LL COVID19+
FB COVID19+

Classification
Algorithm

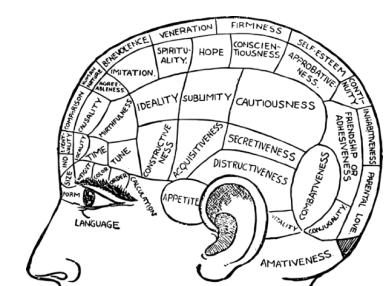
Supervised
Learning

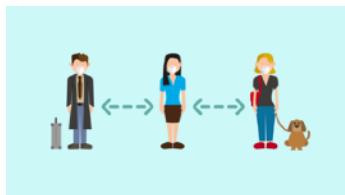
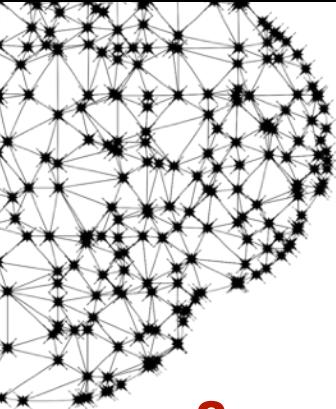


Unsupervised
Learning



But if you did not provide instructions on who was infected (could not label COVID19+ or -), can the program predict whether you're infected or not?





LL COVID19+

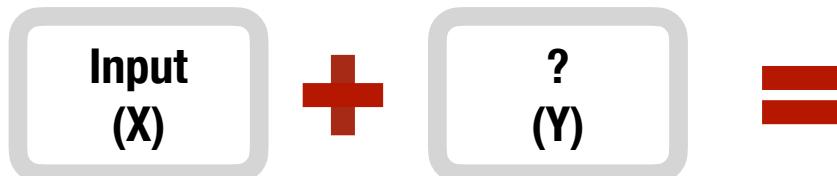
FB COVID19+

Classification Algorithm

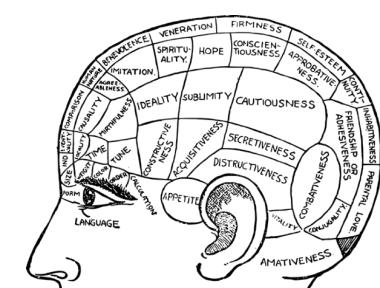
Supervised Learning

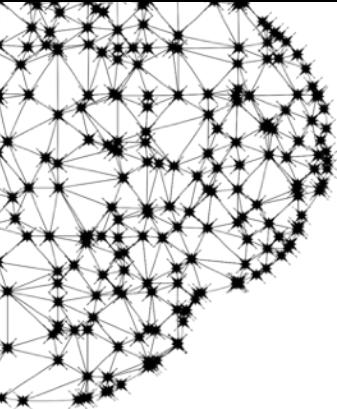


Unsupervised Learning

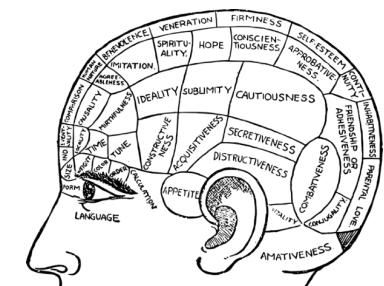


However, the program can at least **cluster** them by interest group, so that once the invisible carrier is identified and the grouping is known, then we can still track down the one who is infected.





When should we use **Supervised Learning**?

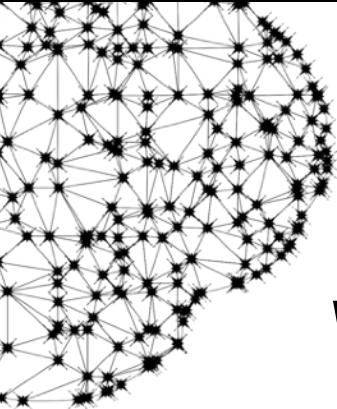


A



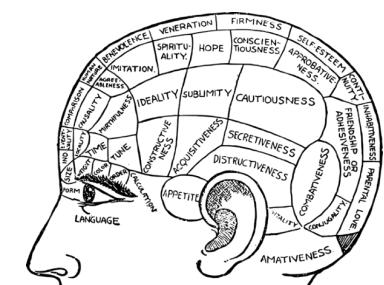
B





When can we use Supervised Learning for predicting outcome?

In the prediction, when to use regression method and when to use classification method?



Business Problem

Predict Outcome

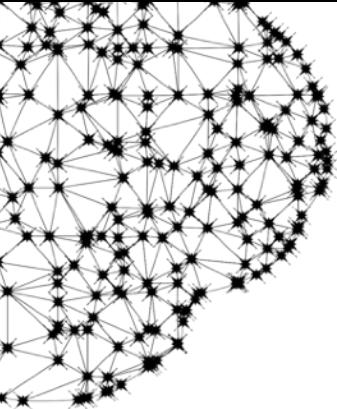
Data
Rich

Data
Poor

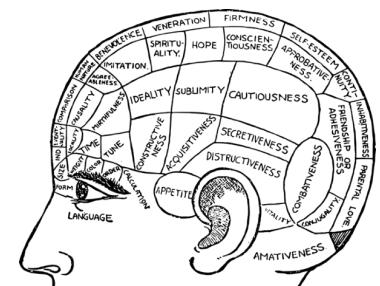
Numeric
(Regression Algorithm)

