

Siam Innovation District
DESIGN THINKING
FOR BUSINESS INNOVATION

IDEATE
 EMPATHIZE
 DEFINE
 PROTOTYPE

Kaweeuwut Temphuwapat
 Team Lead, Innovation Lab and CVC,
 PTT Group Design Leader,
 MBA, Stanford University d.leader, Stanford d.school

Apply Now – Aug 31, 2017 : Open for Public

Start Course : SEP 9 – OCT 7, Every Saturday, 09.00 - 12.00
 Chaloem Rajakumari 60 Building (Chamchuri 10 Bldg), Fl 4
 Limited Seats! Selected candidates will be fully-funded towards the course fee, worth 35,000 baht

CONTACT US
 093-725-0808
 02-218-3106-7
[@cuinnovationhub](https://www.facebook.com/cuihub)

CU INNOVATION HUB

MACHINE LEARNING
Siam Innovation District Tech Talent

Machine Learning

- Essential tools and libraries: Python, Jupyter Notebook, NumPy, Pandas, SciPy, Scikit-Learn, Matplotlib, and Seaborn
- Data collection through API and web scraping
- Machine Learning Algorithms reviews
- A tour of interesting applications of machine learning and AI
- Hands-on project - create your own full-stack application with Machine Learning/AI backend

Warodom Khamphanchai, Ph.D.
 Bangkok AI Ambassador,
 Ex-Software Developer at Samsung SmartThings in Palo Alto, CA. Ex-Full Stack Developer at BEMOSS.org

Sorawit Saengkyongam
 Data Scientist at Agoda,
 Google Developer Expert in Machine Learning.

Apply Now – Sep 8, 2017 : Open for Public

Start Course : SEP 17 – OCT 29, Every Sunday, 09.00 - 17.00
 Chaloem Rajakumari 60 Building (Chamchuri 10 Bldg), Fl 4
 Limited Seats! Selected candidates will be fully-funded towards the course fee, worth 35,000 baht

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24 Steps to Successful Startup Course

STAR TUP

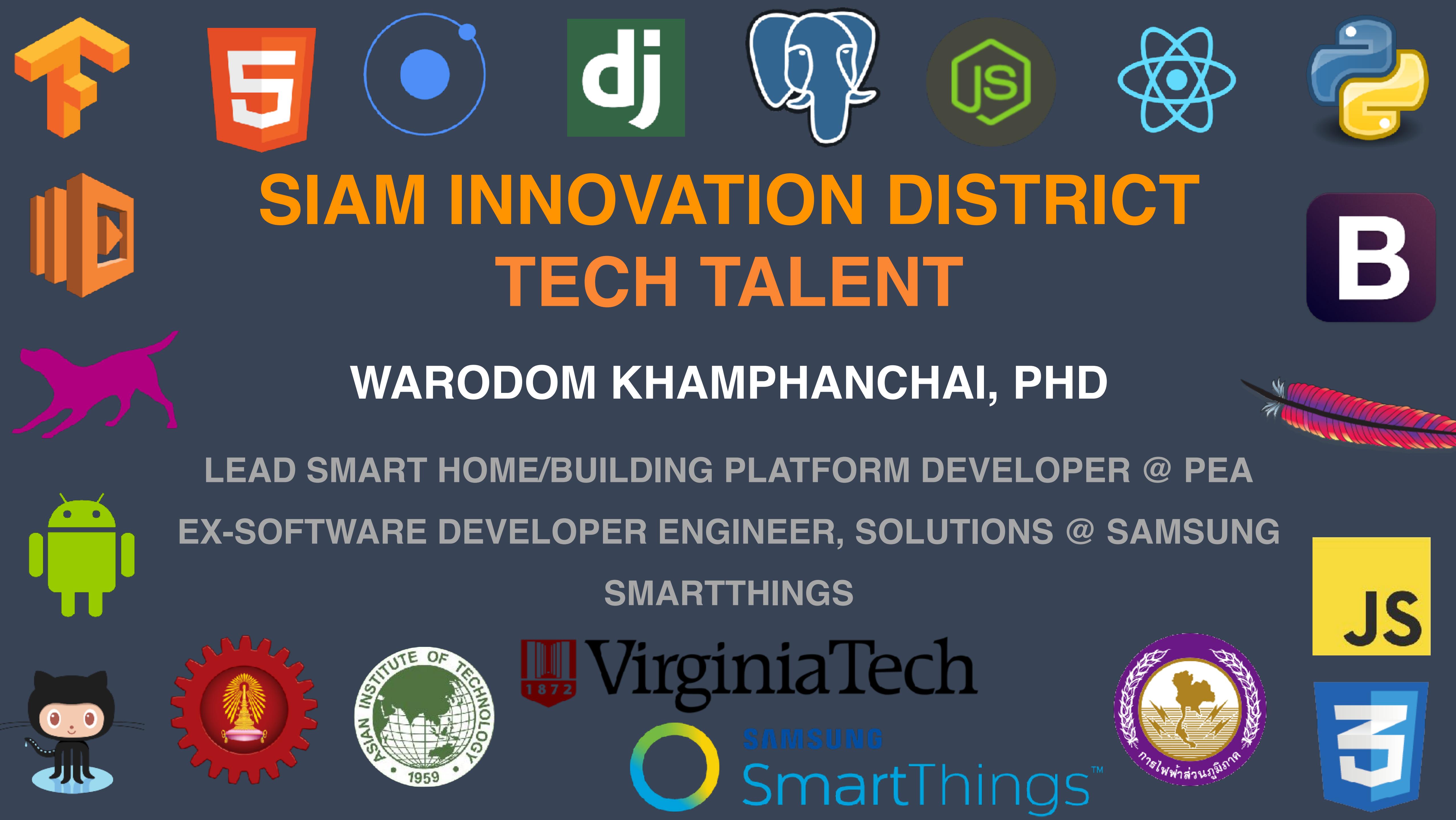
I want to make happen? Join this comprehensive startup course to take your startup idea Research through to Building your startup pitch deck and get ready for startup building course from the MIT

Tareef Jaffer
 Ex-teaching staff at MIT, Ex-Goolger, Serial Entrepreneur

ug 31, 2017 : Open for Public

14, Every Saturday, 9.00 - 13.00
 ding (Chamchuri 10 Bldg), Fl 4
 idates will be fully-funded towards the course fee, worth 35,000 baht

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LEAD SMART HOME/BUILDING PLATFORM DEVELOPER @ PEA

EX-SOFTWARE DEVELOPER ENGINEER, SOLUTIONS @ SAMSUNG

SMARTTHINGS

VirginiaTech

SAMSUNG
SmartThings™



JS

ES



Warodom Khamphanchai, PhD

- LEAD SMART HOME/BUILDING PLATFORM DEVELOPER @ PEA
- EX-SOFTWARE DEVELOPMENT ENGINEER @ SAMSUNG SMARTTHINGS

Interests: Home/Building Automation, Internet of Things, Smart Grid, Multi-Agent systems, Data Analytics, Machine Learning, Deep Learning, AI, Energy Audit, and Technology Entrepreneurship.

Education:

- [2011-2016] Ph.D. in Electrical and Computer Engineering,
Virginia Tech

Dissertation: An Agent-based Platform for Demand Response Implementation in Smart Buildings

- [2009-2011] M.E. in Energy (Area of Specialization: Electric Power System Management), Asian Institute of Technology
Thesis: A Multi-Agent Based Power System Restoration

Approach in Distributed Smart Grid

- [2005-2009] B.E. in Electrical Engineering, Chulalongkorn University



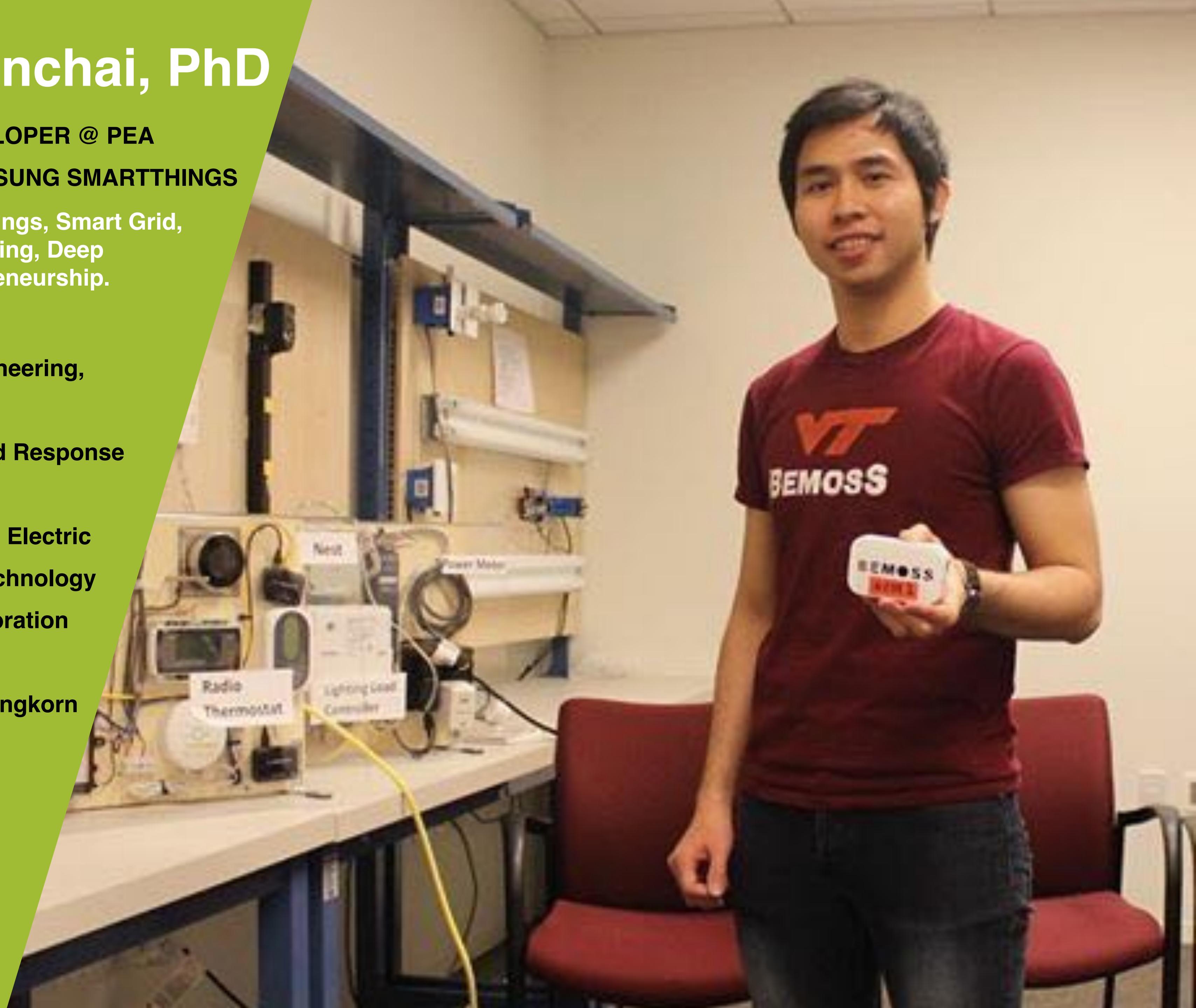
Line: kwarodom

LinkedIn: www.linkedin.com/in/kwarodom

Web: kwarodom.wordpress.com

Email: kwardom@vt.edu

Tel: +6695-161-5011 Github: kwarodom

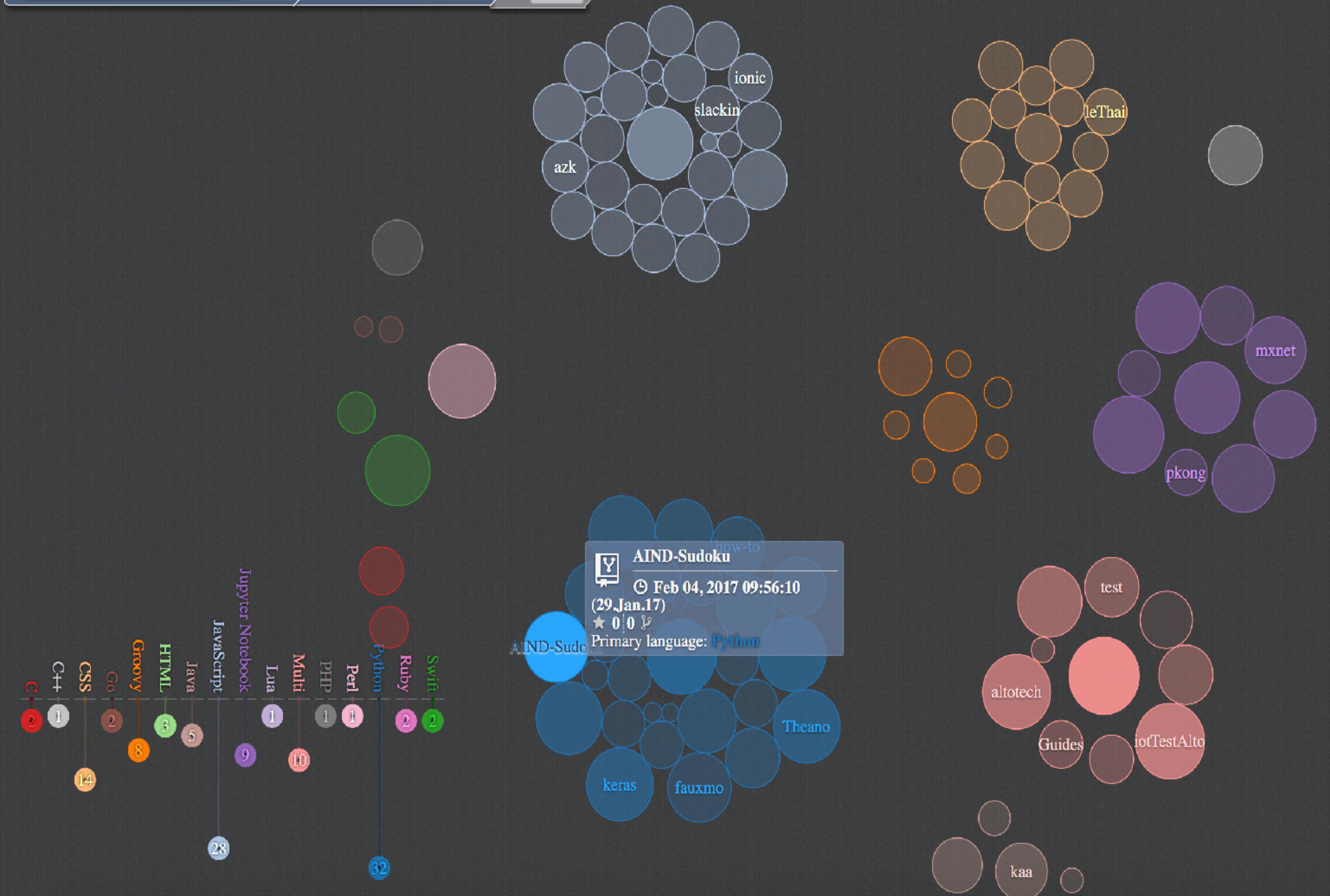
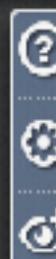




Profile

Sorawit Saengkyongam (James)

- Data Scientist at Agoda where he works on research and development of personalization algorithms and recommendation systems
- Google Developer Expert in Machine Learning.
- Organize Bangkok Machine Learning Meetup
- Graduated with a major in Mathematical Statistics from Chulalongkorn University (with first class honours)



Your Artificial Intelligence Community

We are a community of 20+ cities that share discoveries in applied AI and connect you to international peers. For that purpose we organize quarterly get togethers that help you to connect to your local artificial intelligence community

[FIND YOUR CITY](#)[BECOME AMBASSADOR](#)[FOLLOW AI NEWS](#)



OUR MISSION IS

to connect as many AI experts, technologists, business leaders, policy makers and innovators with the rest of non-tech humans affected by AI systems, for the greater good and economic prosperity.

this is what we call AI democracy.

We are a community of 25+ cities that collaborate to leverage the potential of AI⁸

Western Europe

Amsterdam - Berlin - Hamburg - London - Madrid - Paris - Rome - Valencia - Valletta

Central Europe

Bucharest - Budapest - Cluj - Krakow - Sofia - Tallinn - Tirana - Vienna

Nordics

Copenhagen - Helsinki - Malmo - Stockholm

North America

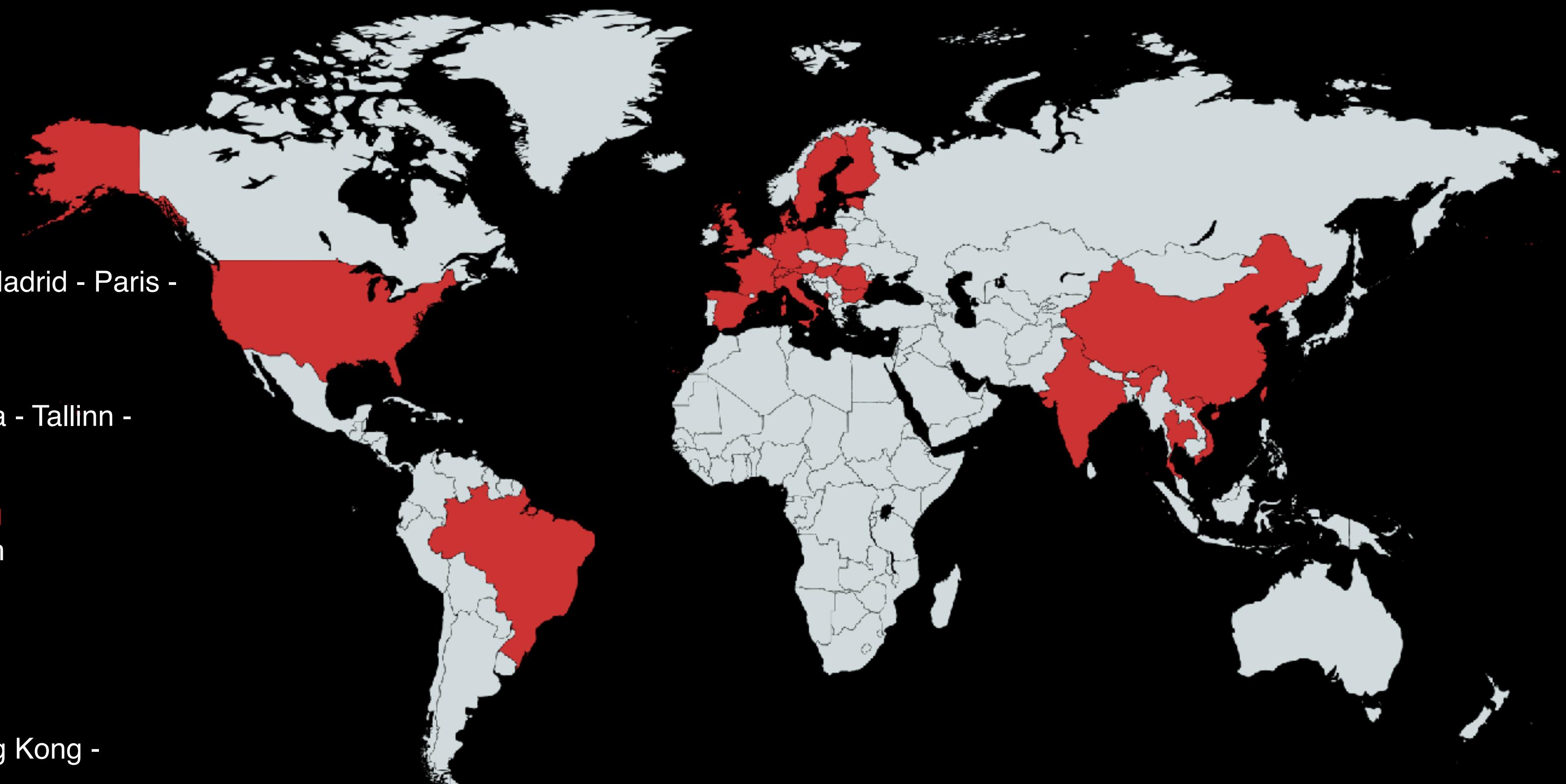
New York - San Francisco

South-East Asia

Bangalore - **Bangkok** - Delhi - Hanoi - Hong Kong - Singapore

South America

Sao Paulo



JOIN BANGKOK AI



Bangkok.City.Ai

Edit Tiles

03/31/2016 11:14 PM

: 04:43:08 A

Apr 03

Apr 10

Apr 17

Apr 24

May

May 08

May 15

May 22

May 29

Jun 05

Jun 12

Jun 19

Jun 26

Jul 03

Jul 10

Jul 17

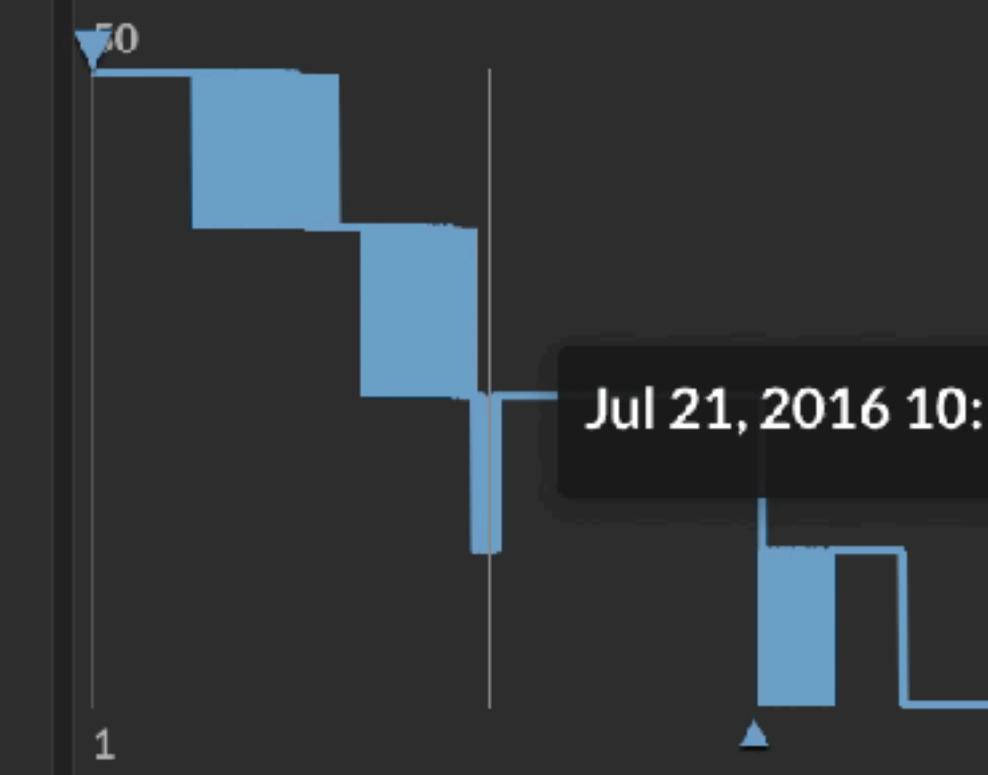
Front Door Multi(contact)