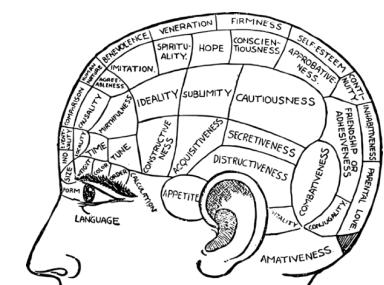
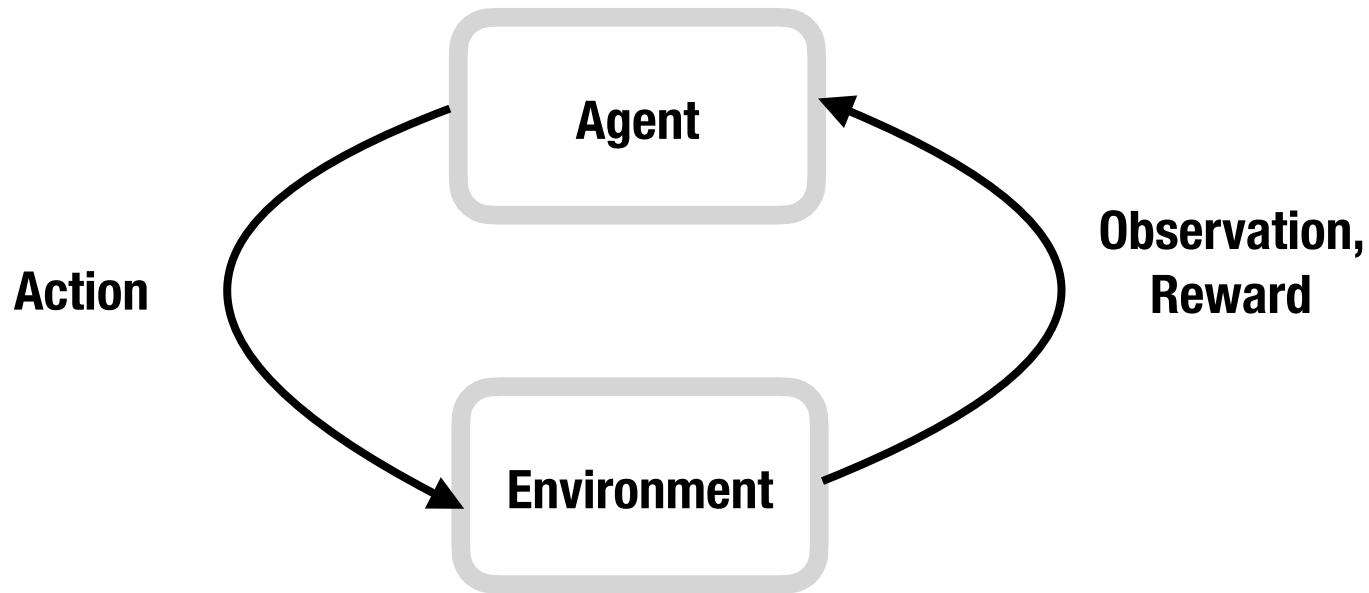
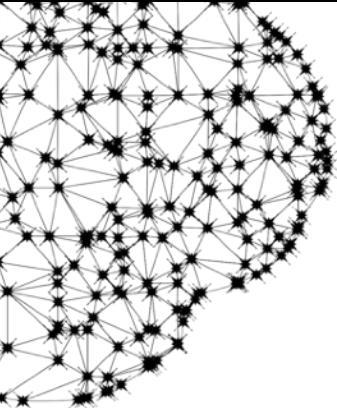
Categorical
(Classification Algorithm)

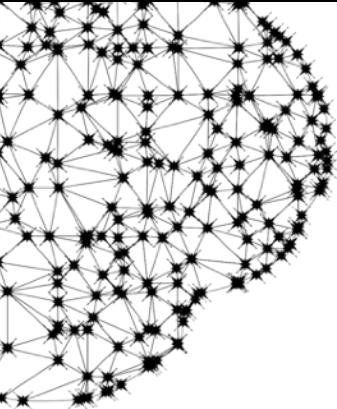
A/B
Test



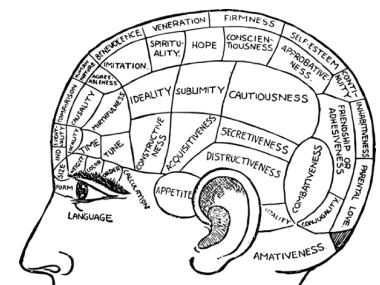
When should we use Reinforcement Learning?

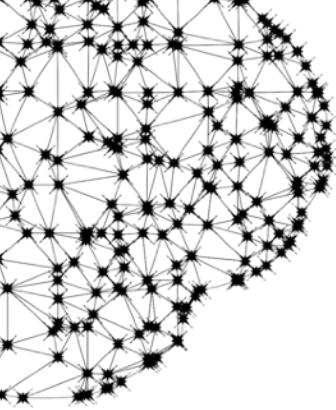


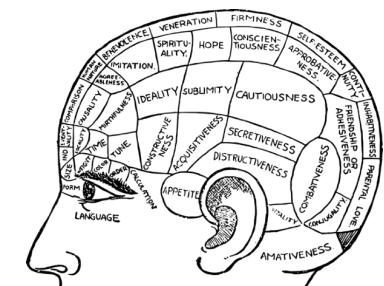


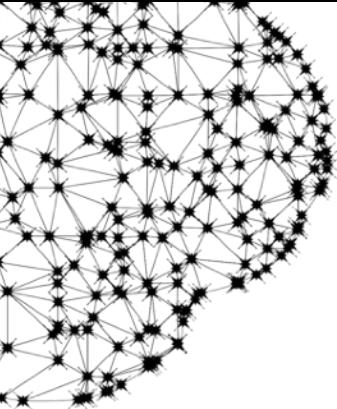


Use of Machine Learning in Industries

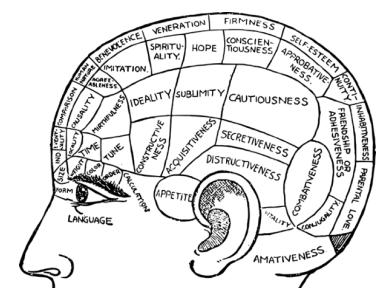


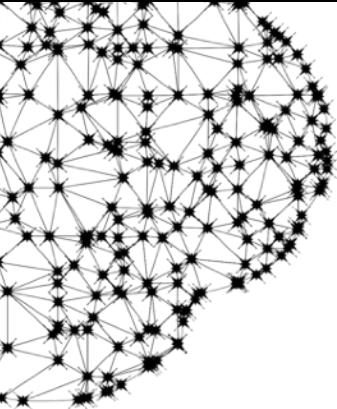
- 
1. Primary Sector (**Agriculture**)
 2. Secondary Sector (**Manufacturing**)
 3. Tertiary Sector (**Service**)
 4. Quaternary sector (**Knowledge/IP**)



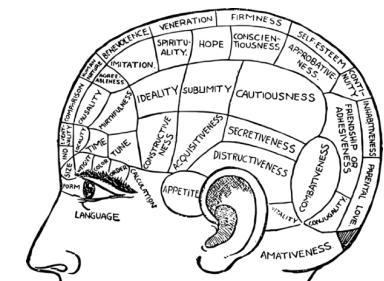


Rapid Growing Fields Using Deep Learning

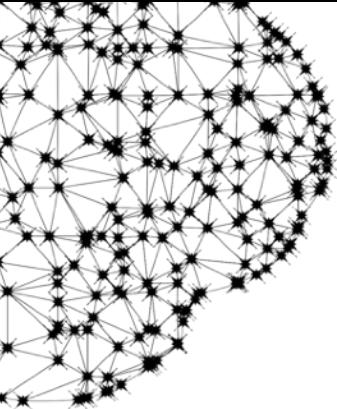




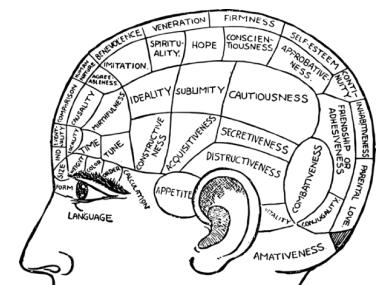
- 1. Computer Vision**
- 2. Speech Recognition**
- 3. Natural Language Processing**
- 4. Facial Recognition**
- 5. Medical Diagnosis**
- 6. Driverless Car**



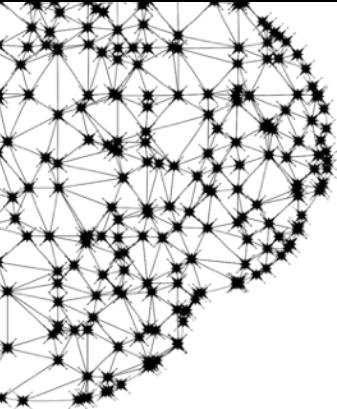




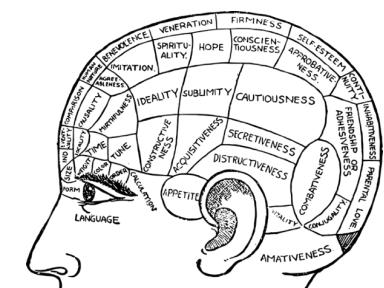
**What kind of ML/DL was/were used
in the video?**