open

Since Aug 3, 2016 4:21:25 AM

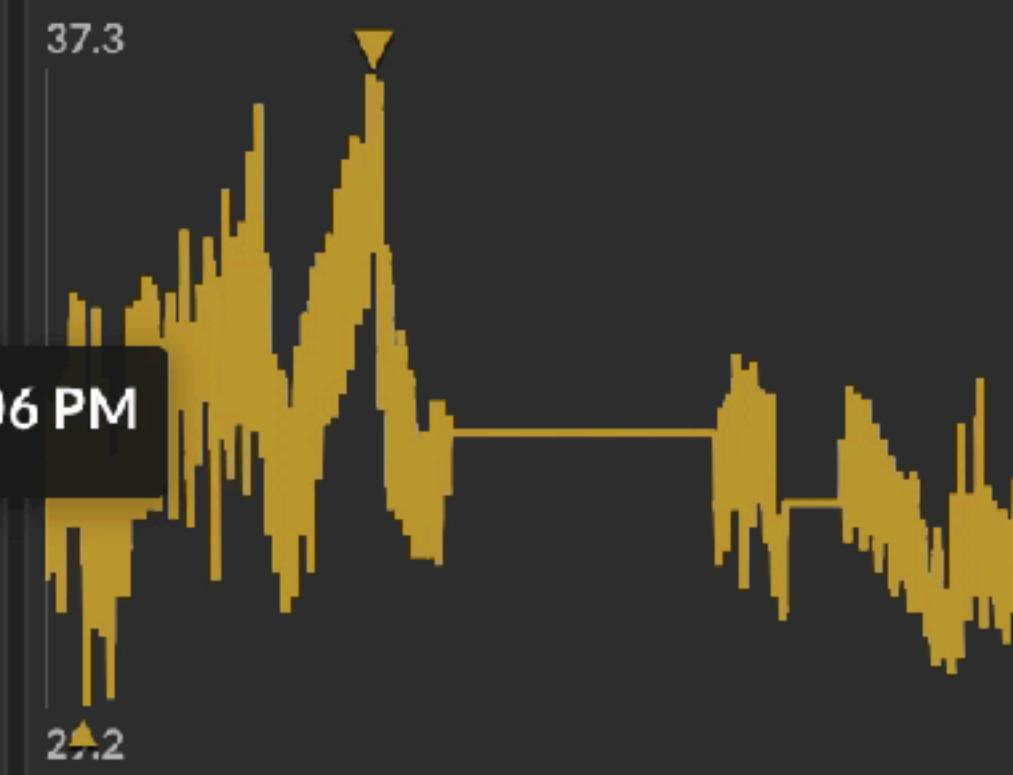
Motion 2nd Floor(battery %)

●1



Motion (temperature_C)

●32.8



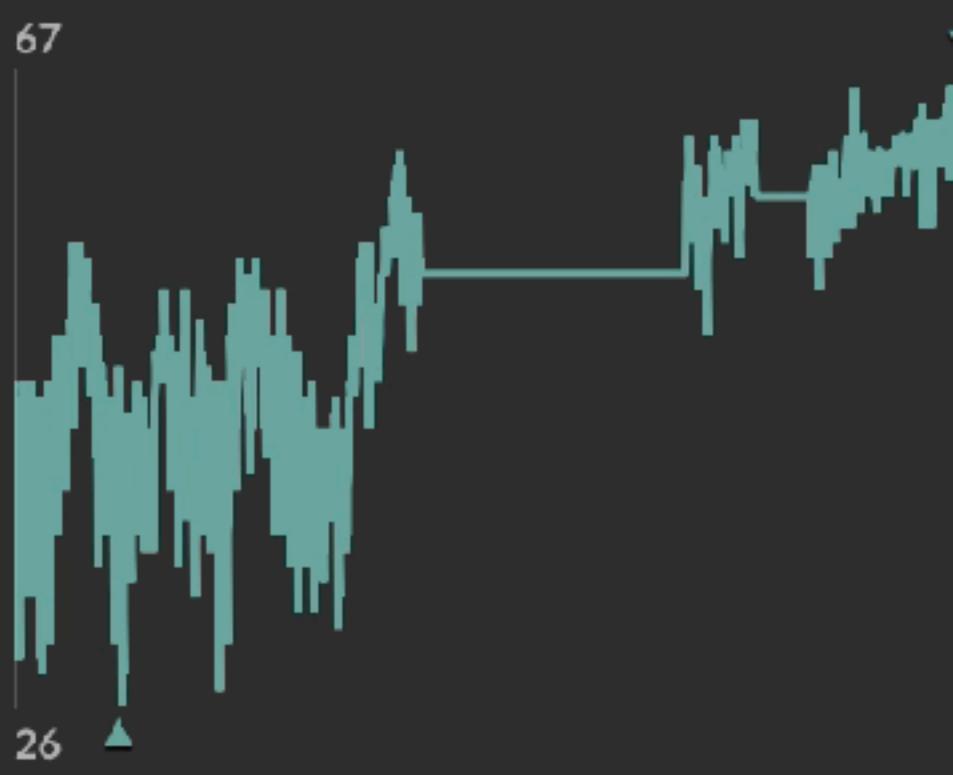
Motion (motion)

inactive

Since Aug 3, 2016 3:48:55 AM

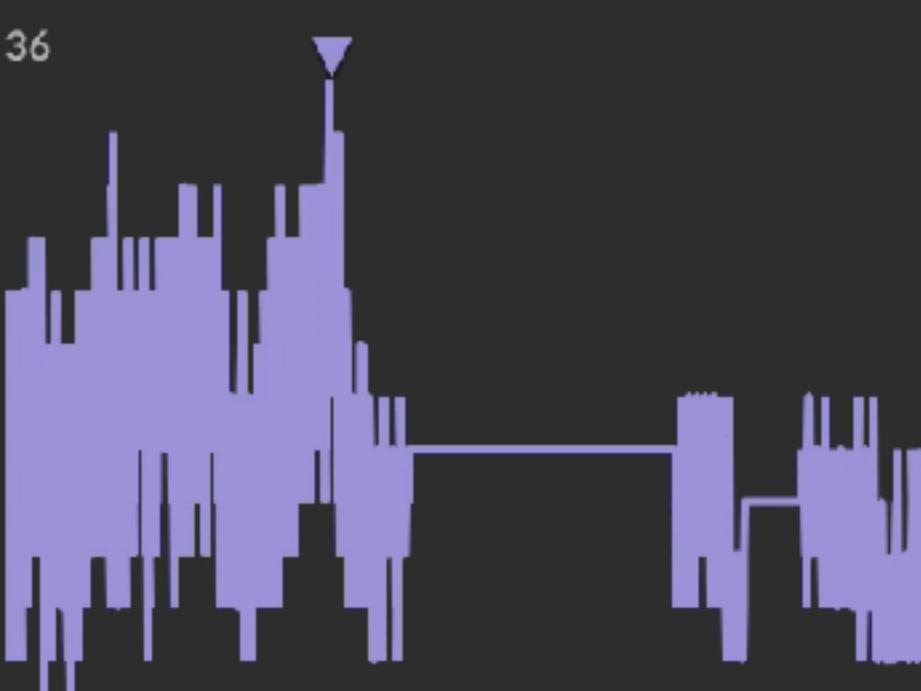
Motion (humidity %)

●57



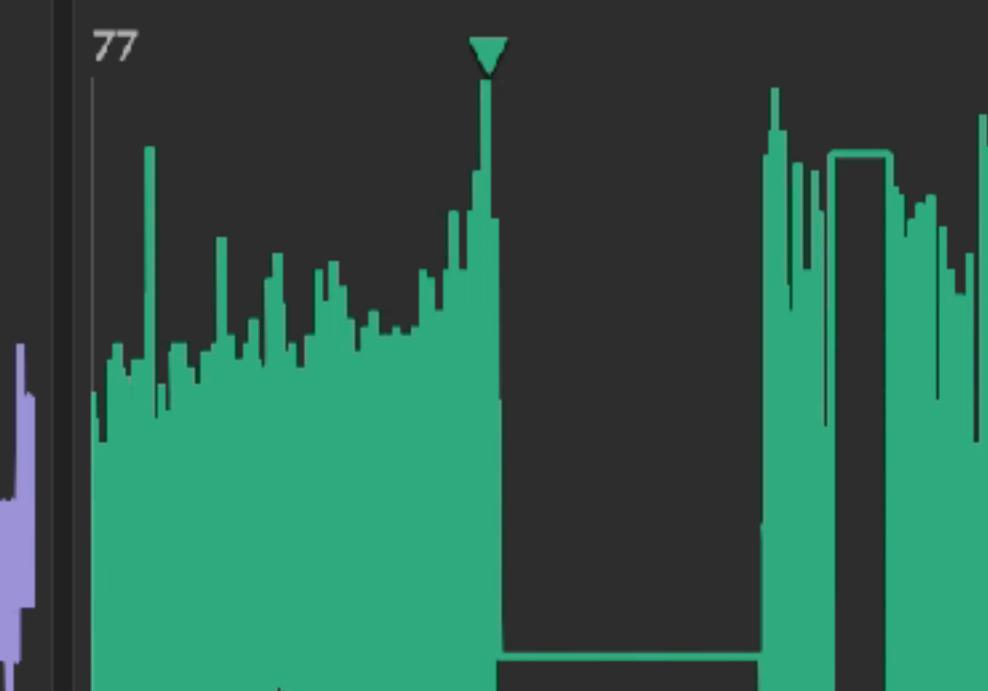
Front Door Multi(temperature)

●29



Motion (illuminance_lux)

●0



Motion 2nd Floor(motion)

(switch)



Good Morning(switch)

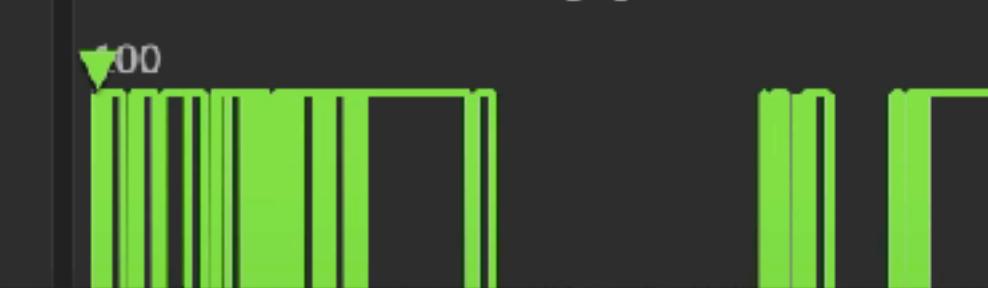
on

Since Jun 27, 2016 4:15:31 PM

Hue(switch)

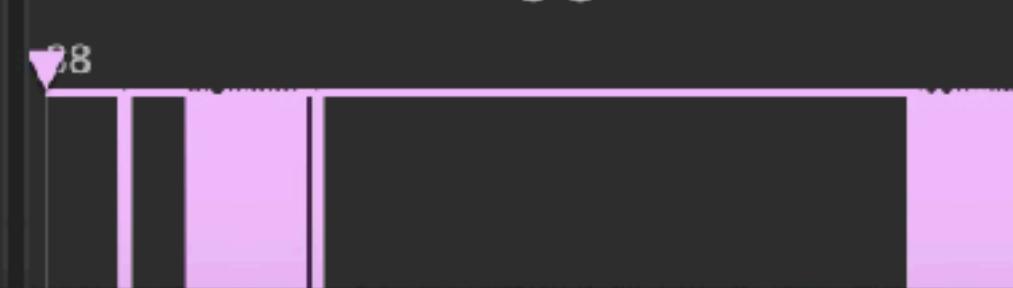
Hue(level)

●99



Arrival (battery %)

●88



Good Night(switch)

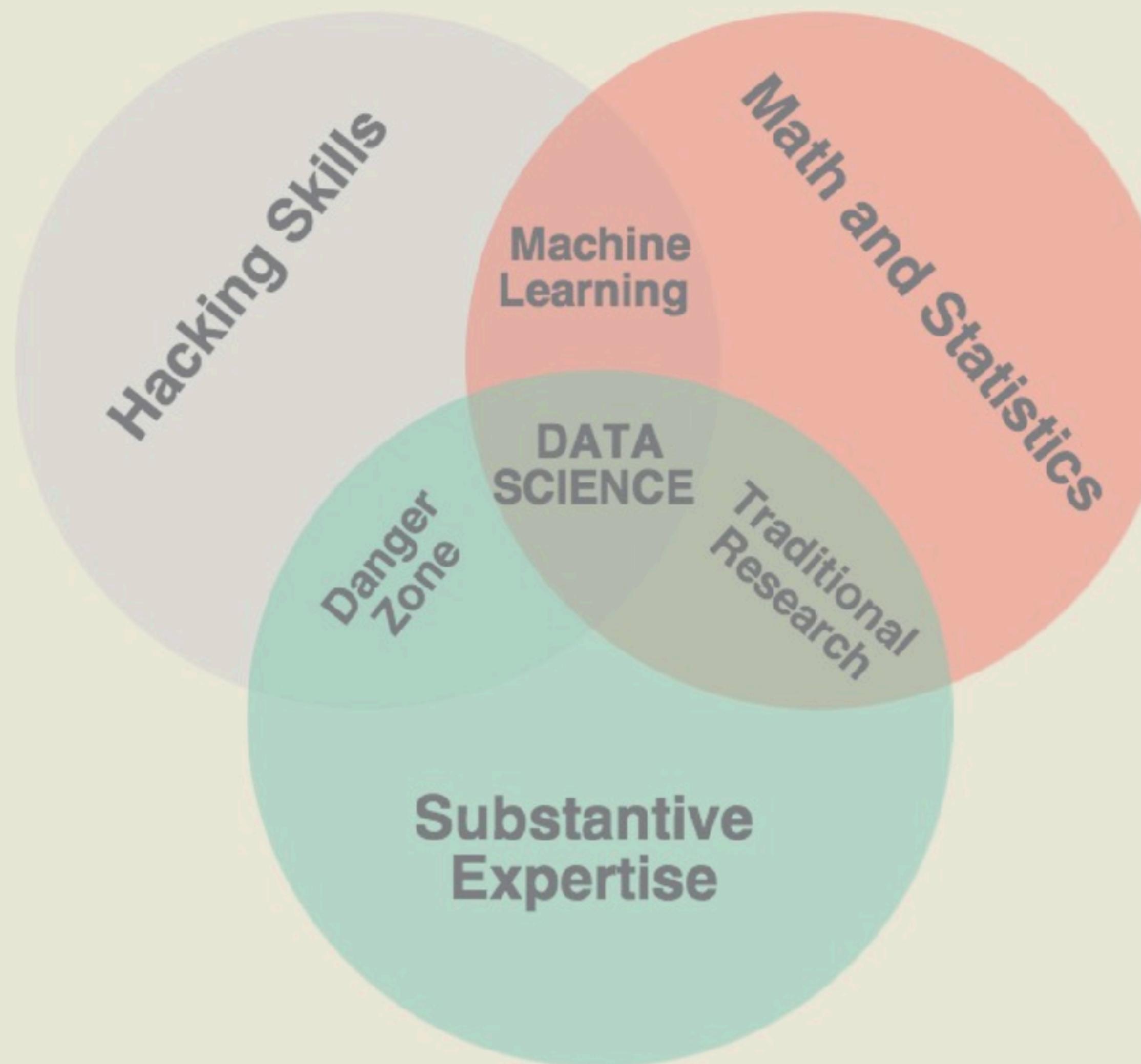


Siren 1st Floor(alarm)

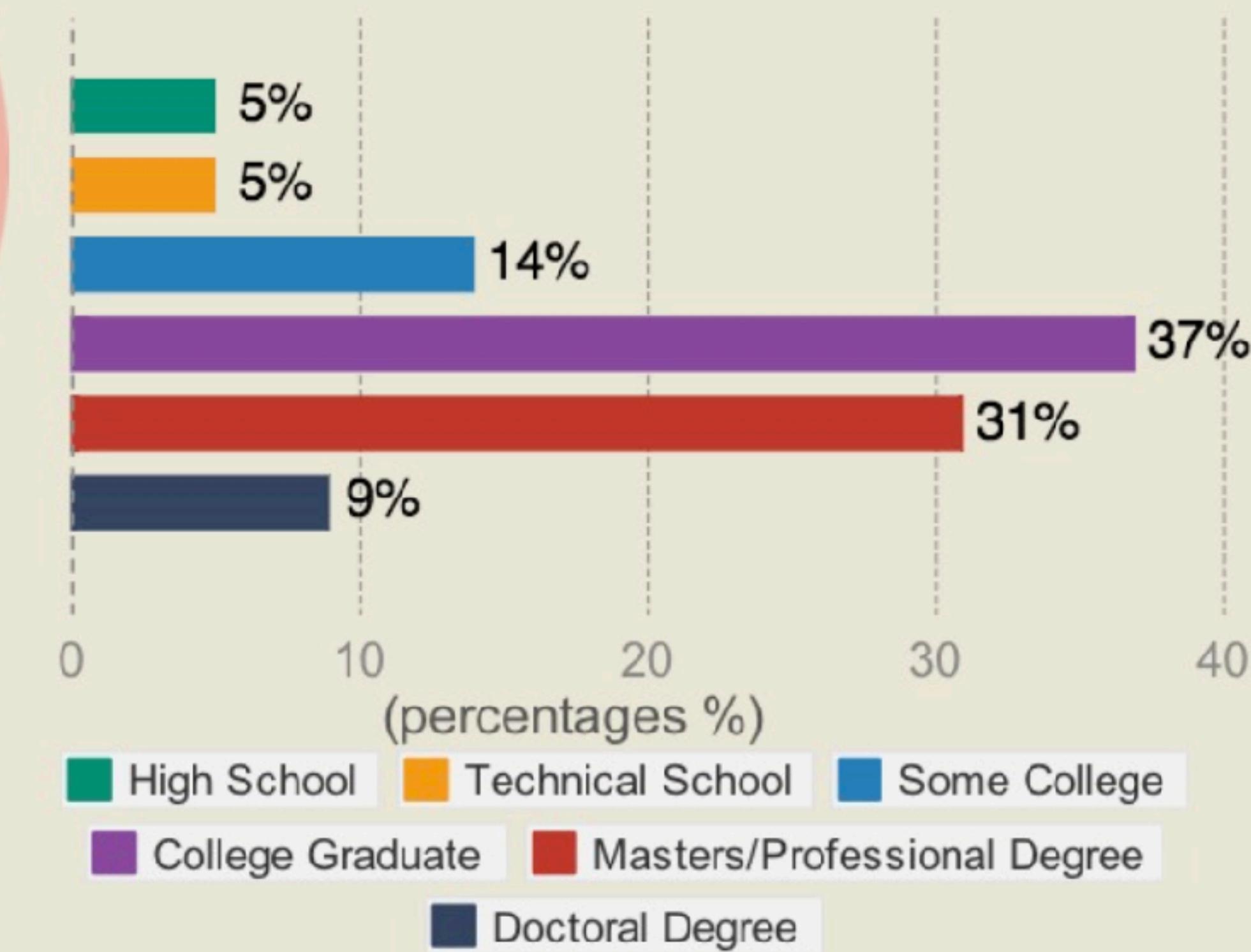
off

Since Jun 27, 2016 4:15:31 PM

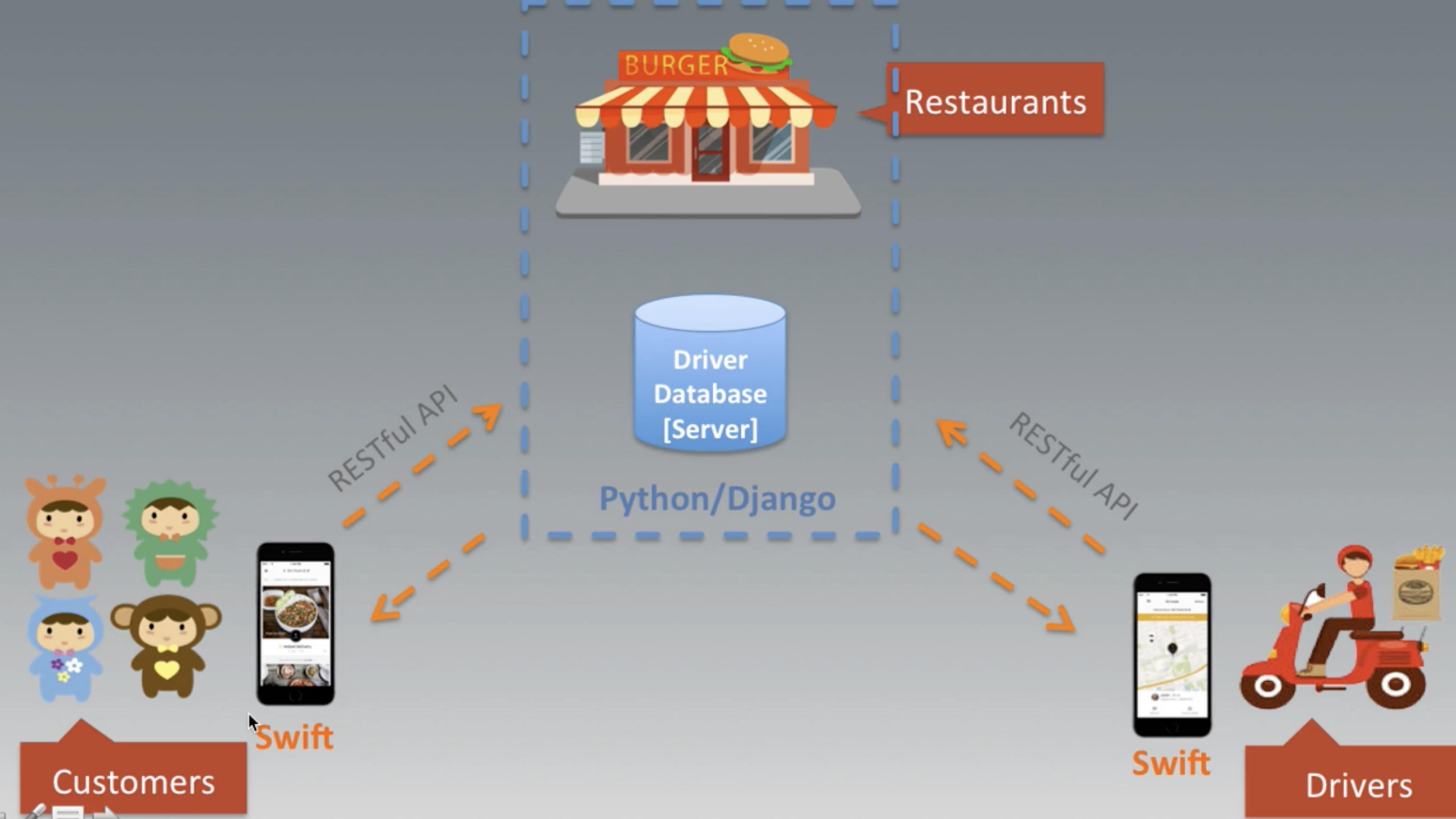
What's a data scientist?



Typical Background



A data scientist is someone who is better at statistics than any software engineer and better at software engineering than any statistician.



Disruptive companies
differentiated by
**INTELLIGENT
APPLICATIONS**
using

Machine Learning

 **glassdoor**[™]
Human
Resources

 **eHarmony**[®]
Dating

 **UBER**
Taxis

 **RelateIQ**
CRM

 **fitbit**
Wearables

 **amazon**[®]
Retail

 **NETFLIX**
Movie
Distribution

 **Google**
PageRank
Search

 **livingsocial**
Coupons

 **LinkedIn**
Networking

 **Obama'08**
Campaigning

 **Zillow**[®]
Real Estate

 **Avvo**
Legal
Advice



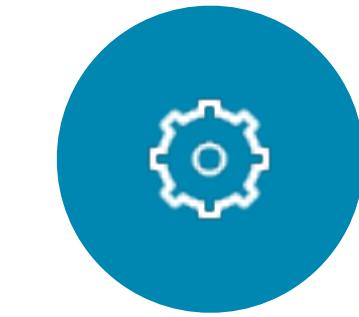
OUTLINE



MACHINE LEARNING PRACTITIONER



ACADEMIC ML



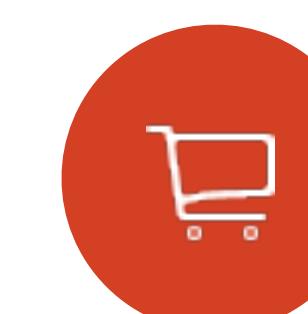
MACHINE LEARNING TOOLS



EXAMPLE OF ML APPLICATIONS



CLOUD-BASED ML



**LEARN TO BUILD WEB-BASED
RECOMMENDER SYSTEM**



OPEN-SOURCE ML



**MACHINE LEARNING
RESOURCES**



BEFORE WE GET STARTED

U UDACITY

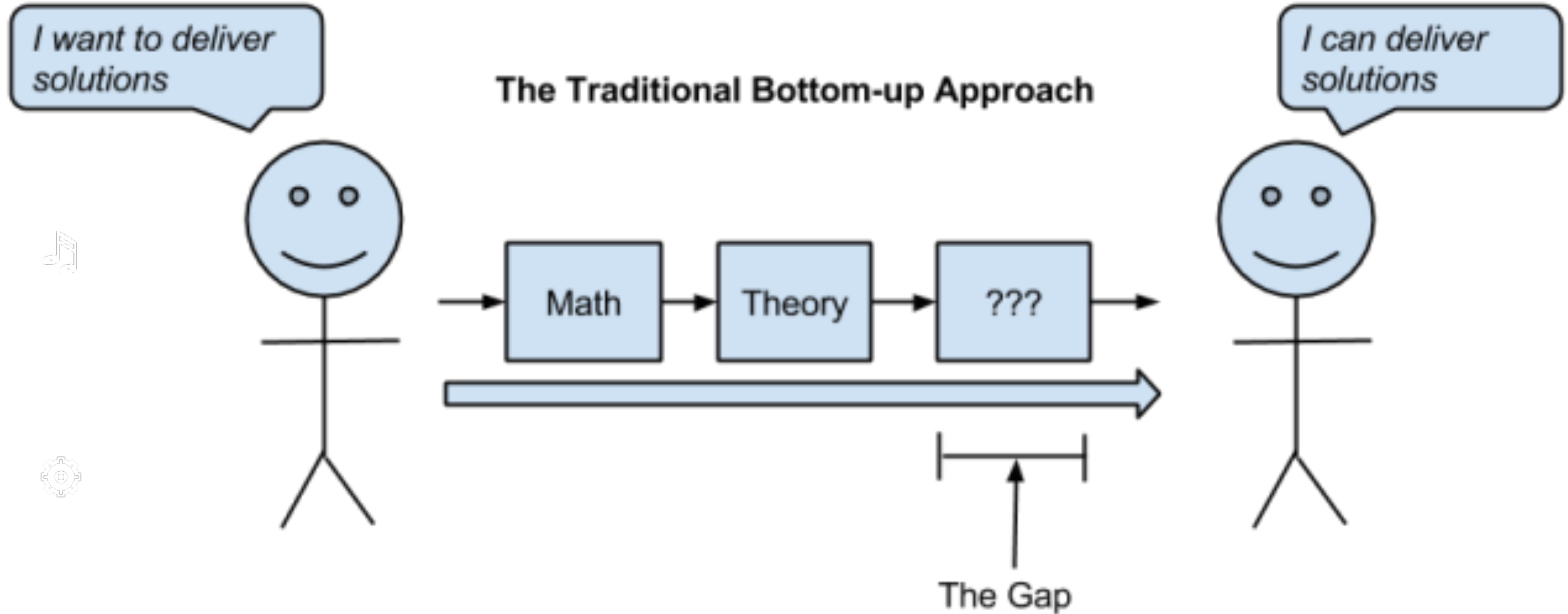


Ultimate Skills Checklist for Your First Data Analyst Job





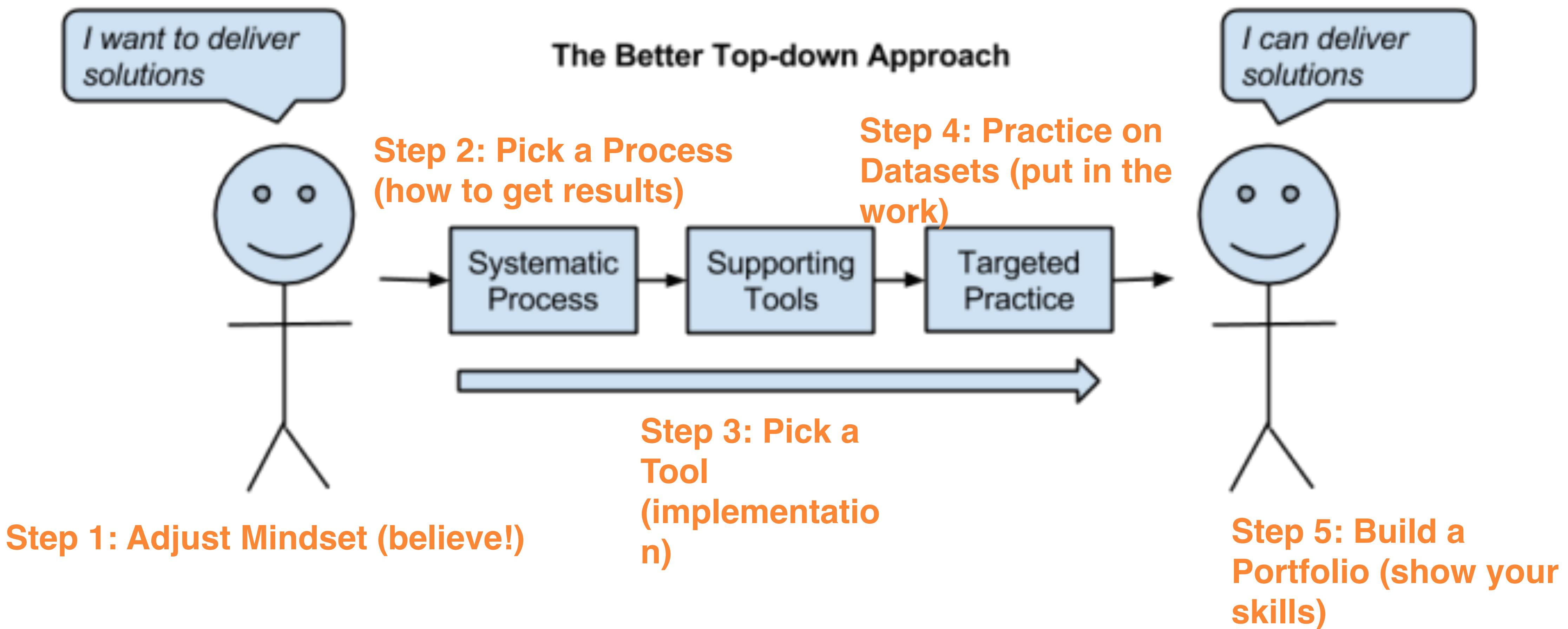
MACHINE LEARNING PRACTITIONER



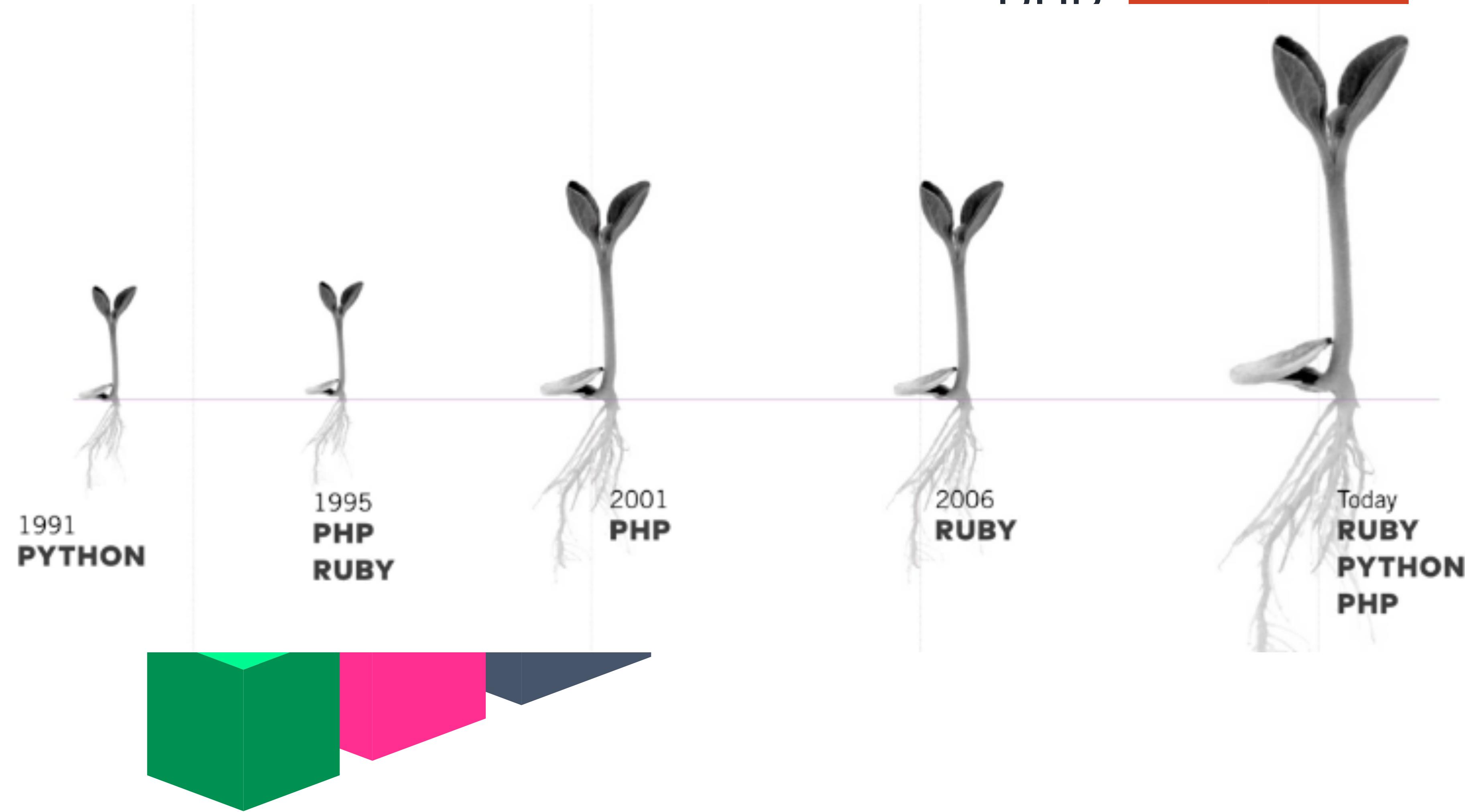


MACHINE LEARNING PRACTITIONER

5-Steps To Get Started and Get Good at Machine Learning



7 LANGUAGES THAT MAKE YOUR DREAMS COME TRUE



WHAT DEV STACK BEING USED BY TOP TECH FIRM

The screenshot displays a grid of technology logos and names, categorized into several groups:

- Application and Data:** PHP, React [2], Memcached [4], Cassandra [8], Languages, Javascript UI Libraries.
- Utilities:** Framer [14], Testdroid [17], Origami [22], Stetho [26], Mobile Prototyping & I..., Mobile Test Automation, Mobile Prototyping & I..., Mobile Runtime Inspec..
- Frameworks (Full Stack):** Flux, Tornado, HHVM (HipHop Virtual Machine), GraphQL [16], Query Languages, Virtual Machine.
- Big Data Tools:** Presto [18], Relay [20], Javascript UI Libraries, Languages, Databases.
- Memcached Tools:** McRouter [24], Buck [27], Java Build Tools.
- Business Tools:** Confluence [5], Project Management, Campaign Monitor, Email Marketing.
- DevOps:** Jenkins, Chef, Datadog [7], Phabricator [11], Continuous Integration, Server Configuration a..., Performance Monitor..., Code Review.
- Testing and Development:** Jest [15], Javascript Testing Fram..., Nuclide [19], Integrated Developme..., Infer [25], Code Review.

Each technology entry includes a small icon and a count in brackets indicating its popularity or usage.

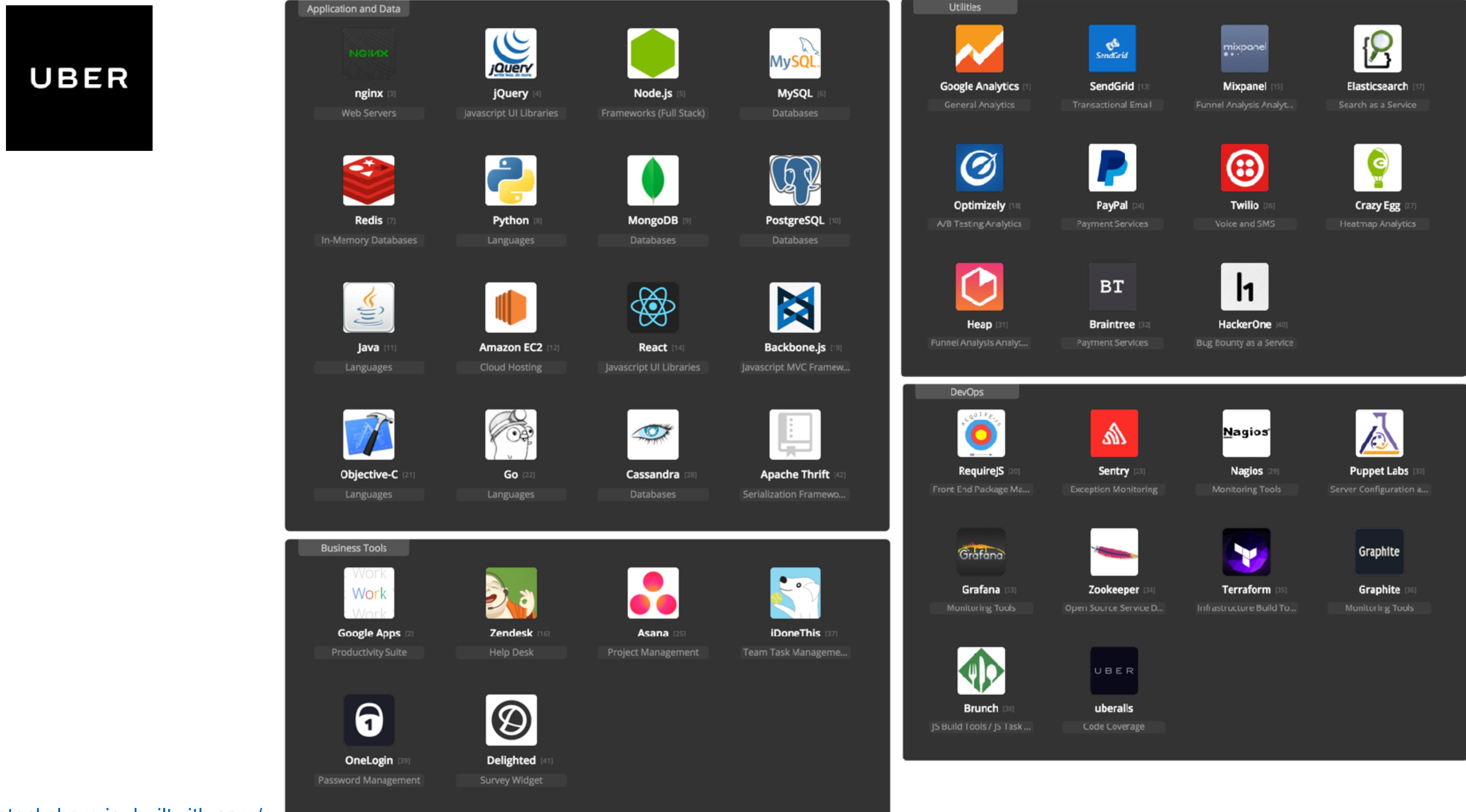
WHAT DEV STACK BEING USED BY TOP TECH FIRM



The image displays four screenshots from the website stackshare.io, illustrating the diverse range of technology stacks used by leading tech companies. The stacks are categorized as follows:

- Application and Data:** This category includes Web Servers (nginx), Languages (JavaScript, MySQL, Ruby, Redis, Java), Frameworks (Rails), In-Memory Databases (Amazon S3), CSS Pre-processors (Sass), Cloud Hosting (Amazon EC2), Javascript UI Libraries (React), SQL Database as a Service (Amazon RDS), Big Data Tools (Amazon ElastiCache, Amazon EBS, Hadoop, Presto), Managed Mem Cache (Amazon ElastiCache), Cloud Storage (Amazon EBS), Databases (Hadoop), Big Data Tools (Presto), Workflow Manager (Airflow), Database Tools (Airpal), and Big Data Tools (Druid).
- Utilities:** This category includes General Analytics (Google Analytics), Content Delivery Network (Amazon CloudFront), Transactional Email (SendGrid), Funnel Analysis (Mixpanel), DNS Management (Amazon Route 53), Voice and SMS (Twilio, Braintree, Nexmo), Payment Services (Braintree), Voice and SMS (Nexmo), Mobile Push Messaging (Urban Airship), A/B Testing Analytics (Visual Website Optimizer), Machine Learning Tools (Aerosolve), and Deep Linking as a Service (DeepLinkDispatch).
- Business Tools:** This category includes Productivity Suite (Google Apps), Group Chat & Notifications (Slack), Project Management (Asana), Interactive Mockups (InVision), Email Marketing (Campaign Monitor), Business Intelligence (Caravel), Visual Collaboration (Assemblage), Monitoring Tools (Kibana), Log Management (Logstash), Cloud Monitoring (Amazon CloudWatch), Cluster Management (Apache Mesos), Performance Monitoring (Scout), Continuous Integration (Solano CI), Open Source Service Discovery (SmartStack), and JavaScript Testing Framework (Enzyme).
- DevOps:** This category includes Code Collaboration (GitHub), Performance Monitoring (New Relic), Virtual Machine Management (Vagrant), JS Build Tools / JS Task Runner (Webpack), Exception Monitoring (Sentry), Server Configuration Automation (Chef), Javascript Testing Framework (Mocha), Performance Monitoring (Datadog), Monitoring Tools (Kibana), Log Management (Logstash), Cloud Monitoring (Amazon CloudWatch), Cluster Management (Apache Mesos), Performance Monitoring (Scout), Continuous Integration (Solano CI), Open Source Service Discovery (SmartStack), and JavaScript Testing Framework (Enzyme).