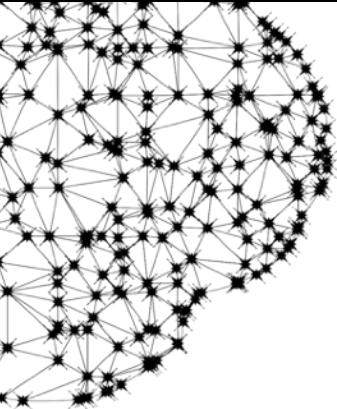




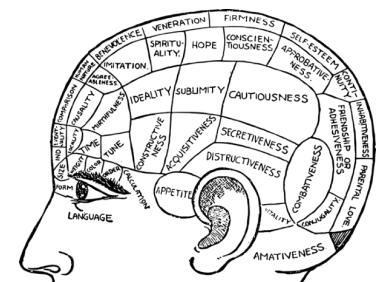


**What kind of ML/DL applications
was/were used in the video?**

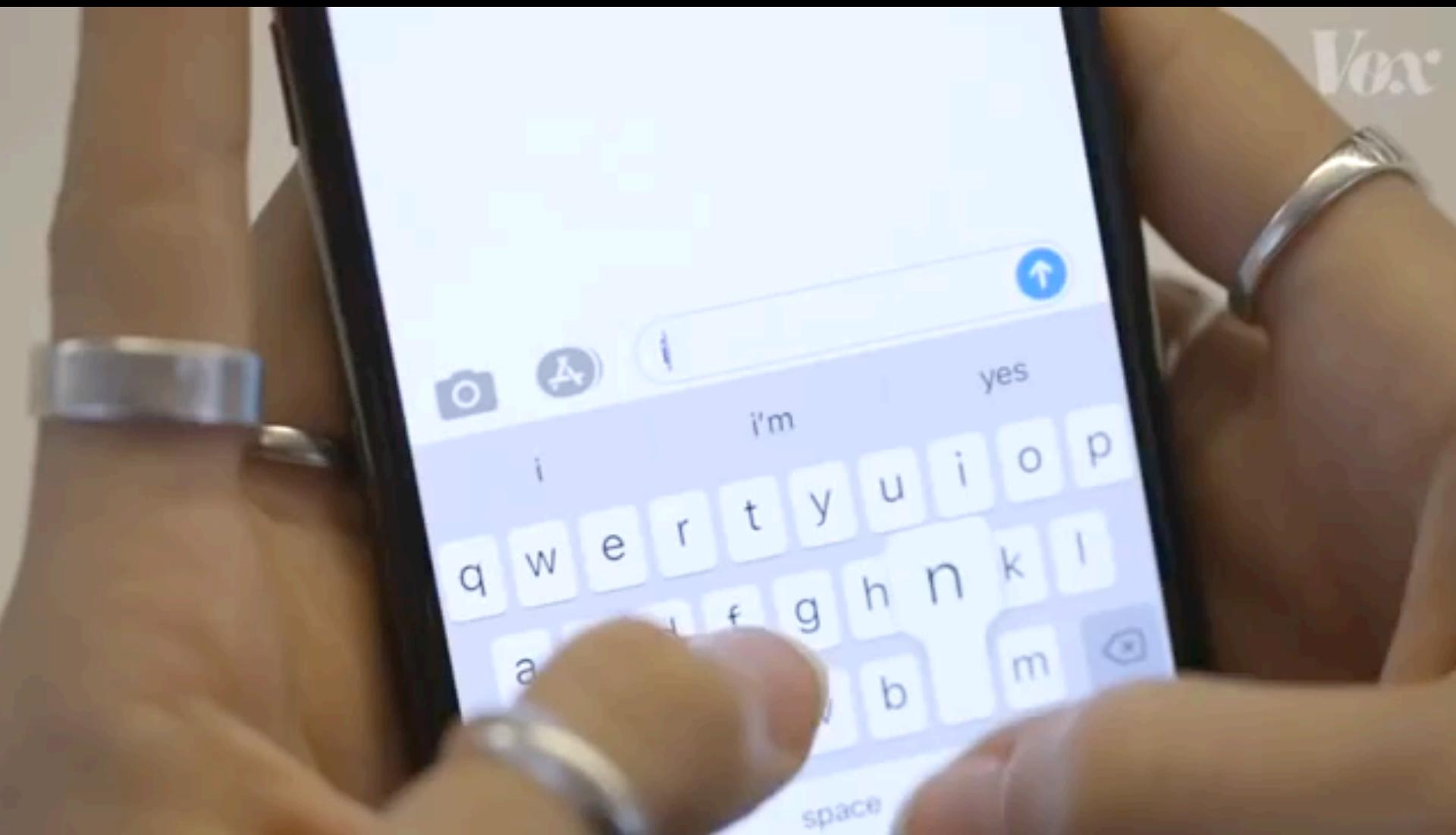


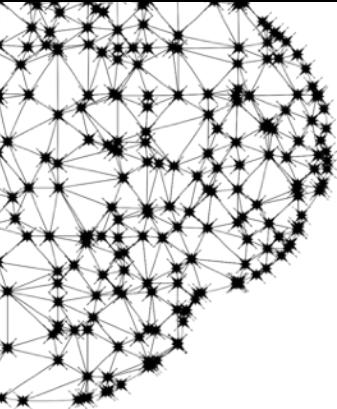


What kind of ML/DL was/were mentioned in the video?

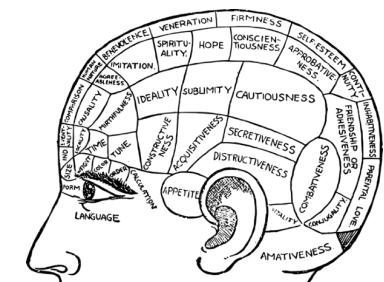


Vox





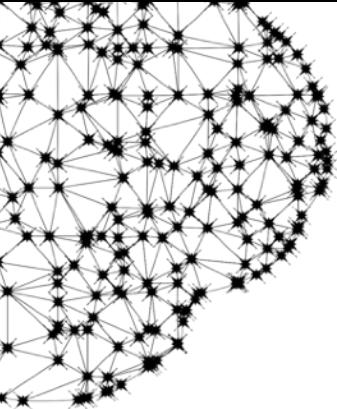
What kind of ML/DL was/were mentioned in the video?



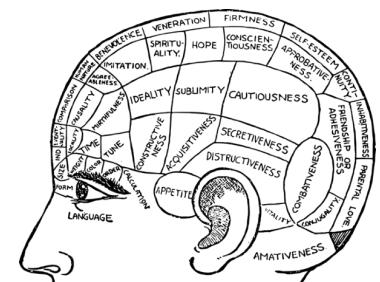
Hong Kong GDP Contribution by Major Sectors

Economic Activity	2014	2015	2016	2017	2018 I
Agriculture, fishing, mining and quarrying	0.1	0.1	0.1	0.1	0.1
Manufacturing	1.3	1.1	1.1	1.1	1.0
Electricity, gas and water supply, and waste management	1.6	1.5	1.4	1.4	1.3
Construction	4.4	4.6	5.2	5.1	4.5
Services	92.7	92.7	92.2	92.4	93.1

Economic Activity	2014	2015	2016	2017	2018 [1]
Services	92.7	92.7	92.2	92.4	93.1
Import/export, wholesale and retail trades	24.1	22.7	21.7	21.5	21.3
<i>Import and export trade</i>	<i>19.1</i>	<i>18.1</i>	<i>17.7</i>	<i>17.5</i>	<i>17.2</i>
<i>Wholesale and retail trades</i>	<i>5.0</i>	<i>4.6</i>	<i>4.1</i>	<i>4.0</i>	<i>4.1</i>
Accommodation and food services ^	3.6	3.4	3.3	3.3	3.4
Transportation, storage, postal and courier services	6.2	6.5	6.2	6.0	5.9
<i>Transportation and storage</i>	<i>5.9</i>	<i>6.1</i>	<i>5.9</i>	<i>5.7</i>	<i>5.5</i>
<i>Postal and courier services</i>	<i>0.3</i>	<i>0.3</i>	<i>0.3</i>	<i>0.3</i>	<i>0.3</i>
Information and communications	3.5	3.5	3.5	3.4	3.4
Financing and insurance	16.7	17.6	17.7	18.8	19.8
Real estate, professional and business services	10.9	10.9	11.0	10.8	10.4
<i>Real estate</i>	<i>5.0</i>	<i>5.0</i>	<i>5.1</i>	<i>5.0</i>	<i>4.6</i>
<i>Professional and business services</i>	<i>5.9</i>	<i>5.9</i>	<i>5.9</i>	<i>5.8</i>	<i>5.8</i>
Public administration, social and personal services	17.2	17.5	18.1	18.2	18.5
Ownership of premises	10.5	10.6	10.7	10.4	10.5



Exercises for Refreshing Our Memory



Machine Learning Program

Input (X)

Intruder Detection

Spam Mail Detection

**Program
 $f(X)$**

Output (Y)

Machine Learning Program

Input (X)

**Program
 $f(X)$**

Output (Y)

Intruder Detection

Sensor

**Regression/
Classification**

**Failure Freq/
Alarm Yes/No**

Spam Mail Detection

Machine Learning Program

Input (X)

**Program
 $f(X)$**

Output (Y)

Intruder Detection

Sensor

**Regression/
Classification**

**Failure Freq/
Alarm Yes/No**

Spam Mail Detection

Mail

**Classifi-
cation**

**Spam or
Not-Spam**

Machine Learning Program

COVID-19 Diagnosis

Car Insurance Underwriting

Input (X)