WHAT DEV STACK BEING USED BY TOP TECH FIRM



WEB DEVELOPMENT PROCESS



WEB DEVELOPMENT CYCLE



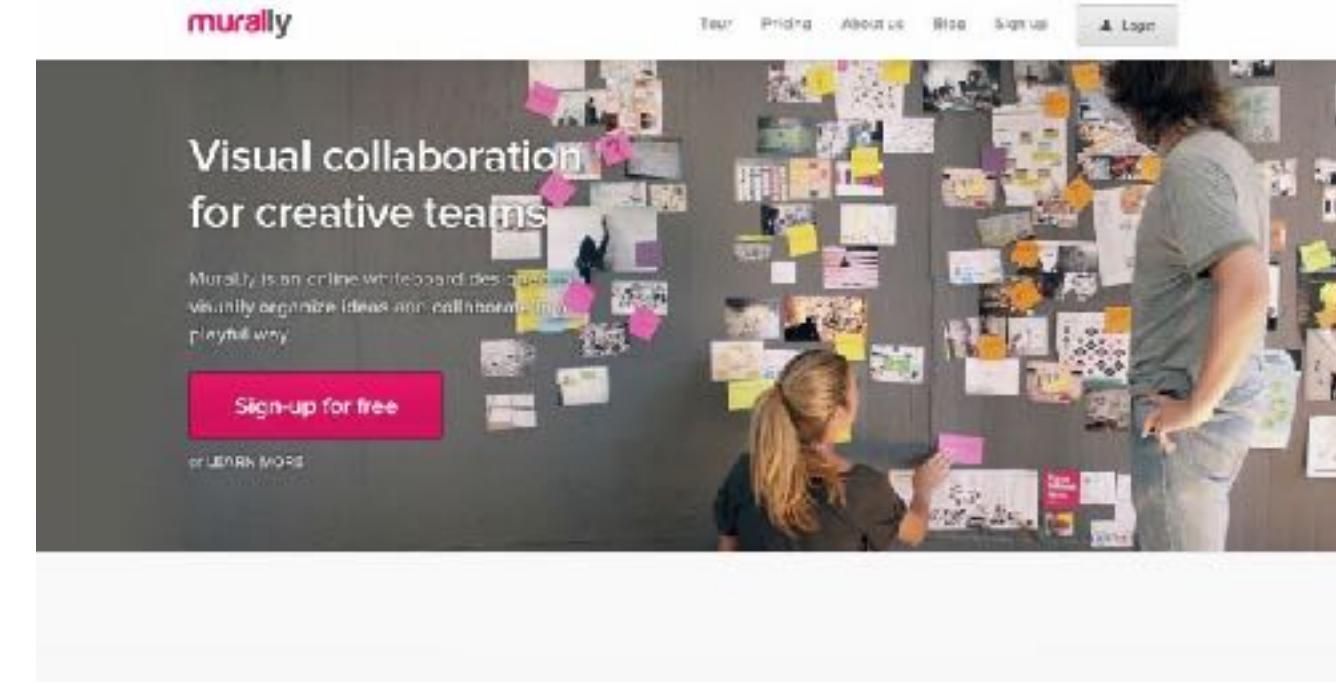
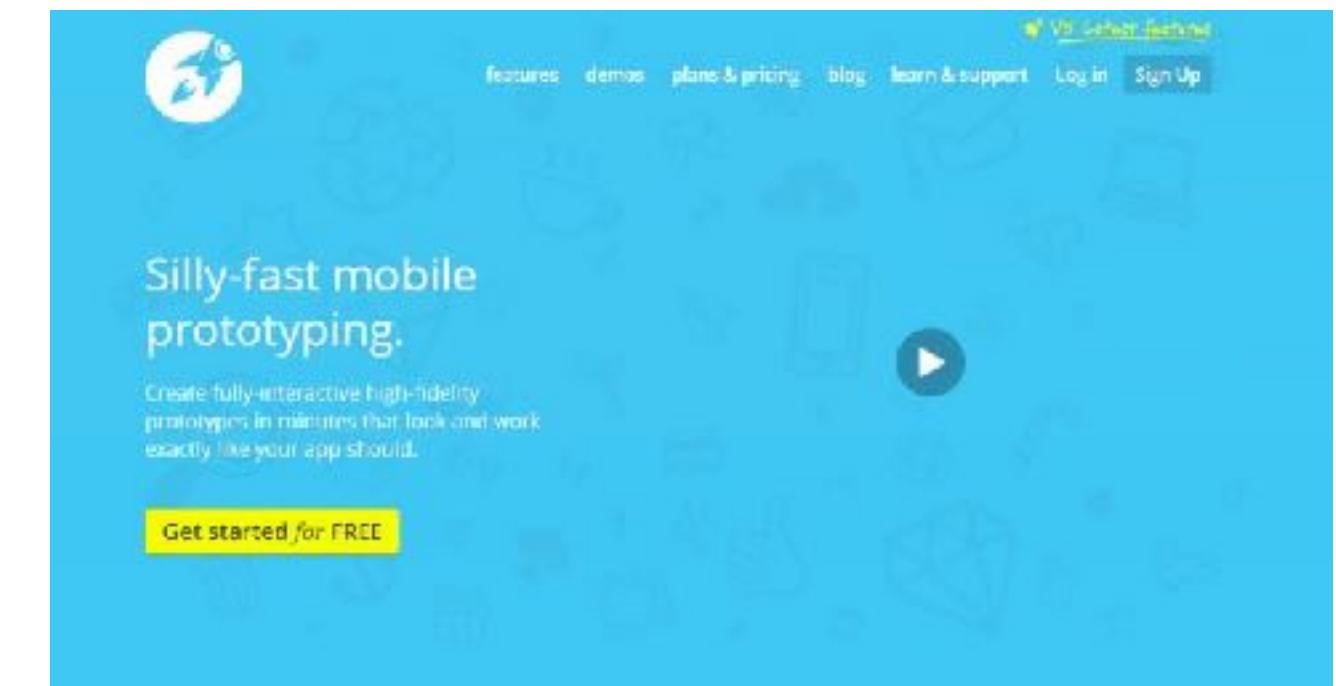
USER-EXPERIENCE
(UX)

INFORMATION
ARCHITECTURE (IA)

VISUAL DESIGN

DEVELOPMENT

USER EXPERIENCE (UX)



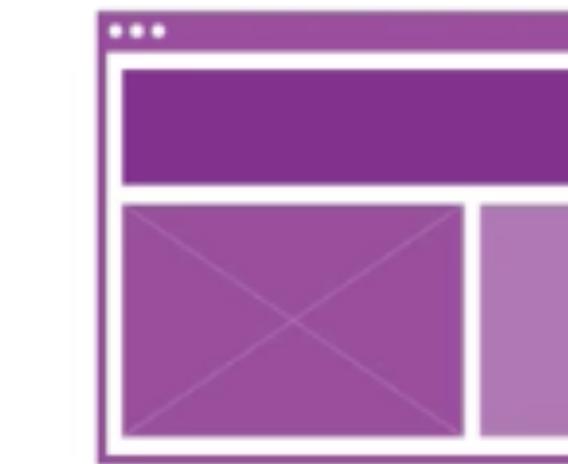
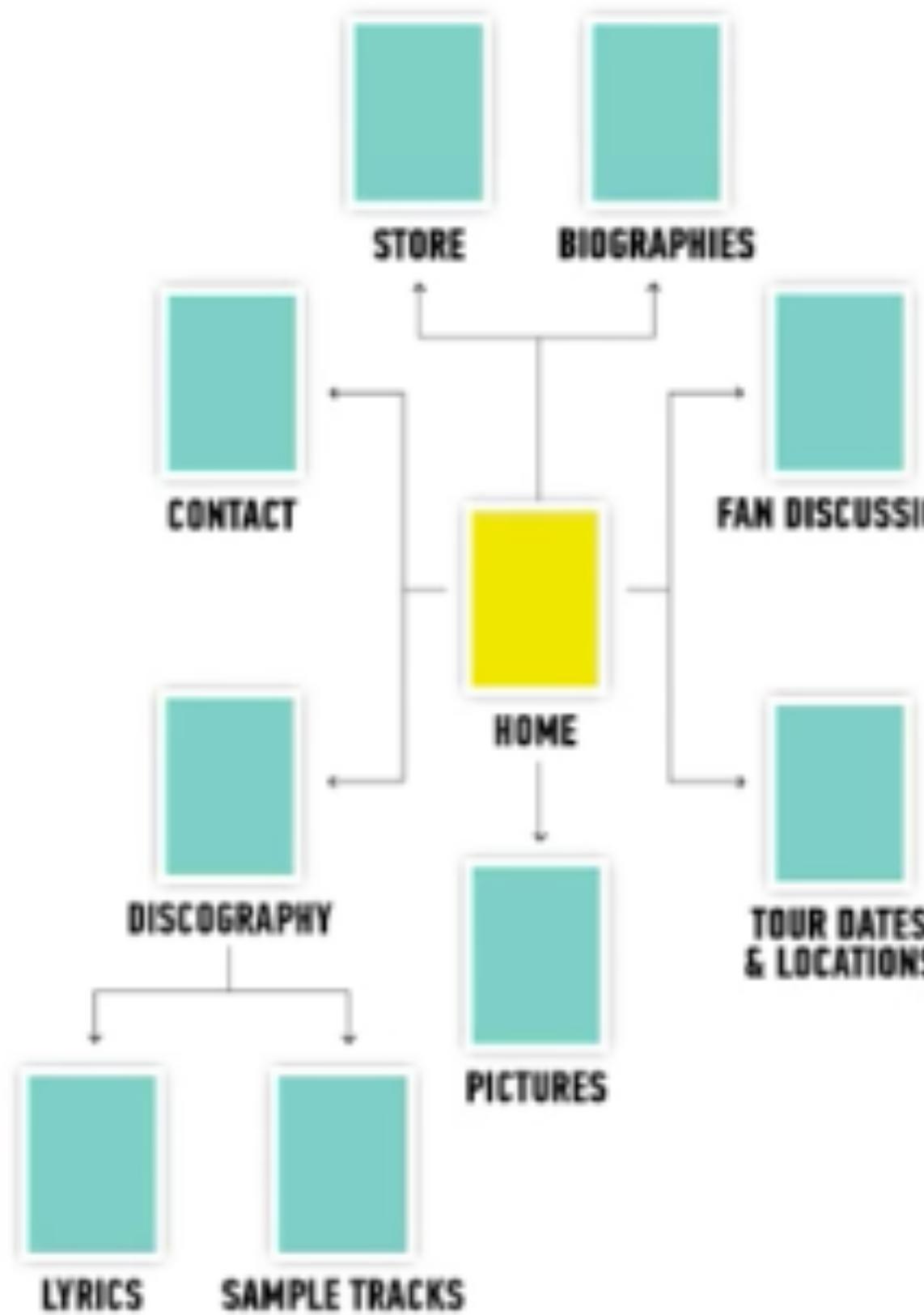
INFORMATION ARCHITECTURE (IA)

(Make a model or blueprint for the site)



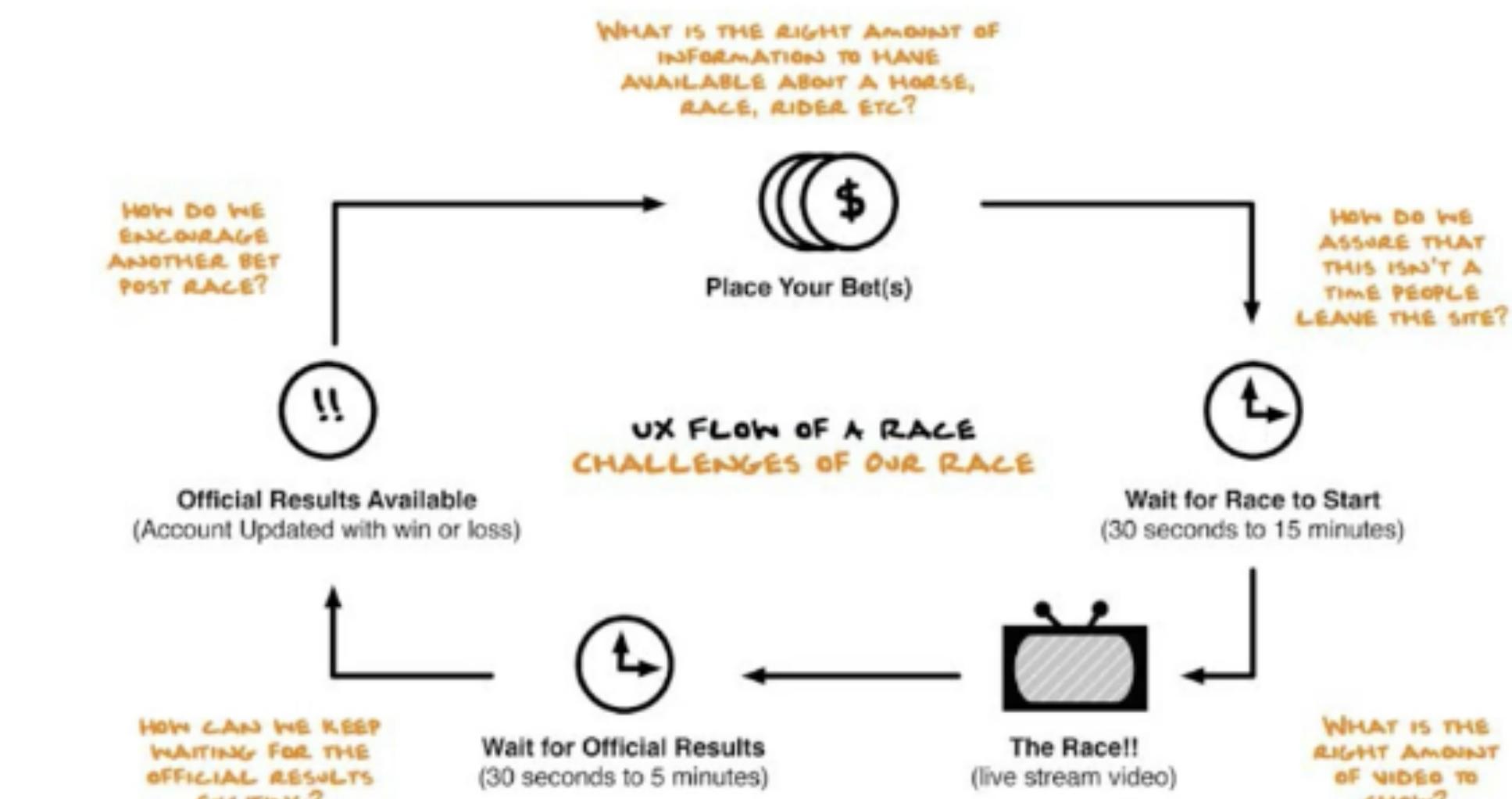
SITEMAPS & FLOW DIAGRAMS

Establish flow and order



WIREFRAMES & CONTENT

Define the user interaction and ease the handoff process to the creative team

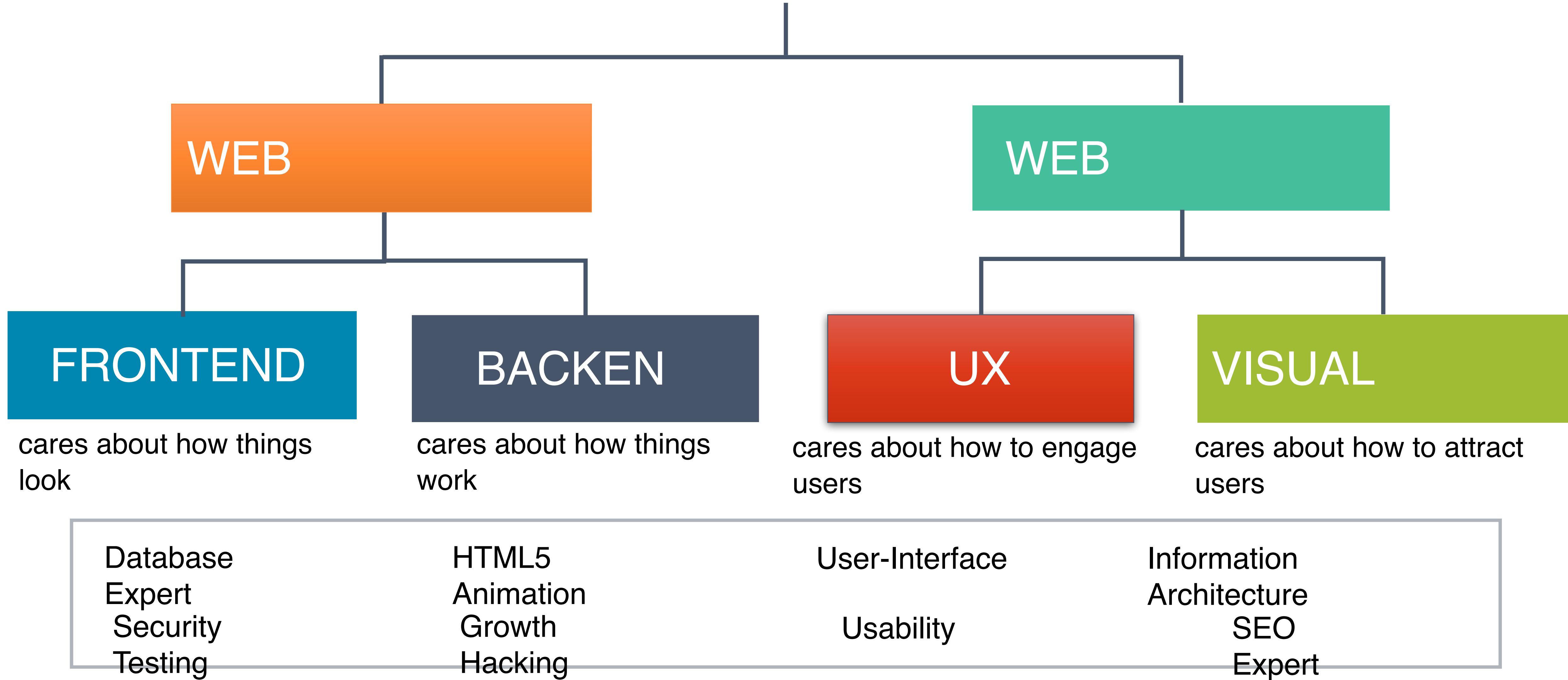


VISUAL DESIGN



The visual designer takes ideas and brings them to life with color, typography, and layout

WEB MASTER



FRONTEND

css

HTML

JS



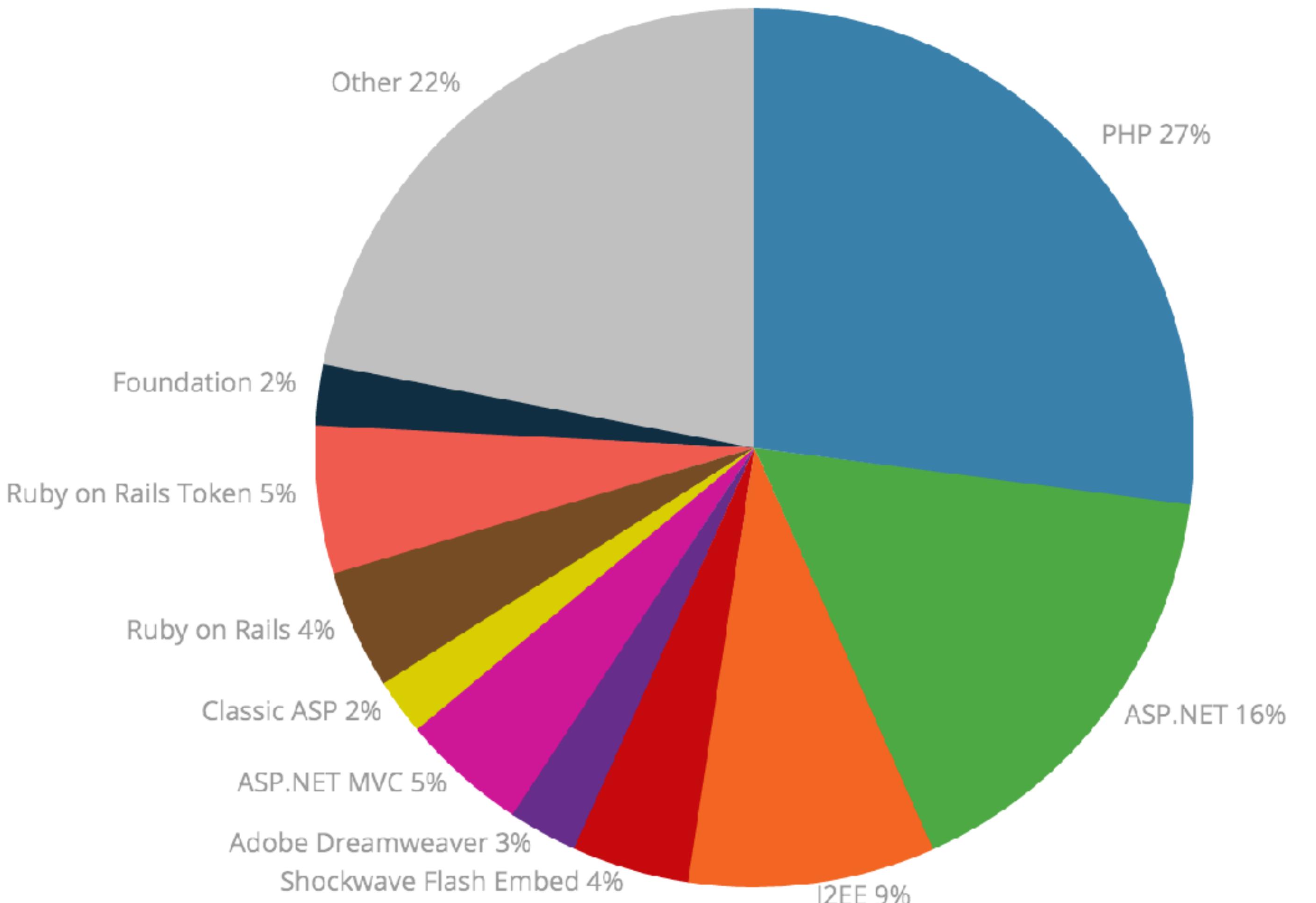
BACKEND

PHP

RUBY

PYTHON

JAVA



The screenshot shows the CakePHP website homepage. It features a prominent "Download" button for version 2.4.6 Stable. Below the download area, there's a section titled "Why use CakePHP?" with four bullet points: "Build Quickly", "No Configuration", "Batteries Included", and "Clean MVC Conventions". Each point has a small icon next to it. At the bottom of the page, there are links for "News", "Interact", "Read + Learn", and a "CakePHP Loves you" section.