**Program
 $f(X)$**

Output (Y)

Machine Learning Program

Input (X)

Program
 $f(X)$

Output (Y)

COVID-19 Diagnosis

Patient Synopsis

Classifier

Positive or Negative

Car Insurance Underwriting

Machine Learning Program

Input (X)

Program
 $f(X)$

Output (Y)

COVID-19 Diagnosis

Patient Synopsis

Classifier

Positive or Negative

Car Insurance Underwriting

Accident Details

Regression

Insurance Amount

Machine Learning Program

Input (X)

Recommend Movies

Robocon Competition

Program
 $f(X)$

Output (Y)

Machine Learning Program

Input (X)

Program
 $f(X)$

Output (Y)

Recommend Movies

Movie Viewing

Association

Robocon Competition

Recommendation

Machine Learning Program

Input (X)

Program
 $f(X)$

Output (Y)

Recommend Movies

Movie Viewing

Association

Recommendation

Robocon Competition

Moves & Results

Reinforcement

Action to Score

- Images
- Audio
- Video
- Texts, Numbers
- Gestures

Features Extraction

- Color
- Texture
- Size
- Sound
- Categories

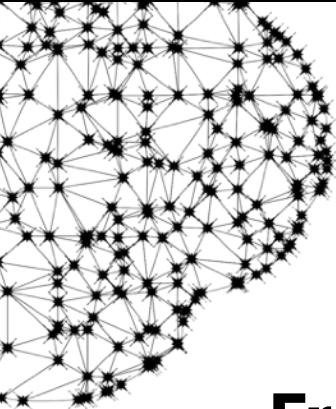
Vectors
[0,1,2,0,4]
[3,2,4,5,6]
[9,2,6,8,3]
[0,3,7,1,4]

Data (X)

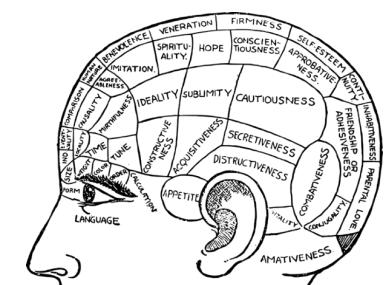
ML
 $f(X)$

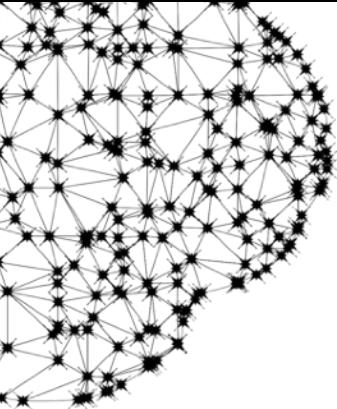
Outcome
(Y)

- ## Outcome
- Classification
 - Regression
 - Associations
 - Clusters

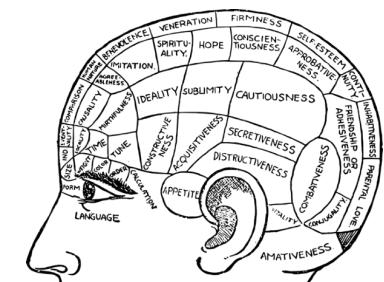


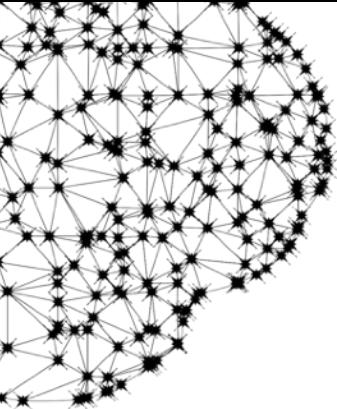
From the previous tables, which **sector(s) and **industries** in which ML/DL can create tremendous values in Hong Kong? What will job opportunities lie?**



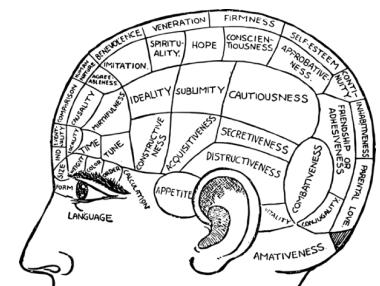


Will AI take jobs away from us? How can we equip ourselves for the challenge?





To work with Machine Learning, **data** is the **key**.





DATA

Data Scientist: The Sexiest Job of the 21st Century

by Thomas H. Davenport and D.J. Patil

From the October 2012 Issue

<https://hbr.org/2012/10/data-scientist-the-sexiest-job-of-the-21st-century>



ANALYTICS

What Data Scientists Really Do, According to 35 Data Scientists

by Hugo Bowne-Anderson

August 15, 2018

[Summary](#) [Save](#) [Share](#) [Comment 8](#) [Print](#) **\$8.95** Buy Copies



https://hbr.org/2018/08/what-data-scientists-really-do-according-to-35-data-scientists?referral=03758&cm_vc=rr_item_page.top_right

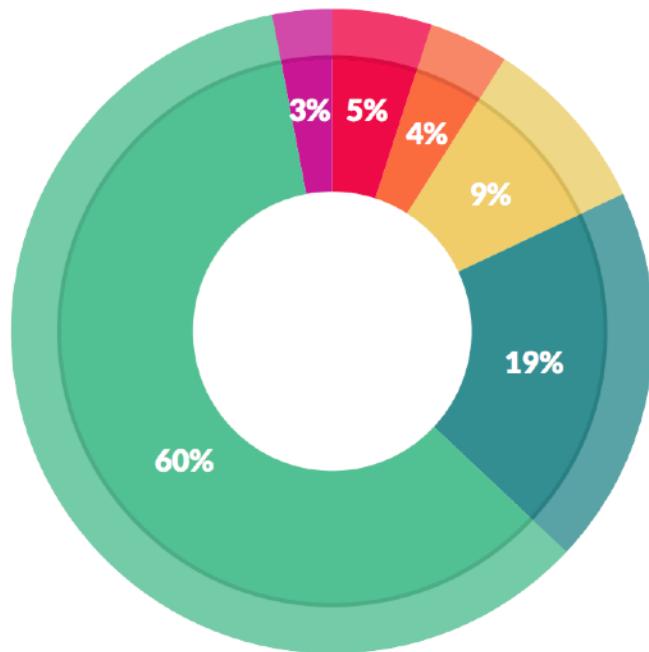


What data scientists do. We now know how data science works, at least in the tech industry. First, data scientists lay a solid data foundation in order to perform robust analytics. Then they use online experiments, among other methods, to achieve sustainable growth. Finally, they build machine learning pipelines and personalized data products to better understand their business and customers and to make better decisions. In other words, in tech, data science is about infrastructure, testing, machine learning for decision making, and data products.