The screenshot shows the Ruby on Rails website homepage. It features a large "RAILS" logo at the top. Below it, there's a section with the text "Imagine what you could build if you learned Ruby on Rails..." and a cartoon illustration of a group of people. A red button at the bottom right says "Latest version — Rails 5.0.0 released June 30, 2016".



Django makes it easier to build better Web apps more quickly and with less code.

[Get started with Django](#)

MODERN LANGUAGE WAR: PHP VS RUBY VS PYTHON



BEST FOR HTML PAGES

BEST FOR WEB APP
OF DATA ENTITIES

BEST FOR PRODUCTIVITY



PHP was designed for web development to produce dynamic web pages.



Ruby was designed to make programming fun and flexible for the programmer.



Python was designed to emphasize productivity and code readability.



- C
- PERL
- JAVA
- C++

- TCL

- ADA
- C++
- CLU
- DYLAN

- EIFFEL
- LISP
- PERL
- PYTHON

- ABC
- ALGOL 68
- C
- C++

- ICON
- JAVA
- LISP
- PERL

MODERN LANGUAGE WAR: PHP VS RUBY VS PYTHON



BEST FOR HTML PAGES



BEST FOR WEB APP
OF DATA ENTITIES



BEST FOR PRODUCTIVITY



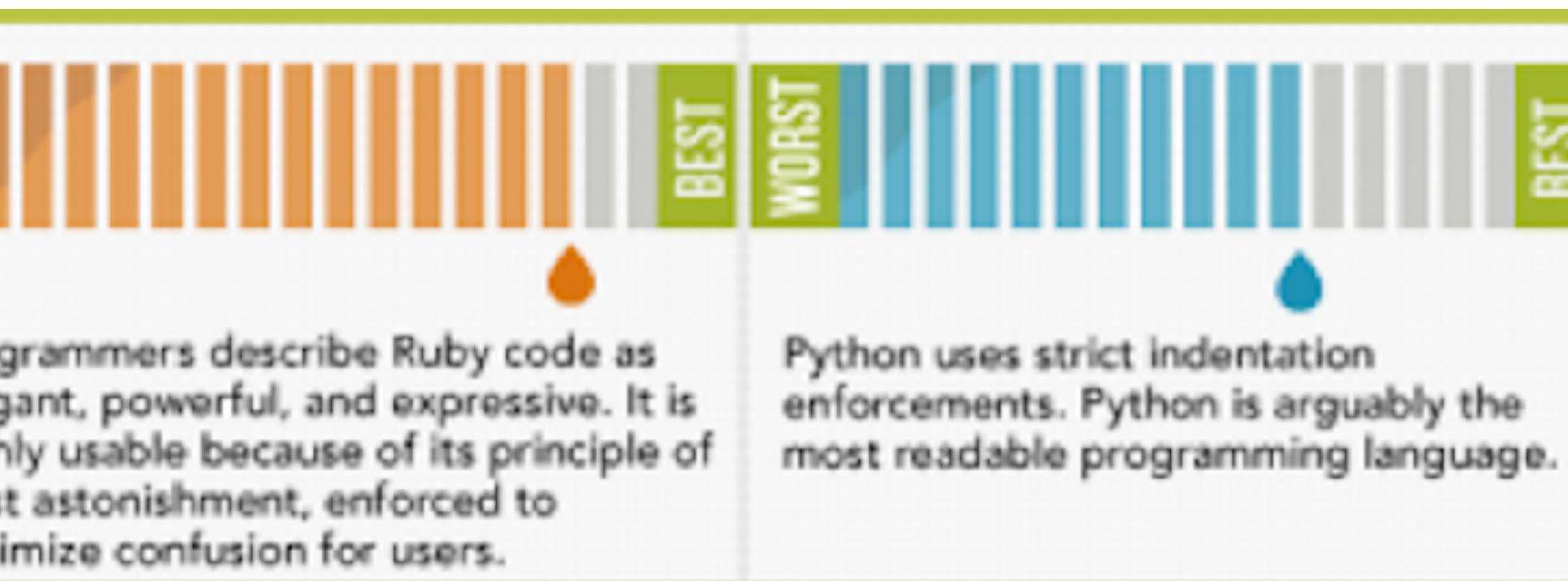
WIKIPEDIA
UDEMY
FACEBOOK

TWITTER
HULU
Groupon

YOUTUBE
GOOGLE



PHP follows a classic approach and is extensively documented.



Programmers describe Ruby code as elegant, powerful, and expressive. It is highly usable because of its principle of least astonishment, enforced to minimize confusion for users.

Python uses strict indentation enforcement. Python is arguably the most readable programming language.

MODERN LANGUAGE WAR: PHP VS RUBY VS PYTHON



BEST FOR HTML PAGES



BEST FOR WEB APP
OF DATA ENTITIES



BEST FOR PRODUCTIVITY

- PHP is the best language for creating HTML pages
- Python is a general purpose programming language. It can be used to build almost anything from web apps, crawlers, daemons and desktop GUI applications.
- Ruby is best at creating web application of data entities quickly so that you can focus on the special functionality rather than on the query operations: insert, update and delete.

DATABASE

MySQL

Mongo DB

PostgreSQL

ORACLE®
DATABASE

Microsoft®
SQL Server™
PostgreSQL

TERADATA.

IBM.
DB2®

SQLite
Apache Derby



MariaDB

MySQL
SYBASE® H2

Access
Apache Derby

HyperSQL

RELATIONAL DB

TABULAR RELATIONS



NON-RELATIONAL DB

KEY-VALUE STORES

redis



riak

Cassandra

Apache
CouchDB

"Time to relax"

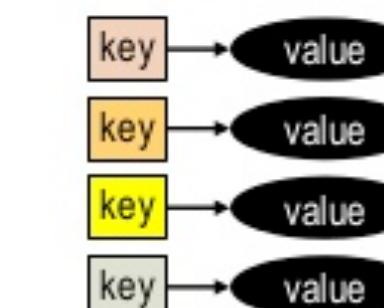
APACHE
HBASE



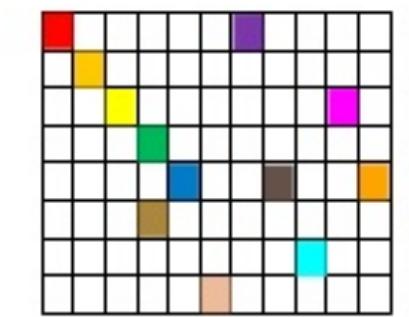
mongoDB

HYPERTABLE INC

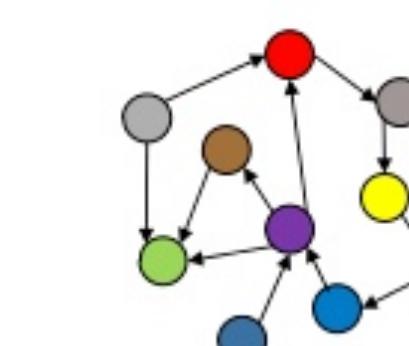
Key-Value



Column-Family



Graph



Document



WEB HOSTING

Pages Help

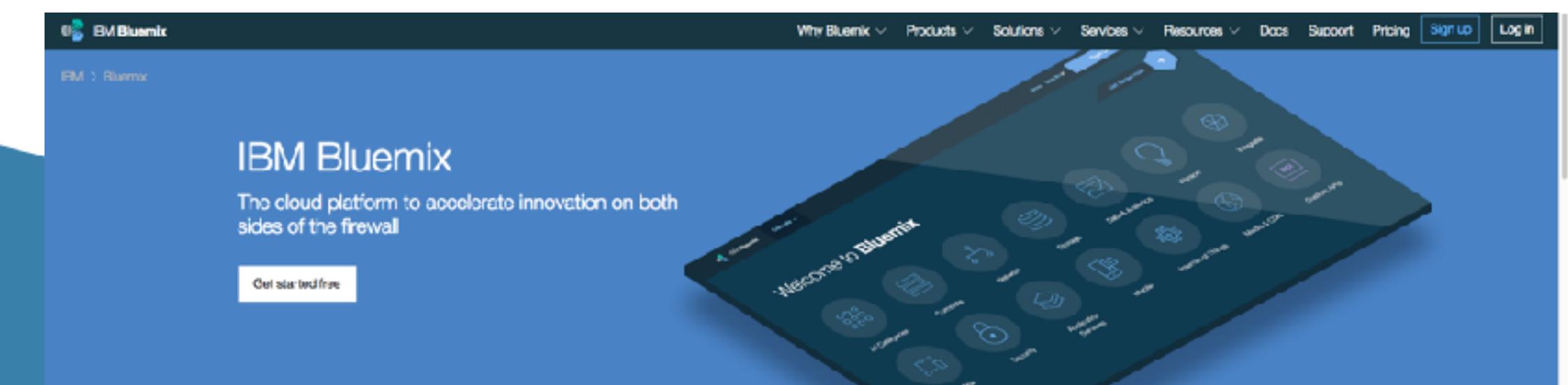
GitHub Pages

Websites for you and your projects.

Hosted directly from your GitHub repository. Just edit, push, and your changes are live.

Roll vanilla, or generate a site for your project to quickly get started.

You get one site per GitHub account and organization, and unlimited project sites. Ready? Let's get started.



IBM Bluemix

Why Bluemix Products Solutions Services Resources Docs Support Pricing Sign up Log in

IBM > Bluemix

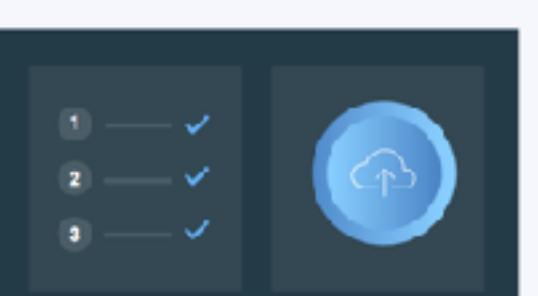
IBM Bluemix

The cloud platform to accelerate innovation on both sides of the firewall

[Get started free](#)

IBM Containers makes Docker enterprise-ready

[Download the PDF](#)



Deploy your first app

Get the top-level resources you need to start immediately.



See what's possible on Bluemix

Gain a deeper understanding of Bluemix through webinars, case studies, and more.

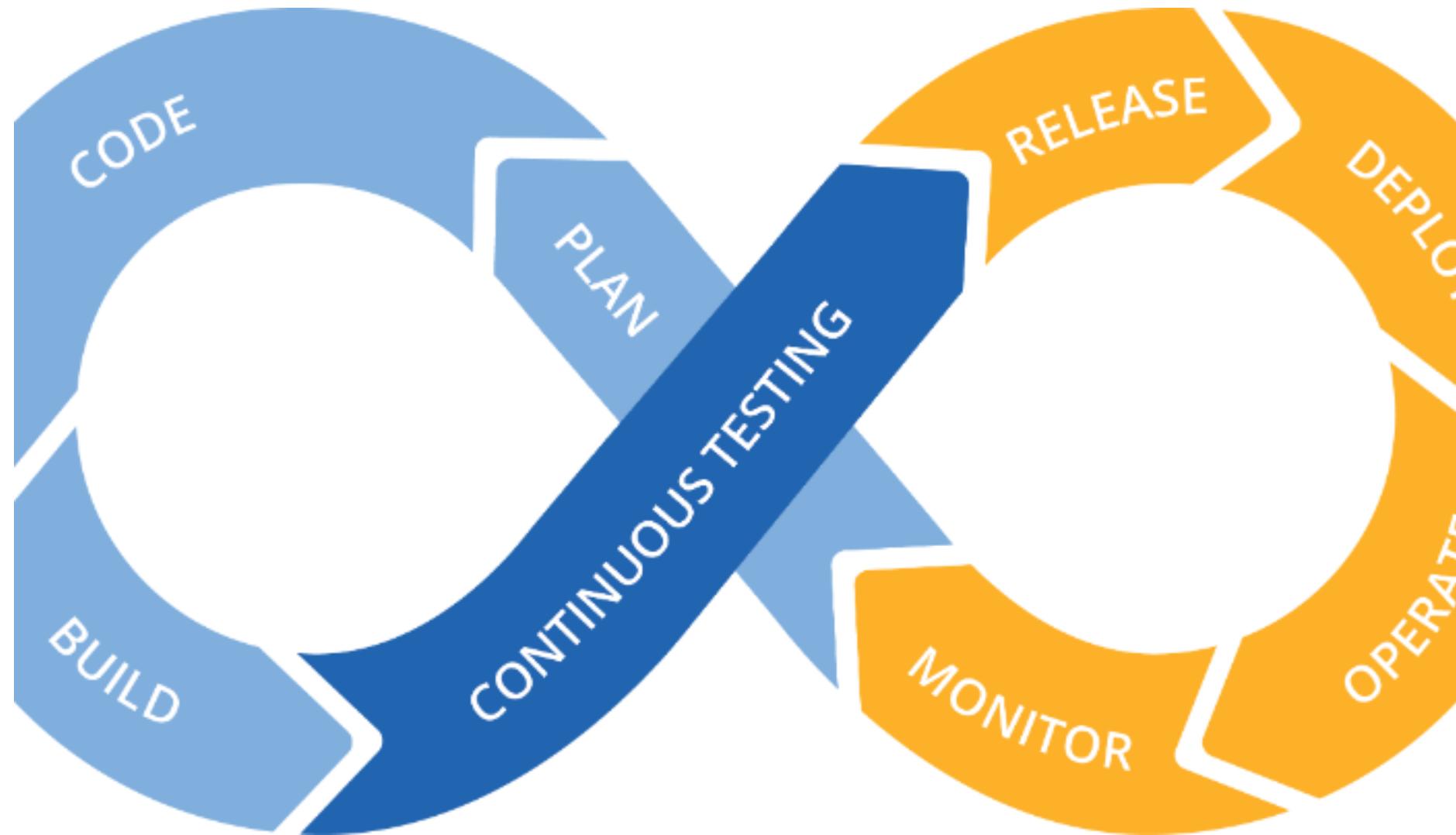


Unlock your data and apps for free

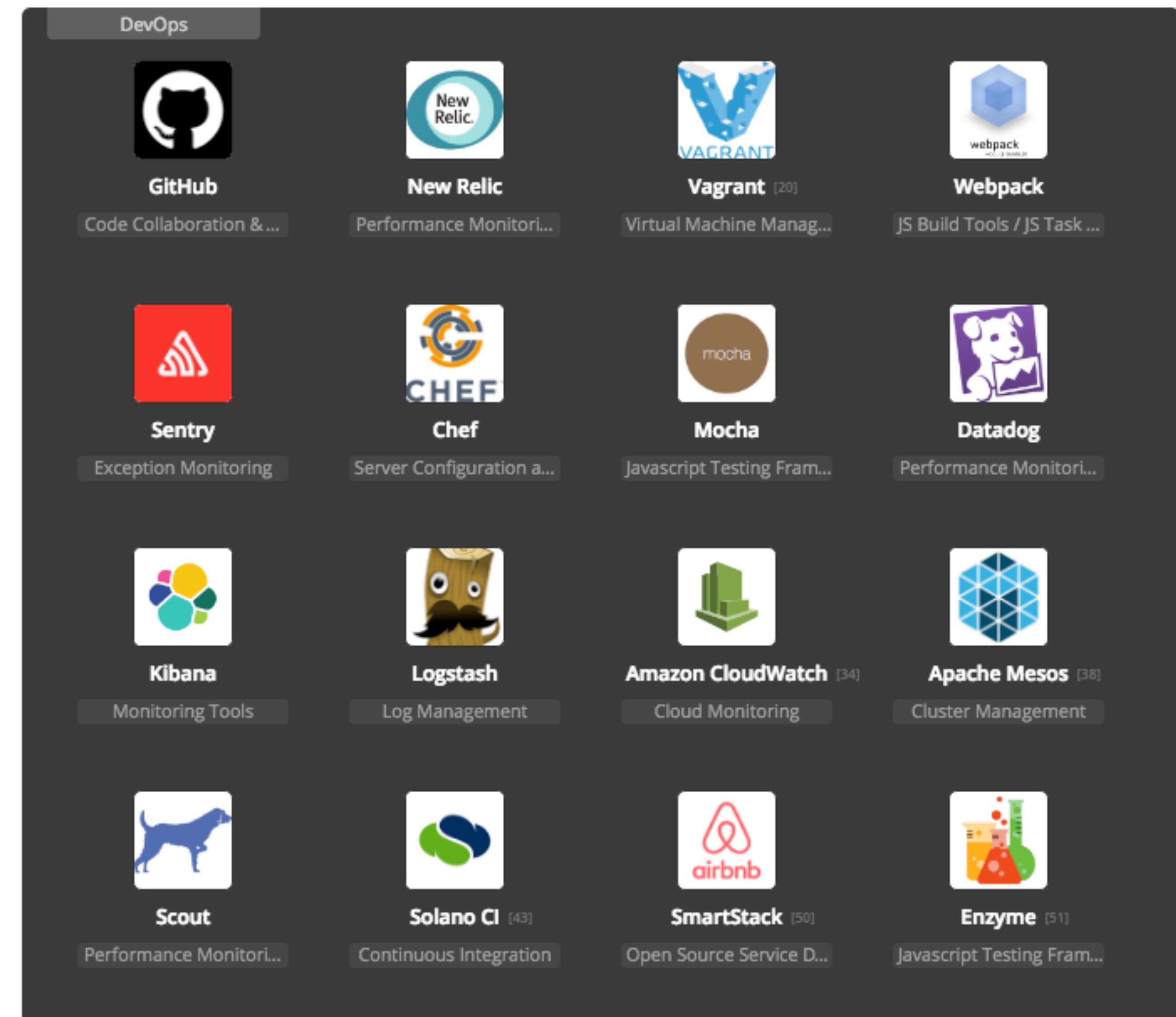
Connect your applications and data sources together at no cost.

 AWS AWS Services Services Edit Edit Marcelo Kamphannal x. virginia support

DevOps ?



DevOps is the practice of operations and development engineers participating together in the entire service lifecycle, from design through the development process to production support.