Source: By Hugo Bowen-Anderson
August 15, 2018
Harvard Business Review

How a Data Scientist Spends Their Day

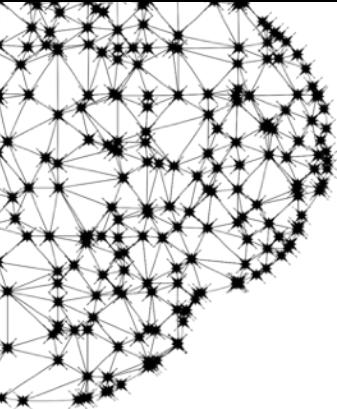
Here's where the popular view of data scientists diverges pretty significantly from reality. Generally, we think of data scientists building algorithms, exploring data, and doing predictive analysis. That's actually not what they spend most of their time doing, however.



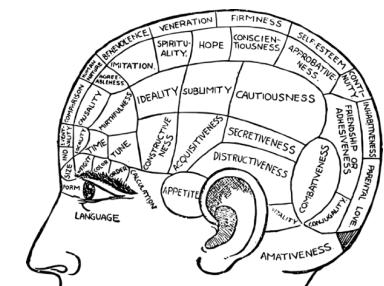
What data scientists spend the most time doing

- *Building training sets:* 3%
- *Cleaning and organizing data:* 60%
- *Collecting data sets:* 19%
- *Mining data for patterns:* 9%
- *Refining algorithms:* 4%
- *Other:* 5%

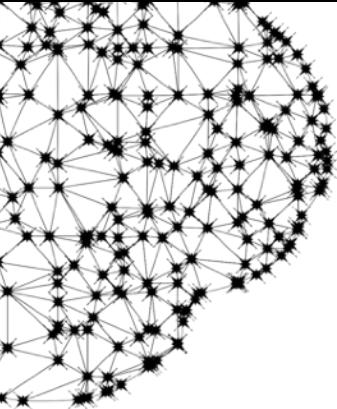
Source: Data Science 2016 Report by CrowdFlower



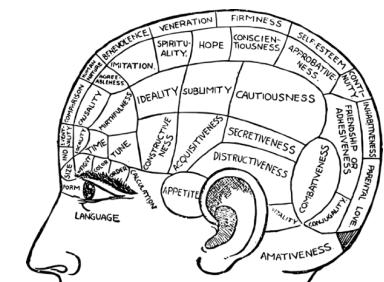
Yes, data is important. But **what kind of data?**

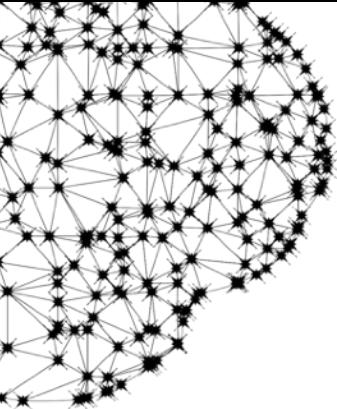




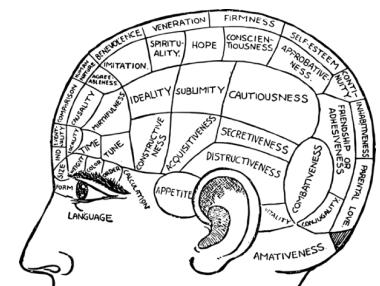


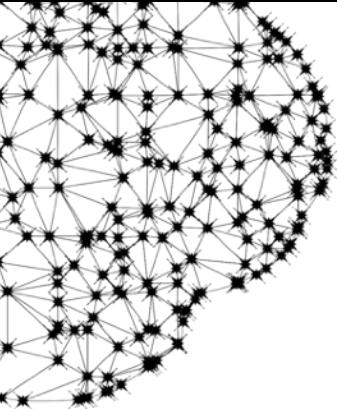
How to avoid bias? How should the data be collected?



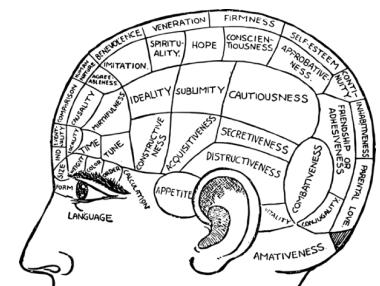


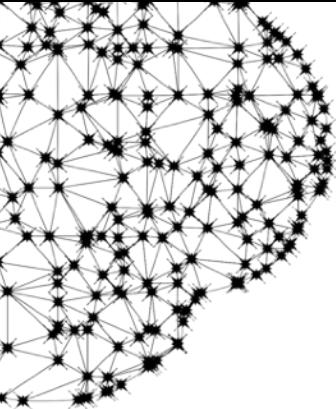
The rise of the new **monopoly**. The platform.



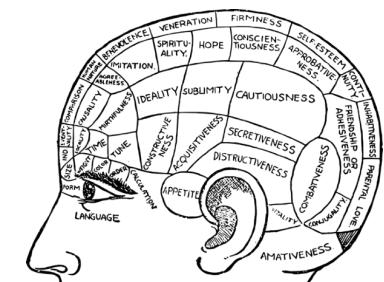


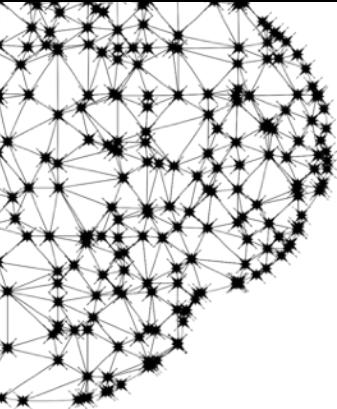
Key **questions** to consider when applying AI.





Questions: Can AI be used? Can it do good? What are the pre-conditions for it to do good without becoming a threat to us?

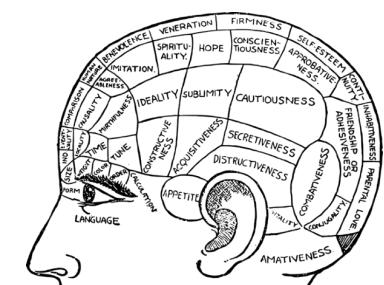


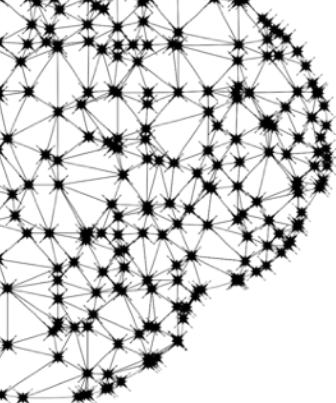


Artificial Intelligence

Threats

Merits





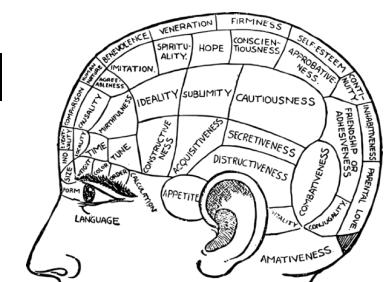
Artificial Intelligence

Merits

1. Applications across industries
2. Overcome shortage of Experts
3. Augment human decisions
4. Detect complex patterns and achieve breakthroughs
5. Creation of new jobs
6. Reduce costs in long-term

Threats

1. Emergence of new monopolies
2. Algorithmic bias
3. Enlarge digital divide
4. Replace humans in some jobs
5. Privacy intrusion
6. Social control



Having fun with machine learning.

Machine Learning **in TeachableMachine**

[About](#) [FAQ](#) [Get Started](#)

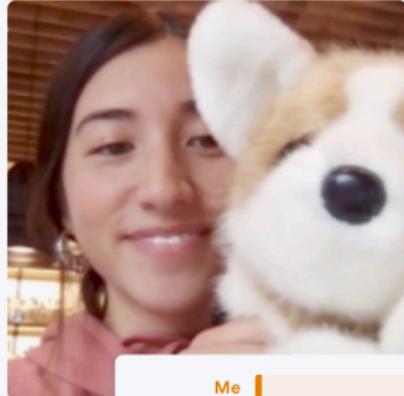
Teachable Machine

Train a computer to recognize your own images, sounds, & poses.

A fast, easy way to create machine learning models for your sites, apps, and more – no expertise or coding required.

[Get Started](#)

TensorFlow.js p5.js Coral Node.js GPU



Me

Me + Dog <3

98%

<https://teachablemachine.withgoogle.com/>

Detect Covid-19 using X-Ray dataset with Machine Learning+ Google Teachable Machine

teachablemachine.withgoogle.com/brain/image

≡ Teachable Machine

Class 1

Add Image Samples:

Webcam Upload

Class 2

Add Image Samples:

Webcam Upload

Training

Train Model

Advanced

Preview

Export Model

You must train a model on the left before you can preview it here.

Add a class

HackSpaceMagaz...pdf v2.sb3 Covid19_Sort_Test...sb3

Artificial Intelligence lessons for Kids

≡ Teachable Machine

Mask

Add Image Samples:



No-Mask

Add Image Samples:



⋮

⋮

Training

Train Model

Advanced

Preview

 Export Model

You must train a model on the left before you can preview it here.

 Add a class

 English (U.S.) 

release-2-2-2 - 2.2.2#062770 - 83

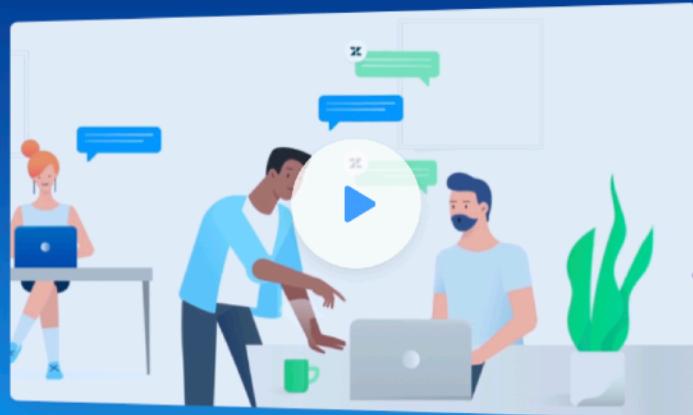
Natural Language Processing (NLP) in **MonkeyLearn**

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Create new value from your data

Train custom machine learning models to get topic,
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Demo