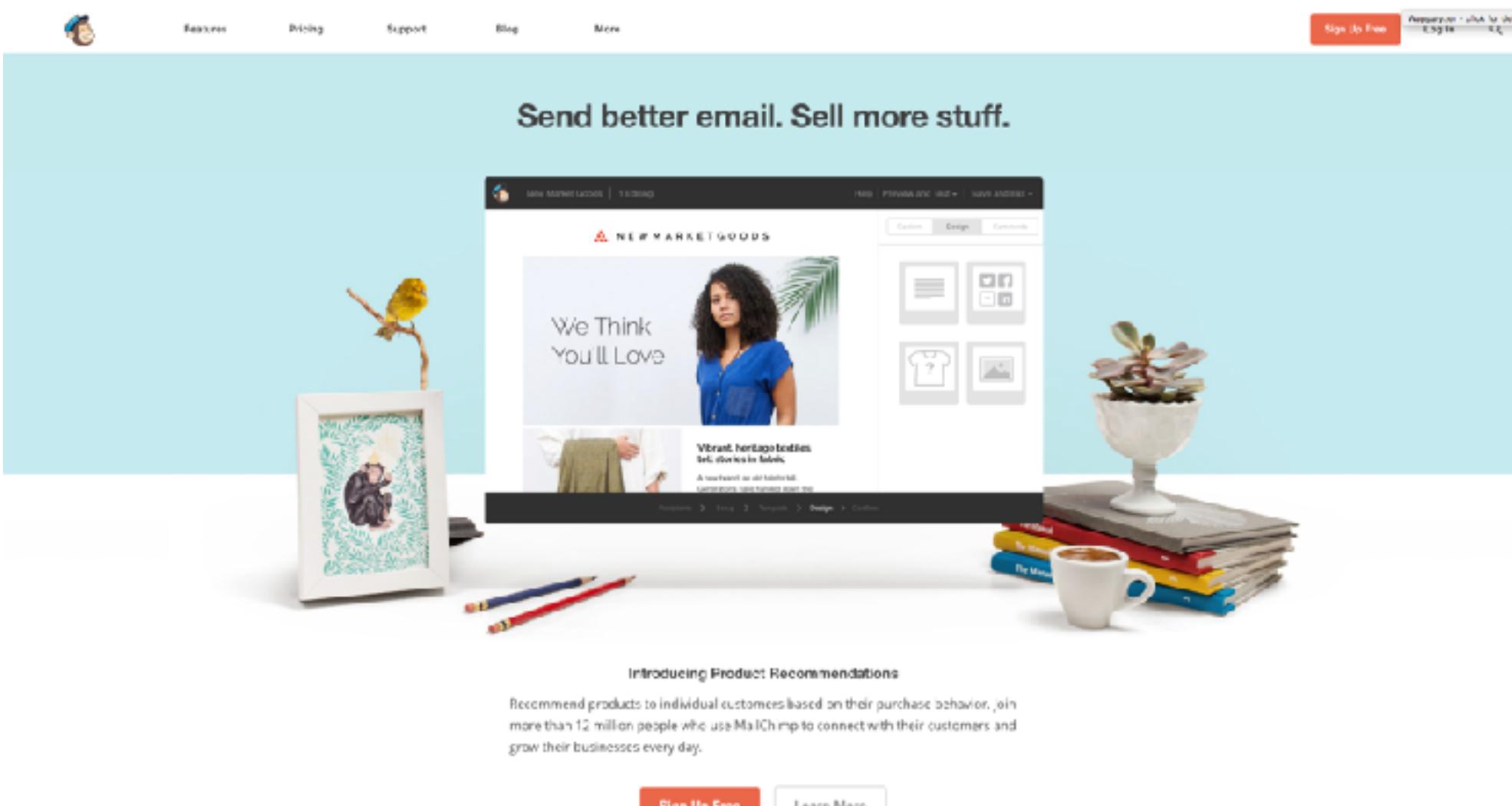


TOP WEBSITES BUILT WITH PHP



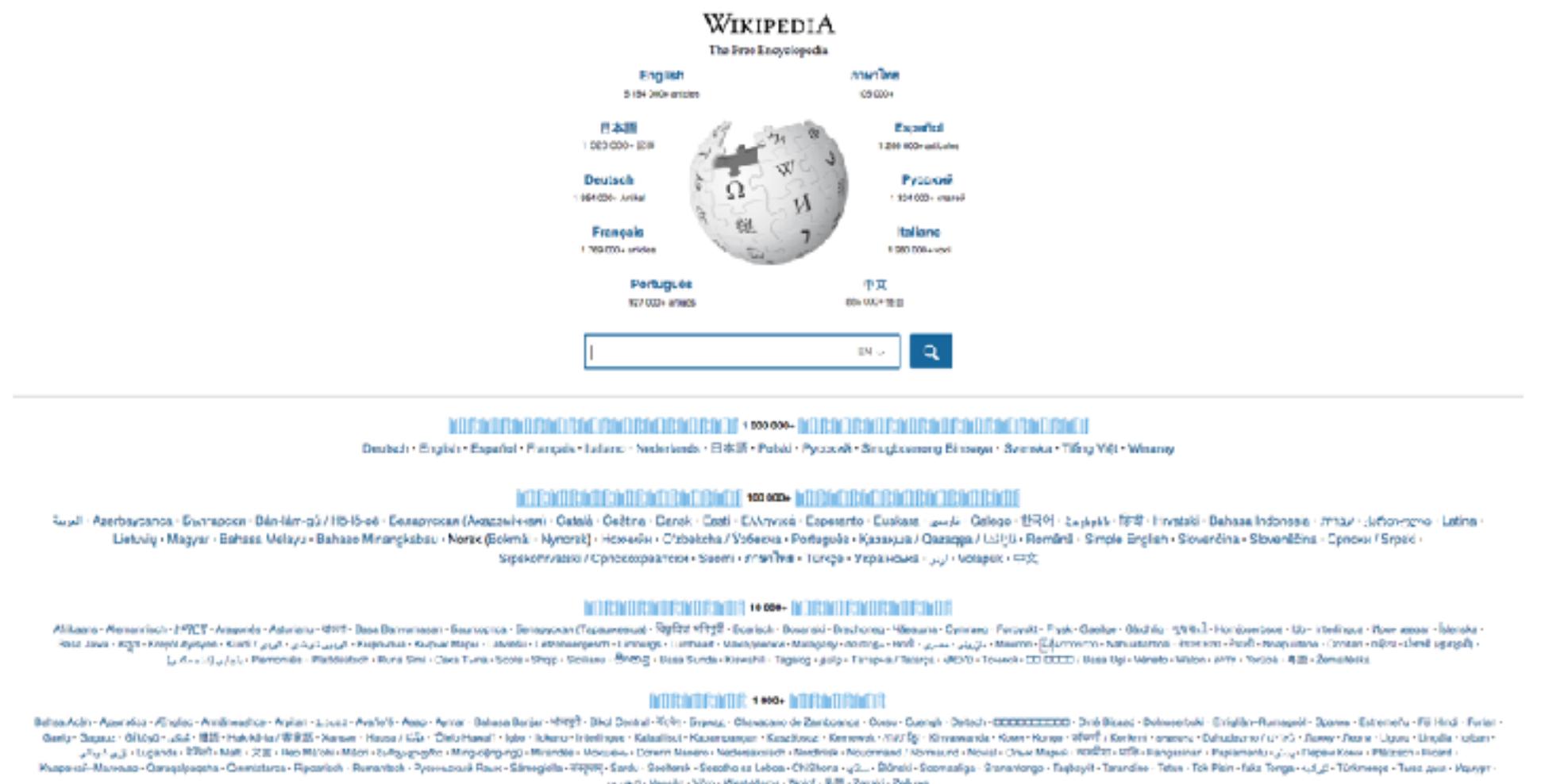
The image shows the Facebook sign-up page. It features a large blue header bar with the word "facebook" in white. Below the header, there's a graphic of a hand giving a thumbs-up with a red heart above it. The main form is titled "Sign Up" and includes fields for "First name", "Surname", "Mobile number or email address", "Re-enter mobile number or email address", and "New password". There are also fields for "Birthday" (Day, Month, Year) and gender (Female, Male). A note at the bottom states: "By clicking Sign Up, you agree to our Terms and that you have read our Data Policy, including our Cookie Use." A green "Sign Up" button is at the bottom right. At the very bottom, there's a link to "Create a Page for a celebrity, band or business". The footer contains links for "Log In", "Messenger", "Facebook Lite", "Help", "Terms", and "Privacy".

FACEBOOK



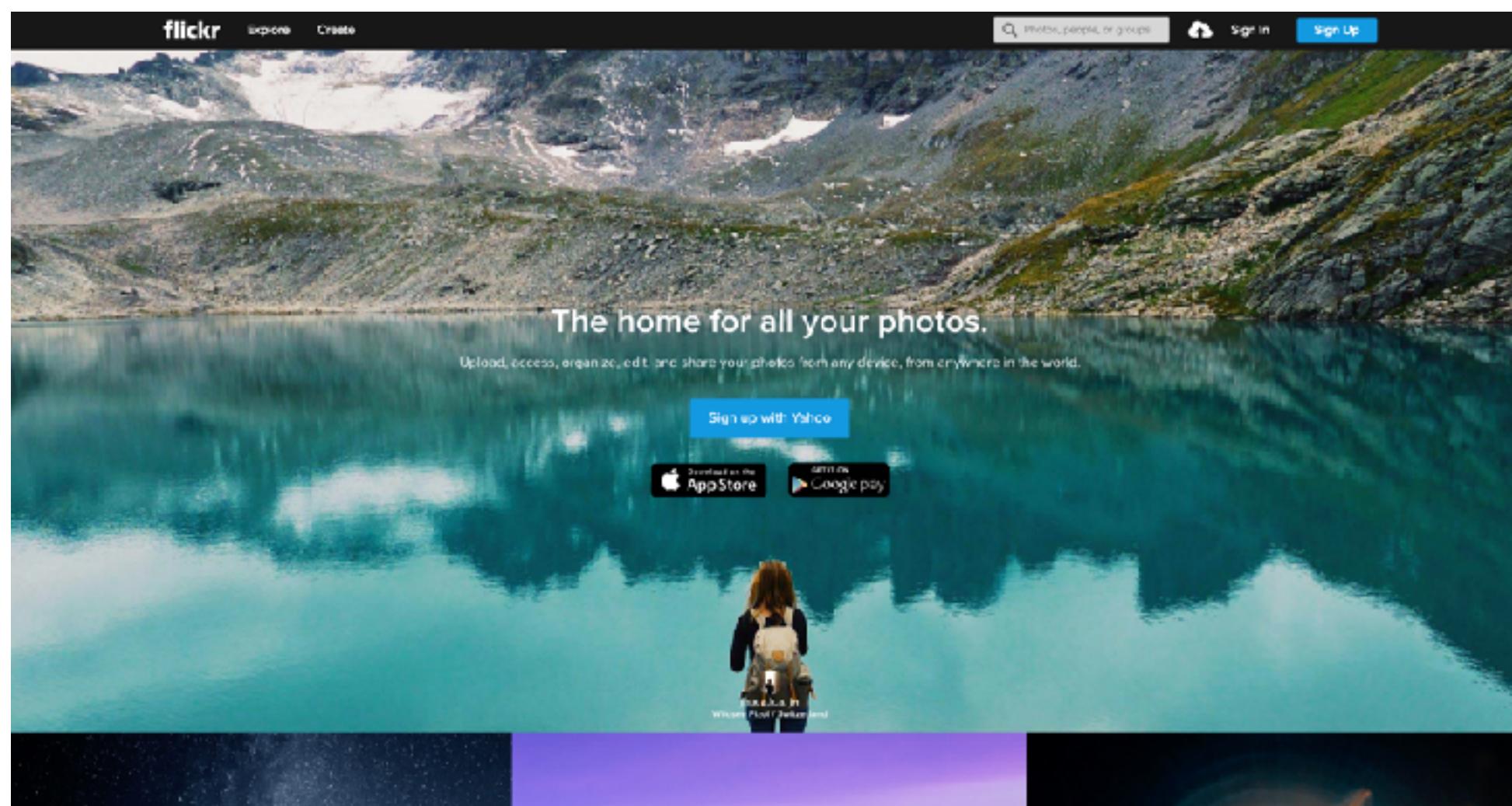
The MailChimp homepage features a light blue header with the brand logo and navigation links for "Business", "Pricing", "Support", "Blog", and "More". The main headline is "Send better email. Sell more stuff." Below this, there's a screenshot of a website builder interface showing a landing page for "NEW MARKET GOODS" with a woman in a blue shirt. The MailChimp logo is overlaid on the screenshot. The page also features a stack of books, a small potted plant, and a cup of coffee. A section titled "Introducing Product Recommendations" explains how the tool helps businesses connect with customers. At the bottom, there's a red "Sign Up Free" button and a "Learn More" link.

MAILCHIMP



The Wikipedia homepage features a large search bar at the top. Below it, there's a section for "Recent changes" with a list of articles. The main content area shows the English Wikipedia homepage with its characteristic globe logo and language links for English, Deutsch, Français, Português, and Italiano. The footer contains links for "About Wikipedia", "Community", "Help", "Privacy policy", "Terms of use", and "Contact us". A note at the bottom states: "Wikimedia Foundation is a non-profit organization." The footer also includes links for various languages like Azerbaijani, Belarusian, Bulgarian, Czech, Danish, German, Hebrew, Hungarian, Indonesian, Italian, Japanese, Korean, Polish, Portuguese, Russian, Spanish, Swedish, Turkish, and Vietnamese.

WIKIPEDIA



The Flickr homepage features a large, scenic image of a turquoise lake surrounded by mountains. The text "The home for all your photos." is overlaid on the image. Below the image, there's a "Sign up with Yahoo!" button and links for "Available on the App Store" and "Available on Google Play". The footer contains a "Who's this?" link and a "Logout" button.

FLICKR

TOP WEBSITES BUILT WITH RUBY

The Indiegogo homepage features a top banner with three projects: a white cylindrical device, a colorful mural, and a person interacting with a device labeled "Energy KODIAK". Below this, a sidebar displays "Top picks for you" and a grid of featured projects including "FLI CHARGE", "AERIAL CAMERA", "MAX PUMP", and "Roidmi". A large central section shows more projects like "FLASH SALE: 12 HOURS ONLY" and "THIS SUMMER YOU NEED MAX PUMP".

INDIEGOGO

The Airbnb homepage features a video of a smiling man and the text "LIVE THERE". It includes a search bar and a section titled "Hosting opens up a world of opportunity" with a photo of three people in a room.

AIRBNB

The Bloomberg homepage features a top banner with the text "Australia Thrown Into Limbo as Voters Erase Turnbull Majority". Below this is a "Top News" section with headlines like "20 Hostages Killed, 13 Saved in Bangladesh Restaurant Attack" and "Everyone's a Winner in Brexit Aftermath After Doves Rescue Market". A sidebar on the left shows "CURRENCY WOES" and a "LIVETV" feed.

BLOOMBERG

The Shopify homepage features a large image of a person sewing and the text "Every great business starts with an idea". It includes a call-to-action "Enter your email address" and "Start your free trial". Below this are sections for "Build your brand with your very own online store" and "Sell your products everywhere, from websites to mobile apps".

SHOPIFY

TOP WEBSITES BUILT WITH PYTHON

The screenshot shows the TechCrunch YouTube channel page. The channel has 198,467 subscribers. The main feed displays several video thumbnails, including "Parrot's Marcellus Bennett releases Hey A.J. app" and "Walmart Expands Two-Day Delivery". The sidebar features "Featured Channels" like Newy Tech, TechGeekery, and Engadget, and "Related channels" such as CNET, The Verge, and Engadget.

YOUTUBE

The screenshot shows the Wersdom website, which is heavily built with Python. It features a search bar at the top and a grid of various articles and images. Some visible content includes "How To Quickly Open a Padlock Using a Pair of Nut Wrenches", "Python Cheat Sheet", and "How To Make Your Raspberry Pi Glitch". The site uses a clean, modern design with a mix of text, images, and infographics.

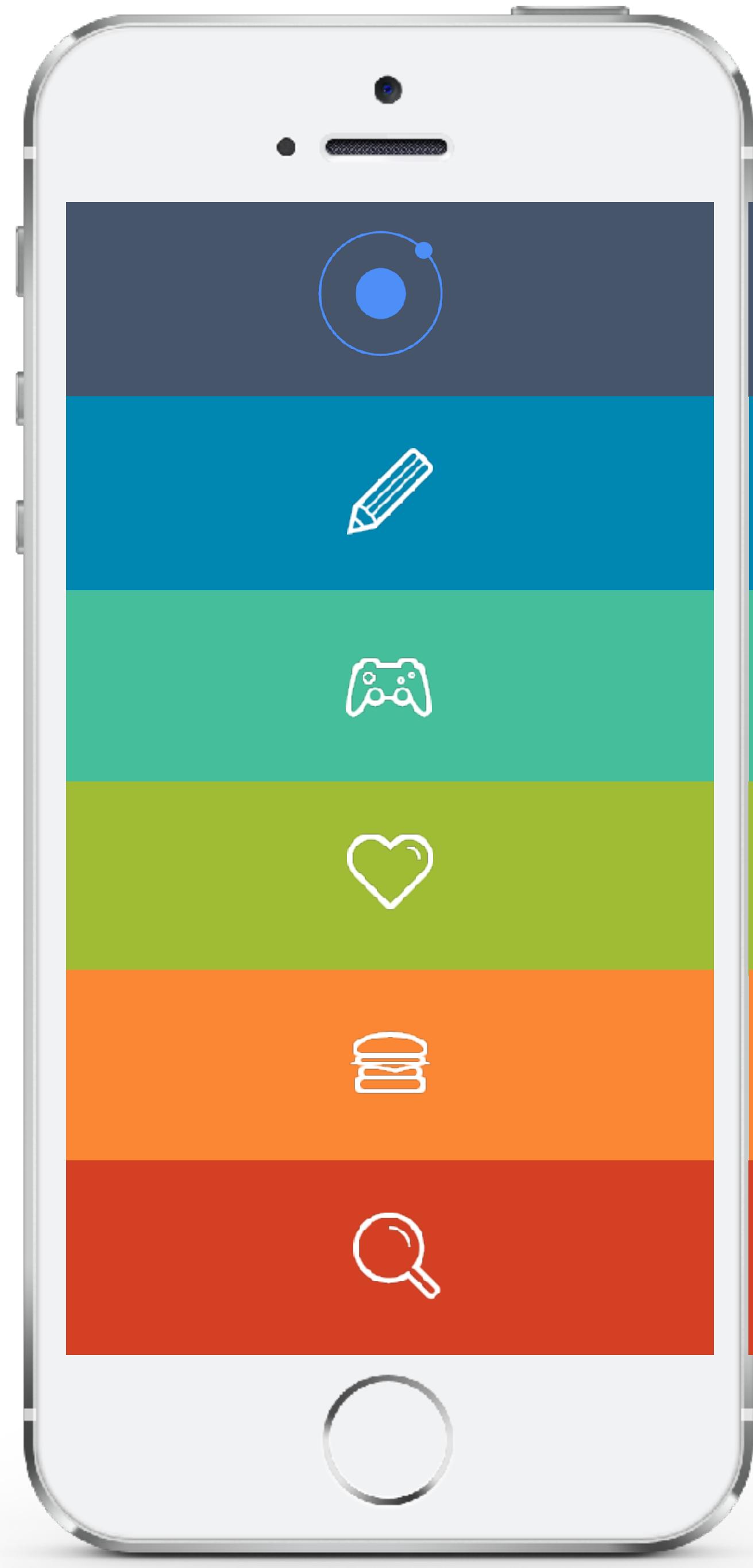
PINTEREST

The screenshot shows the Spotify desktop application interface. A search for "nina simone" has been performed, displaying her profile picture and a list of 40 essential hits. The list includes tracks like "Tomorrow (We Will Meet Again)", "My Baby Just Cares For Me", and "Soul Man". The Spotify logo is visible in the top right corner.

SPOTIFY

The screenshot shows the Doordash website. The main headline reads "Sort by yum." and features a background image of various food items. Below the headline, there is a section for "Introducing Spotify social" with the tagline "Sharing has never been so easy." A delivery address input field and a "Find Restaurants" button are also visible.

DOORDASH



• CROSS

ionic

FRAMEWORK 7

NATIVE SCRIPT

REACT NATIVE

ONSEN UI

FAMOUS

MOBILE

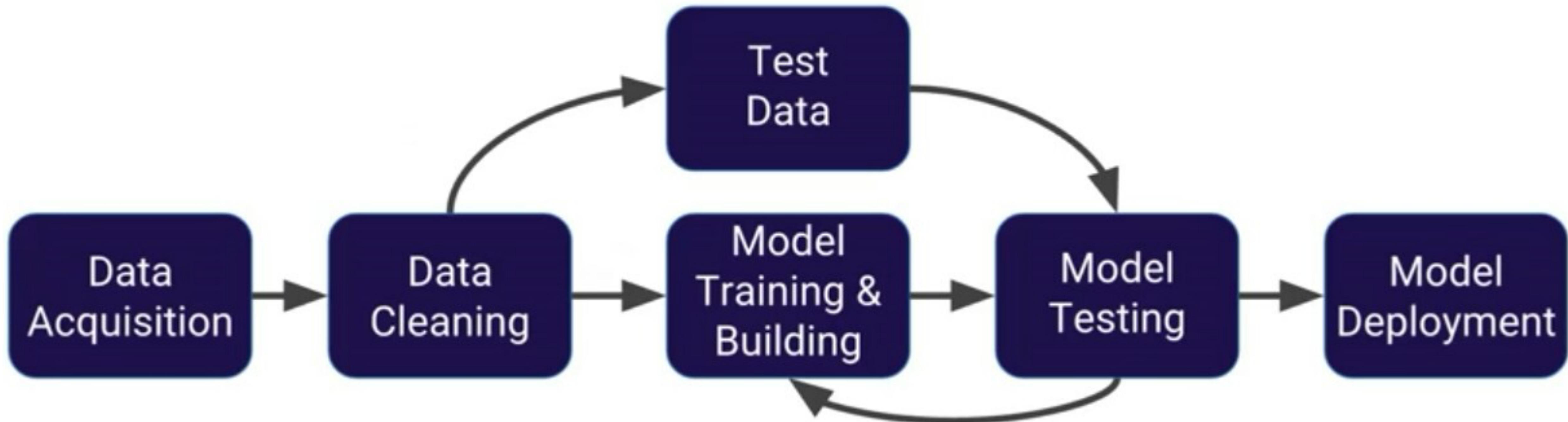


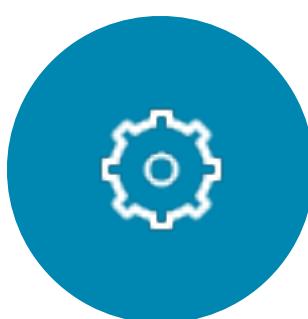
• NATIVE APPS

Framework	Native Look and Feel	Prerequisites	Community	Docs	Tools
Ionic	7/10	AngularJS (optional)	9/10	8/10	Powerful CLI, Ionic SDK
Onsen UI	6/10	AngularJS (optional)	4/10	9/10	Monaca Cloud IDE (has free plan)
Framework 7	8/10	HTML, CSS and JS only	6/10	8/10	None
React Native	8/10	React	8/10	5/10	React Developer Tools extention for Chrome
jQuery Mobile	3/10	jQuery	8/10	5/10	None
Native Script	8/10	JavaScript	5/10	9/10	Free CLI, other paid options
Famous	7/10	WebGL, AngularJS	3/10	5/10	None

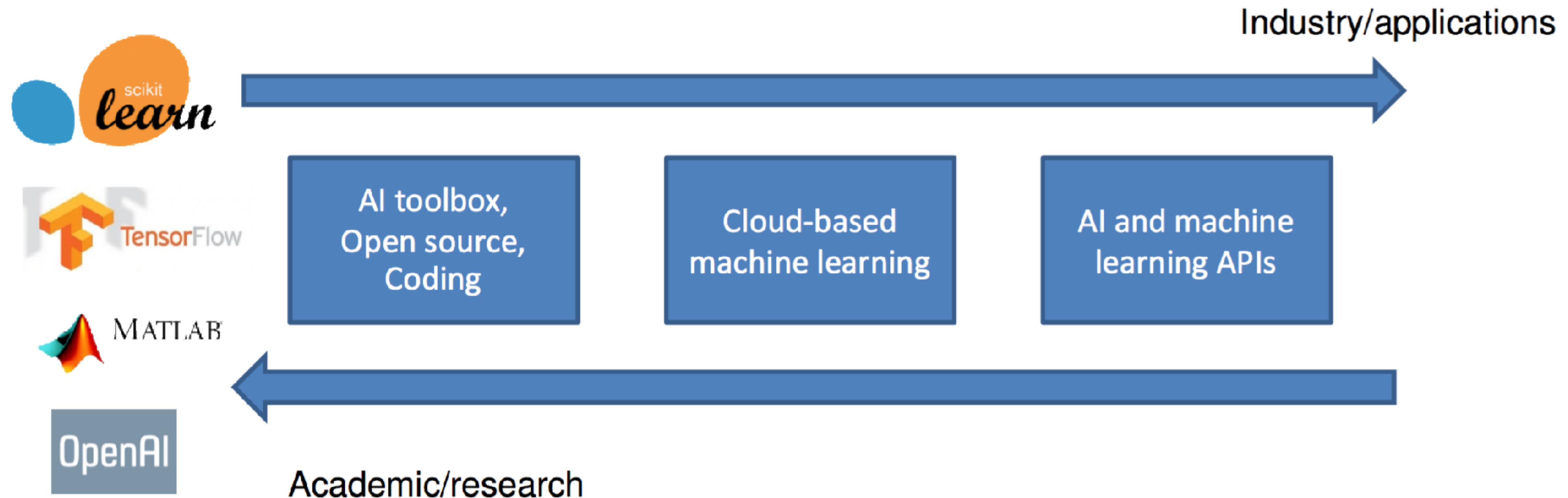


MACHINE LEARNING PROCESS





MACHINE LEARNING PROCESS



Github Trends

Trending in open source

See what the GitHub community is most excited about this week.

Repositories

Developers

Trending: this week ▾

caffe2 / caffe2

Caffe2 is a lightweight, modular, and scalable deep learning framework.

● Jupyter Notebook ★ 3,934 ⚡ 680 Built by 

★ 3,123 stars this week

jakevdp / PythonDataScienceHandbook

Jupyter Notebooks for the Python Data Science Handbook

● Jupyter Notebook ★ 4,493 ⚡ 1,177 Built by 

★ 105 stars this week

ageron / handson-ml

A series of Jupyter notebooks that walk you through the fundamentals of Machine Learning and Deep Learning in python using Scikit-Learn and TensorFlow.

● Jupyter Notebook ★ 701 ⚡ 290 Built by 

★ 81 stars this week

CamDavidsonPilon / Probabilistic-Programming-and-Bayesian-Methods-for-Hackers

aka "Bayesian Methods for Hackers": An introduction to Bayesian methods + probabilistic programming with a computation/understanding-first, mathematics-

Languages

Java

587

Python

568

C++

253

Groovy

118

JavaScript

107

Jupyter Notebook

Lua

69

Python

58

⋮ Other: Languages ▾

ProTip! Looking for most forked
Jupyter Notebook repositories?
[Try this search](#)

C

37

Ruby

32

Prolog

19

TeX

ACADEMIC ML TOOLS



Products Solutions Academia Support Community Events

Contact us How to buy Buy it

Machine Learning with MATLAB

Search MathWorks.com

Overview Examples

Contact sales Trial software



Choosing the Best Classification Model and Avoiding Overfitting

» Download white paper

Explore Products for Machine Learning

Statistics and Machine Learning Toolbox™

Neural Network Toolbox™

Computer Vision System Toolbox™

Fuzzy Logic Toolbox™

With MATLAB®, you have immediate access to prebuilt functions, extensive toolboxes, and specialized apps for **classification, regression, and clustering**.



OPEN-SOURCE ML TOOLS

scikit learn

Home Installation Documentation Examples

Google™ Custom Search

Search X

scikit-learn
Machine Learning in Python

- Simple and efficient tools for data mining and data analysis
- Accessible to everybody, and reusable in various contexts
- Built on NumPy, SciPy, and matplotlib
- Open source, commercially usable - BSD license

Classification

Identifying to which category an object belongs to.

Applications: Spam detection, Image recognition.

Algorithms: SVM, nearest neighbors, random forest, ...

[— Examples](#)

Regression

Predicting a continuous-valued attribute associated with an object.

Applications: Drug response, Stock prices.
Algorithms: SVR, ridge regression, Lasso, ...

[— Examples](#)

Clustering

Automatic grouping of similar objects into sets.

Applications: Customer segmentation, Grouping experiment outcomes

Algorithms: k-Means, spectral clustering, mean-shift, ...

[— Examples](#)



OPEN-SOURCE ML TOOLS

What is scikit-learn?

Scikit-learn provides a range of supervised and unsupervised learning algorithms via a consistent interface in Python. It is licensed under a permissive simplified BSD license and is distributed under many Linux distributions, encouraging academic and commercial use. This is stack that includes:

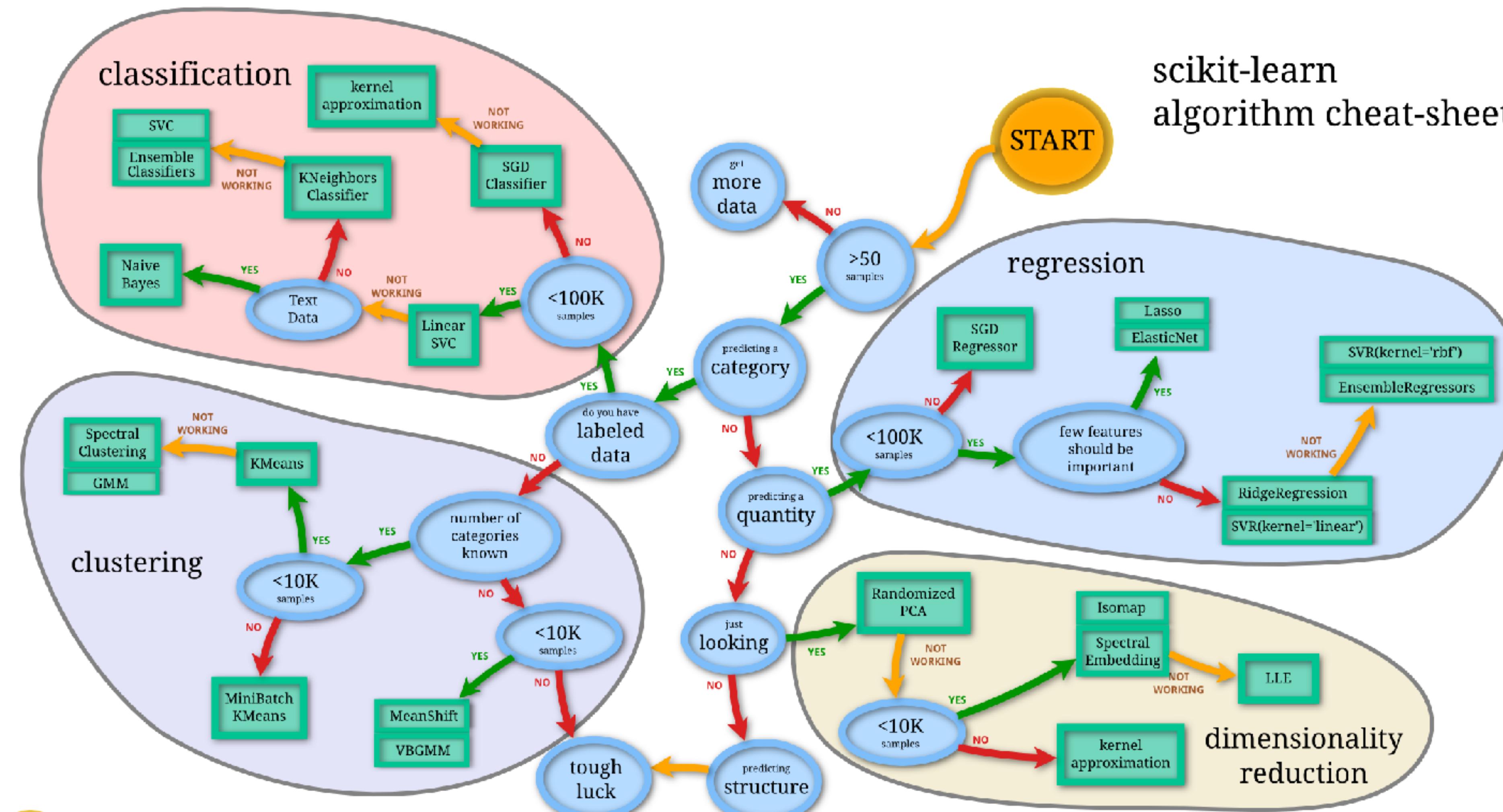


- **NumPy**: Base n-dimensional array package
- **SciPy**: Fundamental library for scientific computing
- **Matplotlib**: Comprehensive 2D/3D plotting
- **IPython**: Enhanced interactive console
- **Sympy**: Symbolic mathematics
- **Pandas**: Data structures and analysis



OPEN-SOURCE ML TOOLS

scikit-learn
algorithm cheat-sheet





OPEN-SOURCE ML TOOLS

Regression

Models

- Linear regression
- Regularization:
Ridge (L2), Lasso (L1)

Algorithms

- Gradient descent
- Coordinate descent

Concepts

- Loss functions, bias-variance tradeoff, cross-validation, sparsity, overfitting, model selection



OPEN-SOURCE ML TOOLS

Classification

Models

- Linear classifiers
(logistic regression, SVMs, perceptron)
- Kernels
- Decision trees

Algorithms

- Stochastic gradient descent
- Boosting

Concepts

- Decision boundaries, MLE, ensemble methods, random forests, CART, online learning



machine learning in Python

Source:Machine Learning Specialization , Emily Fox & Carlos Guestrin



OPEN-SOURCE ML TOOLS

Clustering and Retrieval

Models

- Nearest neighbors
- Clustering, mixtures of Gaussians
- Latent Dirichlet allocation (LDA)

Algorithms

- KD-trees, locality-sensitive hashing (LSH)
- K-means
- Expectation-maximization (EM)

Concepts

- Distance metrics, approximation algorithms, hashing, sampling algorithms, scaling up with map-reduce



GETTING STARTED WITH SCIKIT-LEARN



ANACONDA[®]

ACCELERATE

Time-to-Value



INNOVATE faster through managed agile experimentation

MOVE from analysis to deployment immediately

DELIVER high performance analytics processing



CONNECT

Data, Analytics & Compute



LEVERAGE innovative open source analytics to extract value from data

MAXIMIZE your computational power to easily analyze all your data

CONNECT and integrate all your data sources for predictive models

EMPOWER

Data Science Teams



ITERATE quickly to create powerful analysis and predictive models

COLLABORATE and share with your data science team

PUBLISH interactive results to the business



CLOUD-BASED ML TOOLS



Amazon Machine Learning

Amazon Machine Learning makes it easy for developers of all skill levels to use machine learning (ML) technology. Amazon Machine Learning is a managed service for building ML models and generating predictions that enable the development of robust, scalable smart applications.

[Get started](#)

AWS ML

The image shows the Microsoft Azure homepage. At the top left, there's a red life preserver icon. The main title "Microsoft Azure" is in blue. On the right, there are links for "SALES 1-800-667-1309 ▾" and "MY ACCOUNT". Below the header is a navigation bar with links: "Why Azure", "Solutions", "Products" (which is highlighted in blue), "Documentation", "Pricing", "Partners", "Blog", "Resources", and "Support". The main content area features a large photograph of a man with a beard and a woman looking at a screen together. Overlaid on the photo is the text "Machine Learning" in large white letters, followed by "Powerful cloud based analytics, now part of Cortana Intelligence Suite" in smaller white text. At the bottom left is a green button with the text "Get started now >".

MS Azure ML

The screenshot shows the BigML homepage. At the top left is the BigML logo. The top navigation bar includes links for PRIVATE DEPLOYMENTS, EVENTS, GALLERY, DOCUMENTATION, HELP & SUPPORT, and a LOGIN dropdown. To the right of the login is a blue 'AU' icon. A large banner in the center says 'Single Platform for All Predictive Use Cases' and 'Machine Learning built for Developers'. Below this is a green button with 'sign up here' and a note 'Instant access. No credit card required.' To the right is a grey box for 'FREE PRO Subscription' with a graduation cap icon, followed by a yellow shield icon with a 'P'.

This screenshot shows a terminal window running a script named 'BigML-GAS example'. The script uses the 'bigmler' command to train a model on the 'arrhythmia.csv' dataset. It then creates a new dataset 'arrhythmia-new-fields.json', scores it, and outputs the results. The terminal also shows commands for analyzing the dataset, creating a report, and clustering data. To the right of the terminal are three windows from the BigML platform: a 'HOSPITAL' dashboard showing admissions and air pollution data, a 'BigML' dashboard showing a telecom dataset model, and a 'Project: All' dashboard showing a workflow completed with various icons and charts.

BIG ML

turi create intelligence™

RECOMMENDER

SENTIMENT ANALYSIS

CHURN PREDICTOR

DATA MATCHING

CLICKTHROUGH PREDICTOR

LEAD SCORING

TURI ML

DEEP LEARNING

	Languages	Tutorials and training materials	CNN modeling capability	RNN modeling capability	Architecture: easy-to-use and modular front end	Speed	Multiple GPU support	Keras compatible
Theano	Python, C++	++	++	++	+	++	+	+
Tensor-Flow	Python	+++	+++	++	+++	++	++	+
Torch	Lua, Python (new)	+	+++	++	++	+++	++	
Caffe	C++	+	++		+	+	+	
MXNet	R, Python, Julia, Scala	++	++	+	++	++	+++	
Neon	Python	+	++	+	+	++	+	
CNTK	C++	+	+	+++	+	++	+	

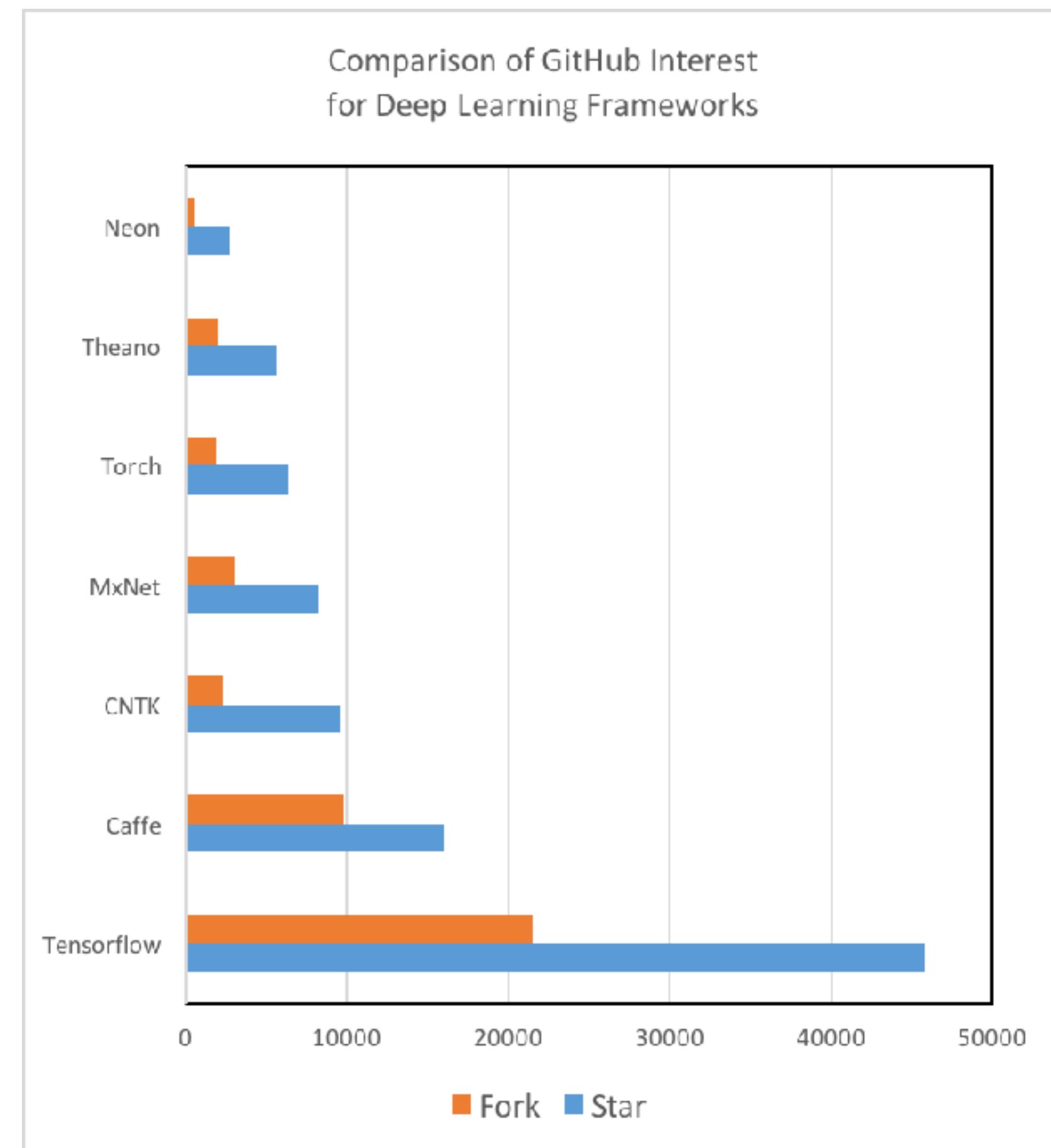
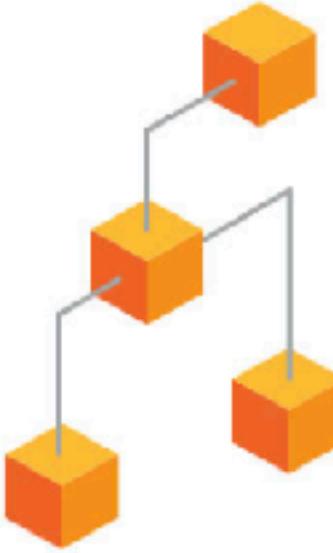


Image recognition, Recommendation engines, Natural language processing, Speech Recognition, Time series prediction, Image captioning ...

An open-source software library
for Machine Intelligence

GET STARTED



TensorFlow 1.0 has arrived!

We're excited to announce the release of TensorFlow 1.0! Check out the migration guide to upgrade your code with ease.

[UPGRADE NOW](#)

Dynamic graphs in TensorFlow

We've open-sourced TensorFlow Fold to make it easier than ever to work with input data with varying shapes and sizes.

[LEARN MORE](#)

The 2017 TensorFlow Dev Summit

Thousands of people from the TensorFlow community participated in the first flagship event. Watch the keynote and talks.