Batch

API

Integrate

Batch Processing



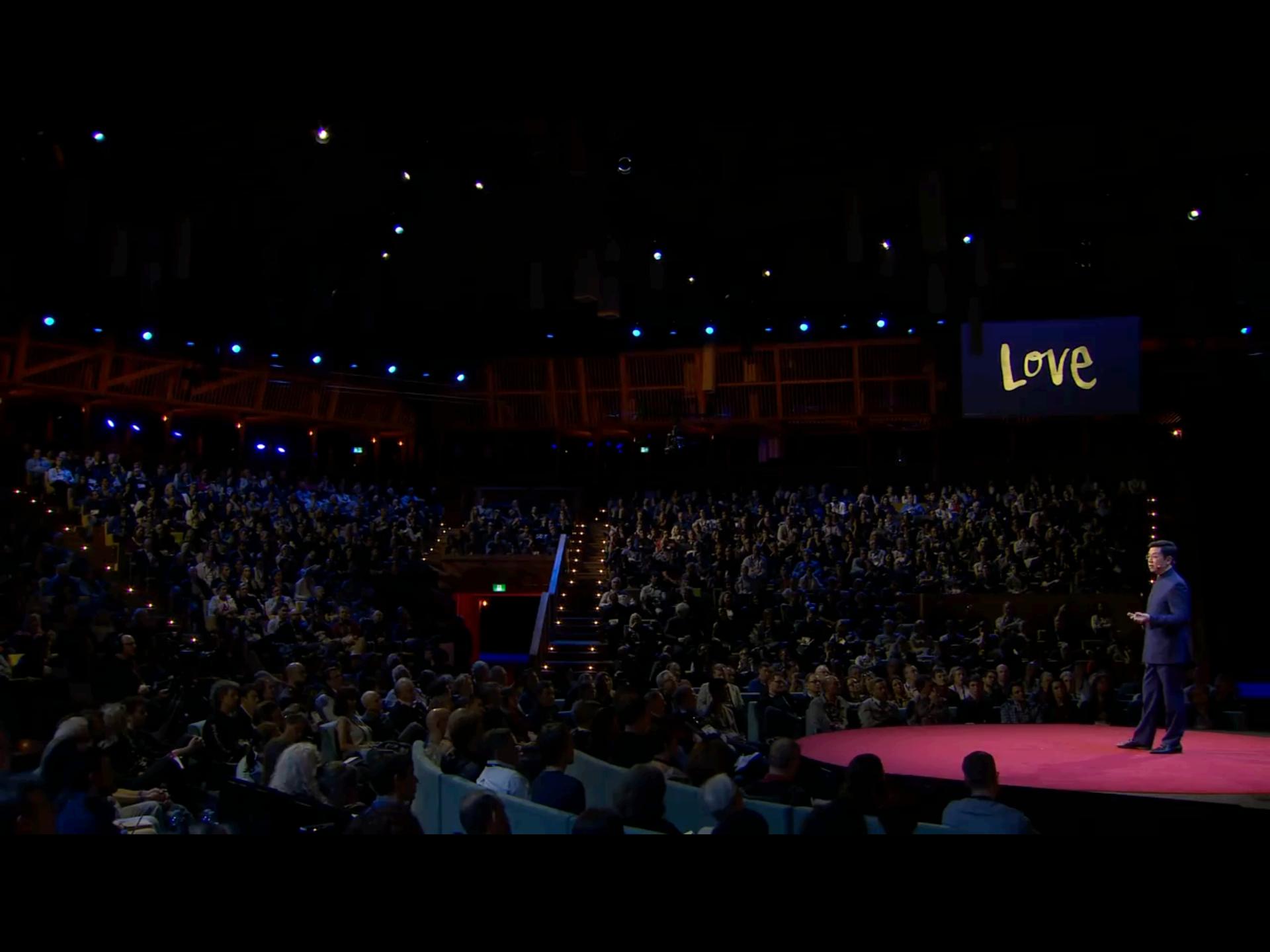
Process your file using Sentiment
Analysis

+ New batch

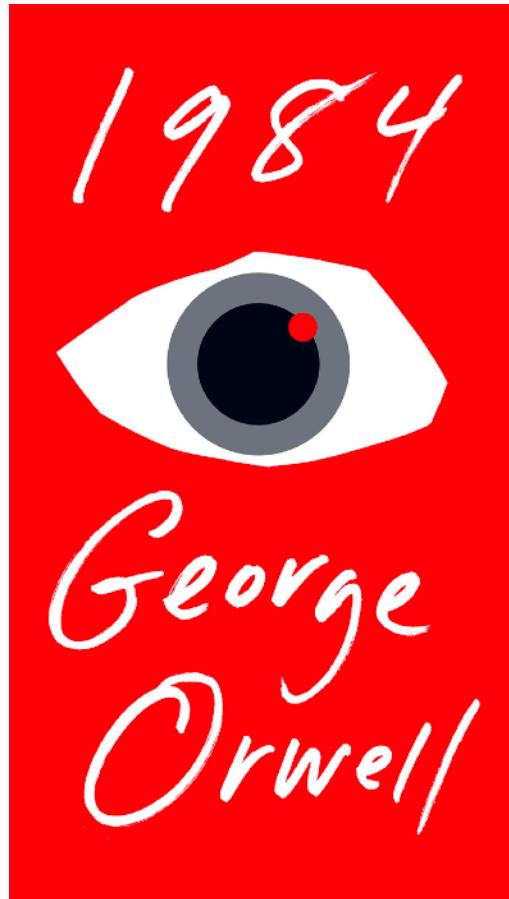


Artificial Intelligence will become easier to use and be integrated into all kinds of products and services.

**The future of learning, play, works, friendship,
community, life, identity and love.**



Love



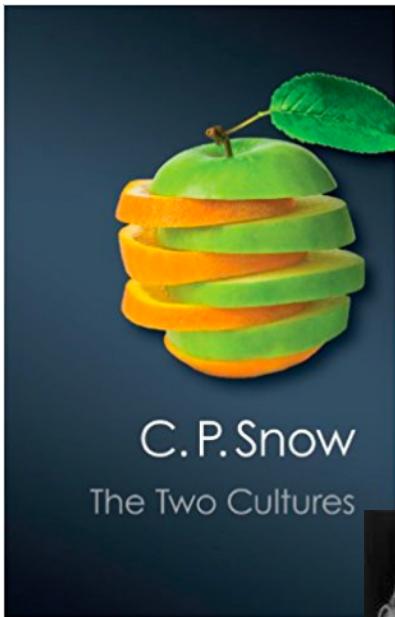
Welcome to the brave new world!

BTCUSD Crypto Chart



Source: Investopedia

From ABC to ABCD (AI, Blockchain, Cloud Computing, and Big Data)



"The Two Cultures is the first part of an influential 1959 Rede Lecture by British scientist and novelist C. P. Snow. Its thesis was that "the intellectual life of the whole of western society" was split into the titular two cultures – namely the sciences and the humanities – and that this was a major hindrance to solving the world's problems."

[Wikipedia](#)

Thank you for your time!