[WATCH VIDEOS](#)

Microsoft Cognitive Services

Give your apps a human side



Vision

Computer Vision
Content Moderator
Emotion
Face
Video
Video Indexer



Speech

Bing Speech
Speaker Recognition



Language

Bing Spell Check
Linguistic Analysis
Text Analytics
Translator Text & Speech
Web Language Model



Knowledge

Academic Knowledge
Entity Linking
Knowledge Exploration
Recommendations
QnA Maker



Search

Bing Autosuggest
Bing Image Search
Bing News Search
Bing Video Search



Labs

Project Prague (gesture)
Project Cuzco (events)
Project Johannesburg (routing)
Project Nanjing (isochrones)
Project Abu Dhabi (distance matrix)
Project Wollongong

CUSTOMIZATION

Custom Vision Service

Custom Speech Service

Language Understanding

Custom Decision Service

Bing Custom Search



Analyze image

Type of image

Clip Art Type	0 Non-clipart
Line Drawing Type	0 Non-Line Drawing
Black & White Image	False

Content of image

Categories	[{"name": "people_swimming", "score": 0.099609375}]
Adult Content	False
Adult Score	0.18533889949321747
Faces	[{"age": 27, "gender": "Male", "faceRectangle": {"left": 472, "top": 258, "width": 199, "height": 199}}]

Image colors

Dominant Color Background	White
Dominant Color Foreground	Grey
Dominant Colors	White
Accent Color	



OCR

Life is like riding
a bicycle

To keep your
balance you
must keep moving



Emotion API

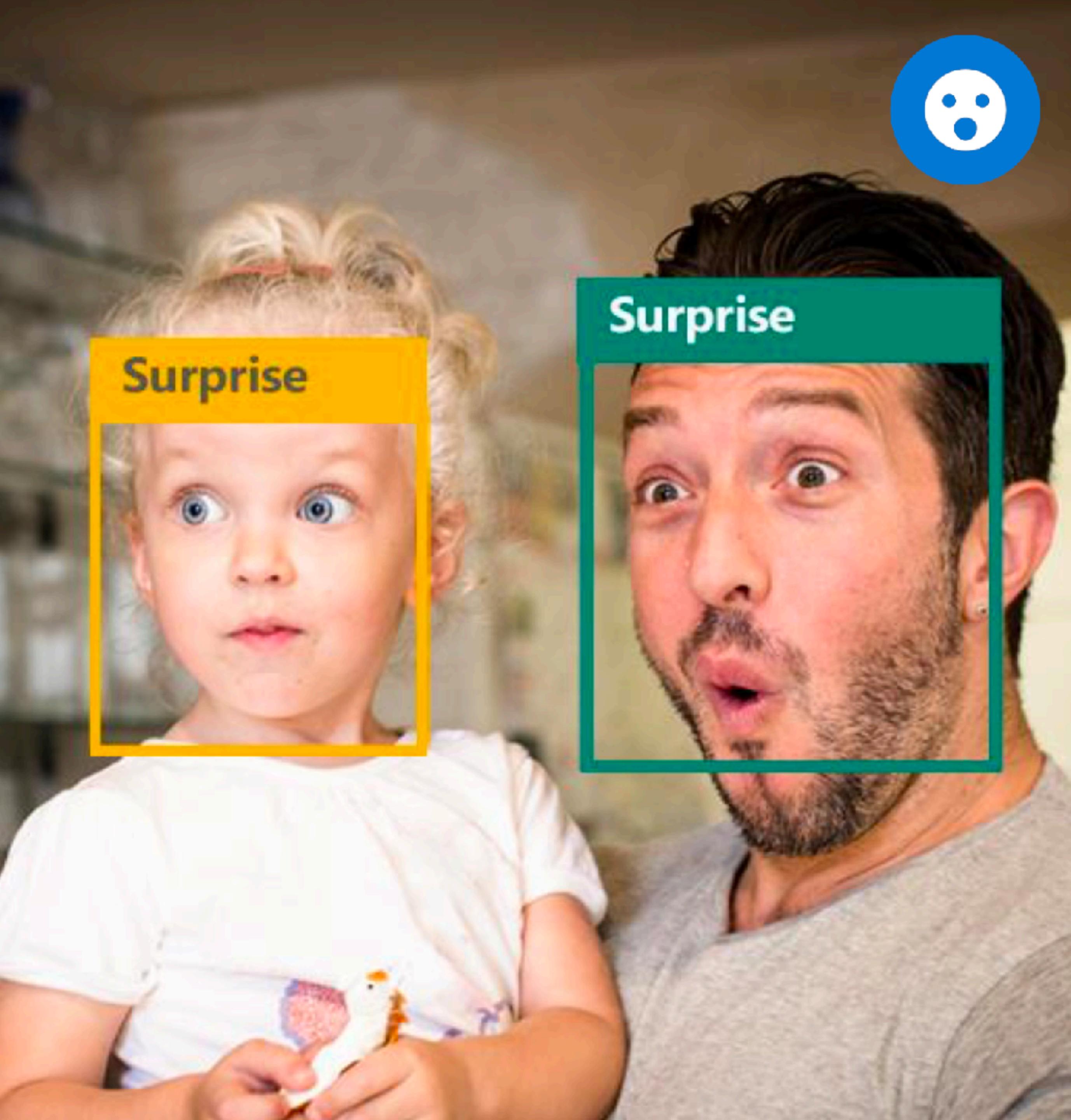


Face detection

```
"faceRectangle": {"width": 193,  
                 "height": 193,  
                 "left": 326,  
                 "top": 204} ...
```

Emotion scores

```
"scores": { "anger": 5.182241e-8,  
            "contempt": 0.0000242813,  
            "disgust": 5.621025e-7,  
            "fear": 0.00115027453,  
            "happiness": 1.06114619e-8,  
            "neutral": 0.003540177,  
            "sadness": 9.30888746e-7,  
            "surprise": 0.9952837}
```



Face API



Detection

```
"faceRectangle": {"width": 193, "height": 193,  
"left": 326, "top": 204}  
...  
...
```

Feature attributes

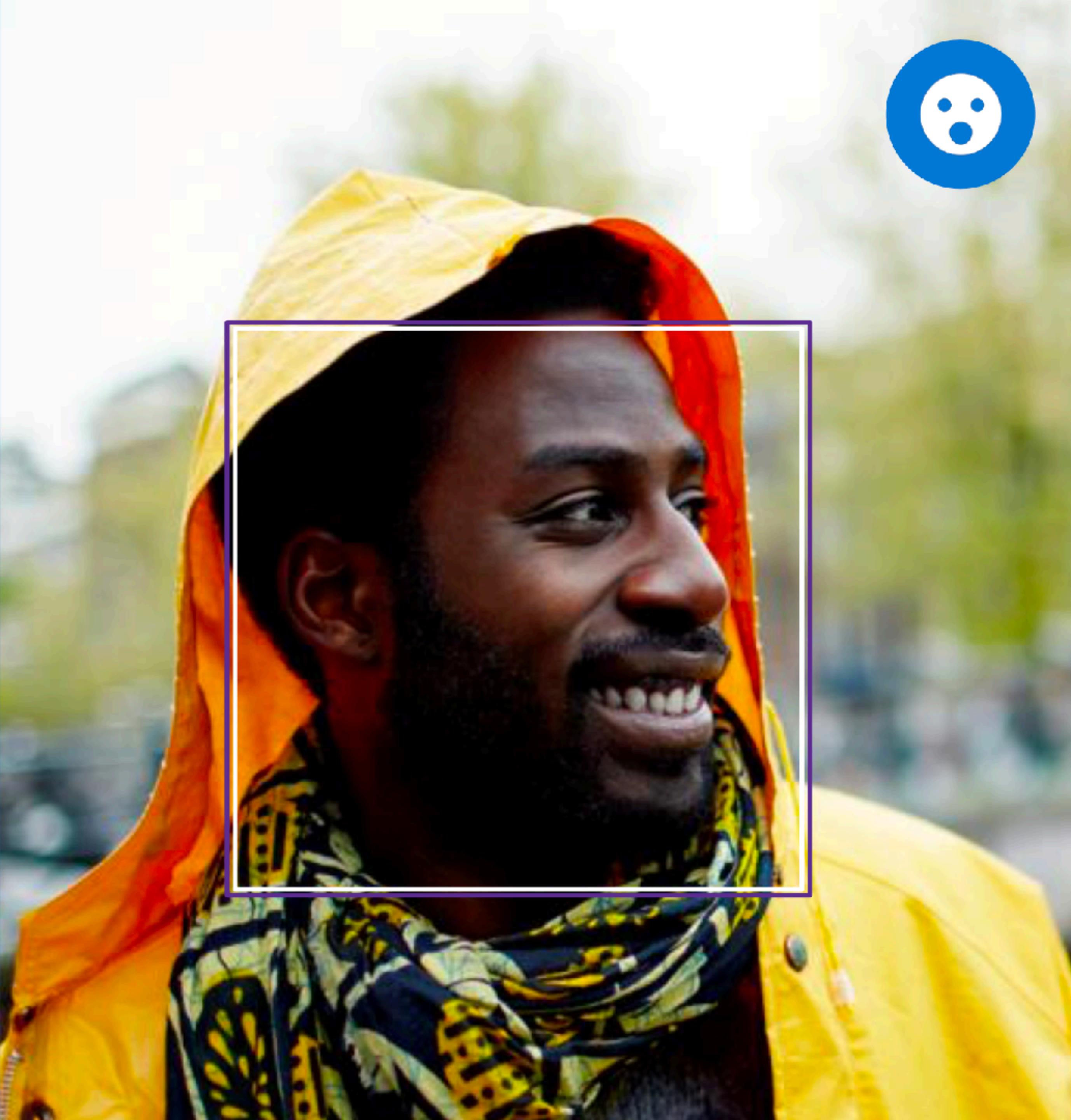
```
"attributes": { "age": 42, "gender": "male",  
"headPose": { "roll": "8.2", "yaw": "-37.8",  
"pitch": "0.0" }}
```

Grouping



Identification

Jasper Williams



Motion detection

Indicates when motion occurs against a fixed background (e.g., surveillance video)

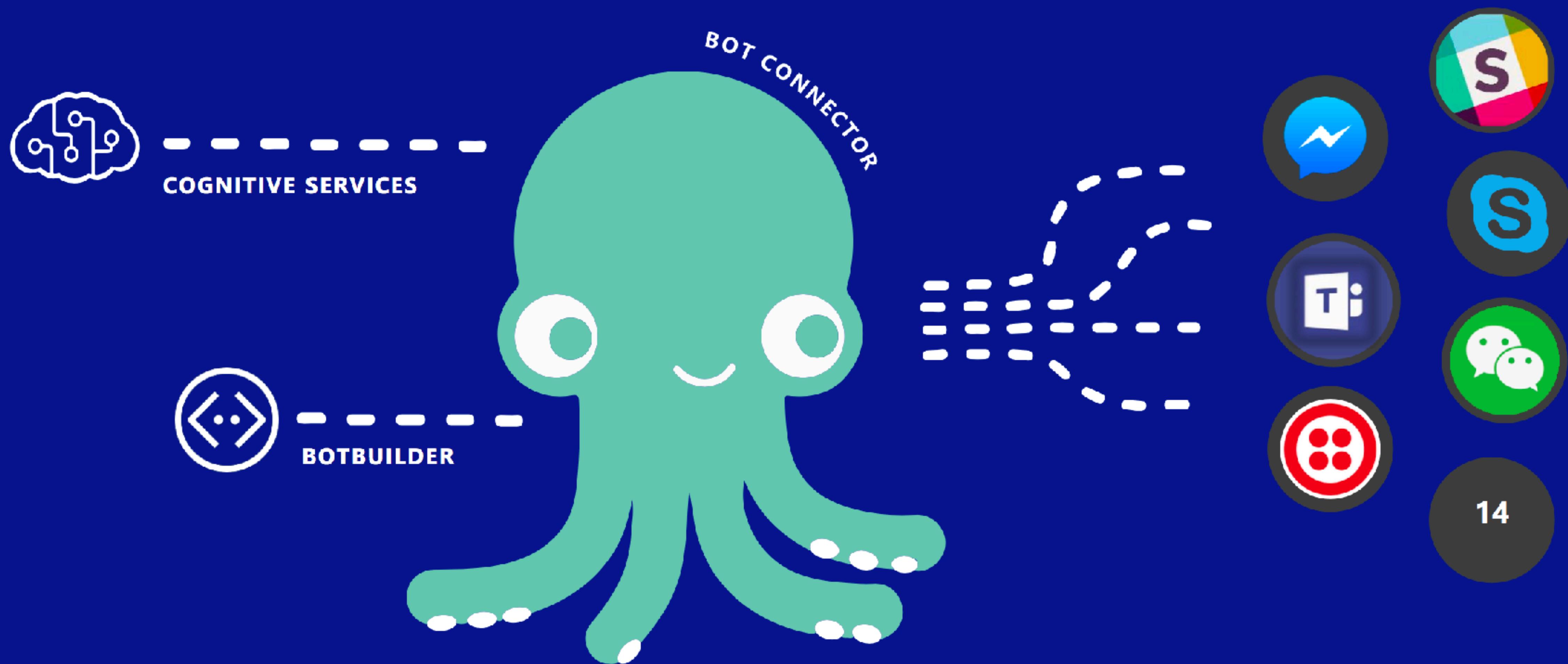
Trained to reduce false alarms, such as lighting and shadow changes



Start time	End time	In region
1.9	3.6	0
5.2	15.1	0

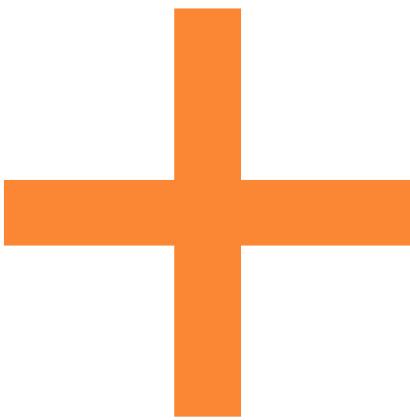
The Microsoft Bot Framework

Combined with Cognitive Services

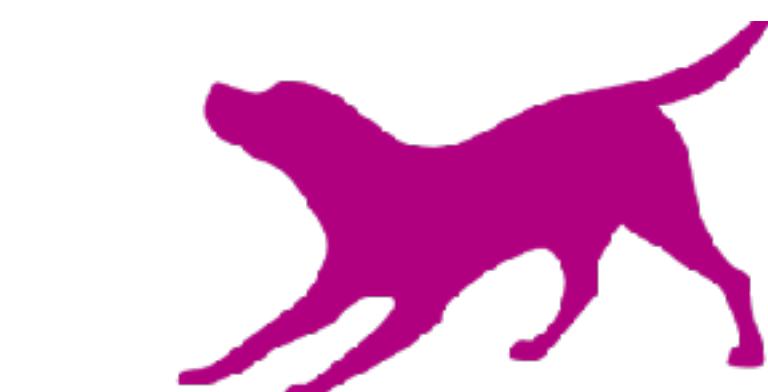
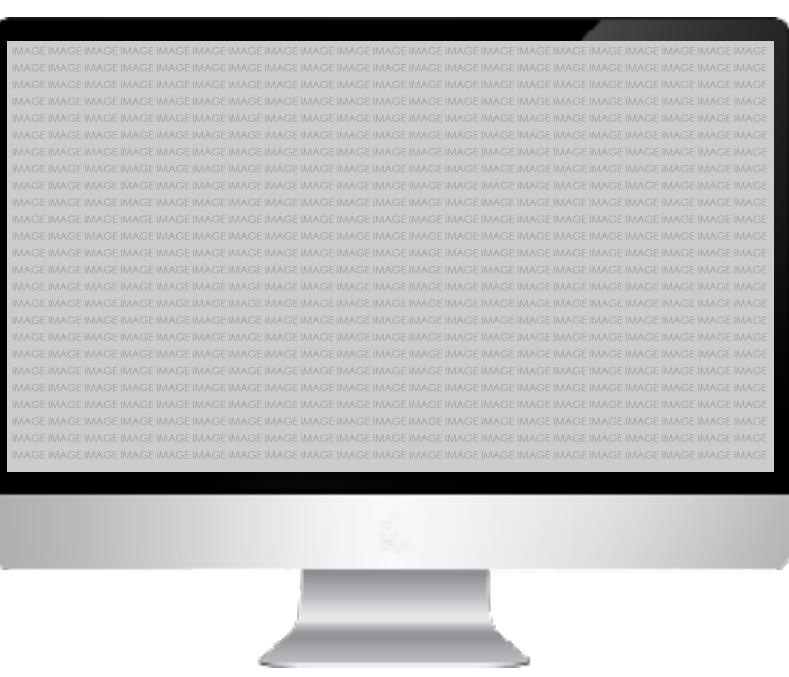
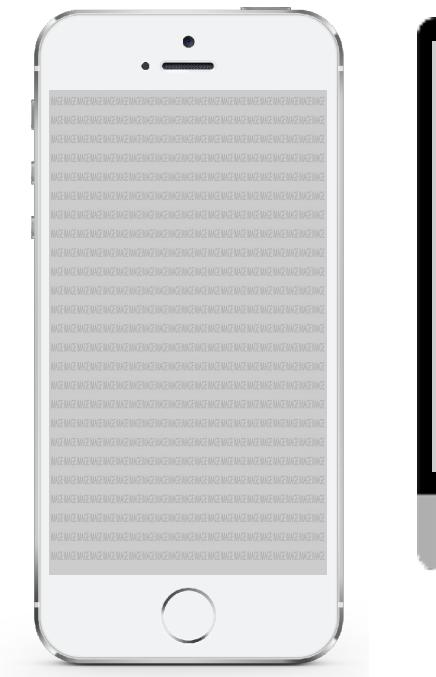


IDEAS For AI-BASED STARTUPS

A



B



Caffe2

The Caffe2 logo, which is a stylized coffee cup icon followed by the word "Caffe2".

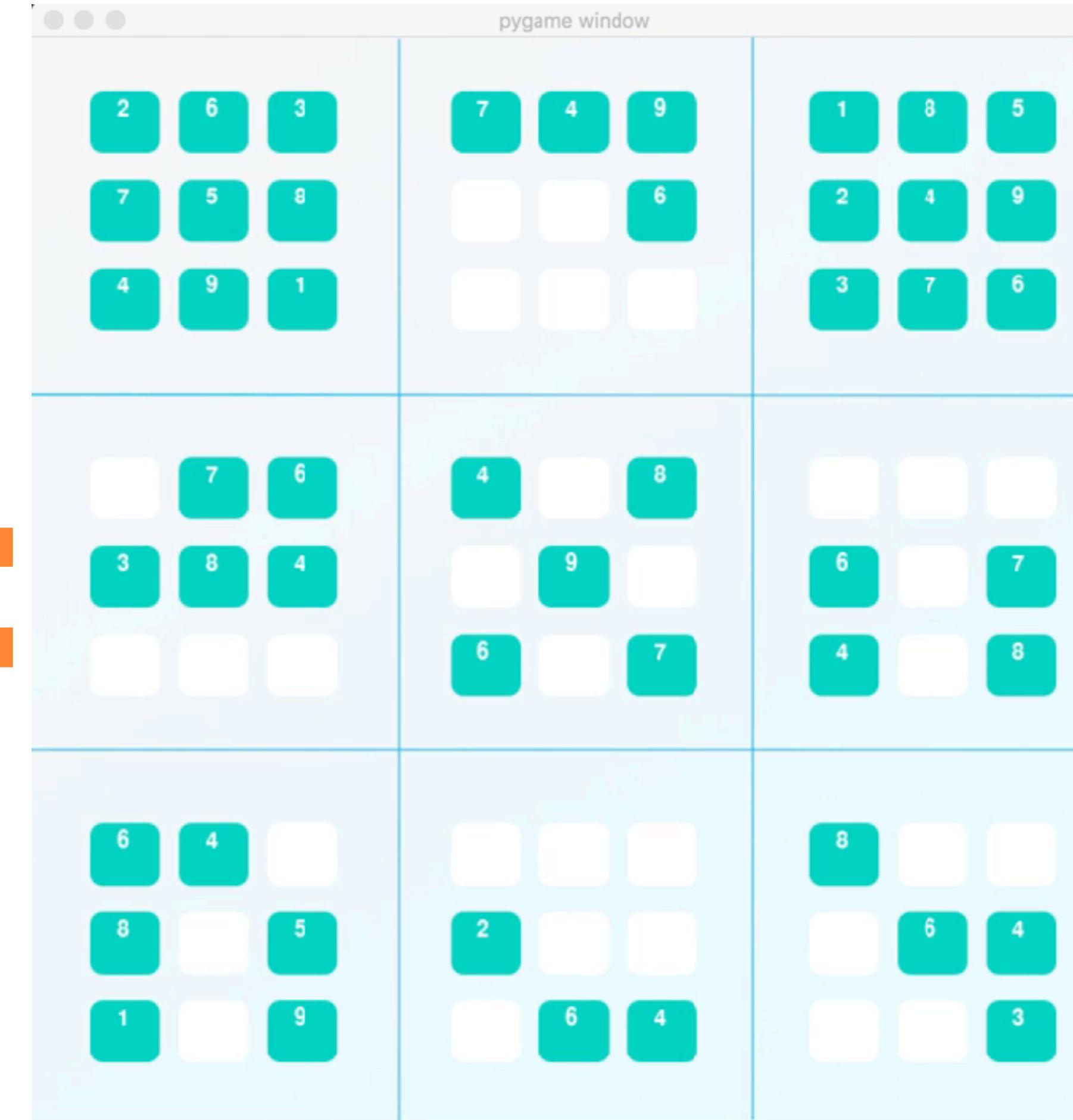
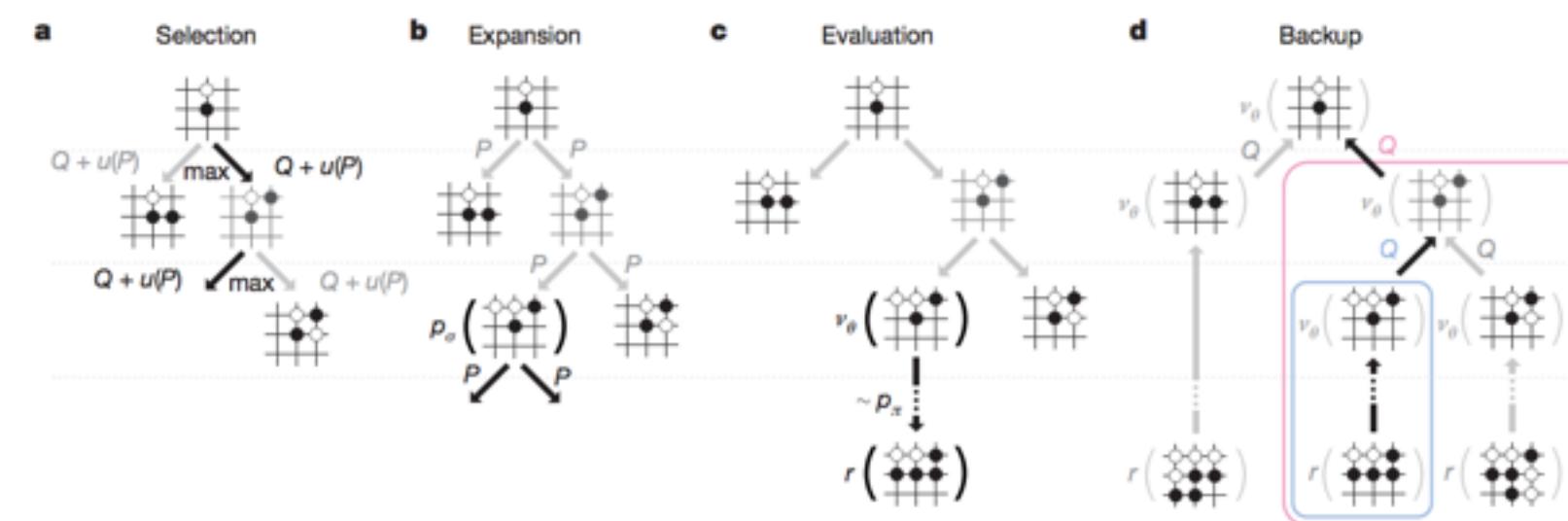
Jaw breaking App!!!



AI For Problem Solving



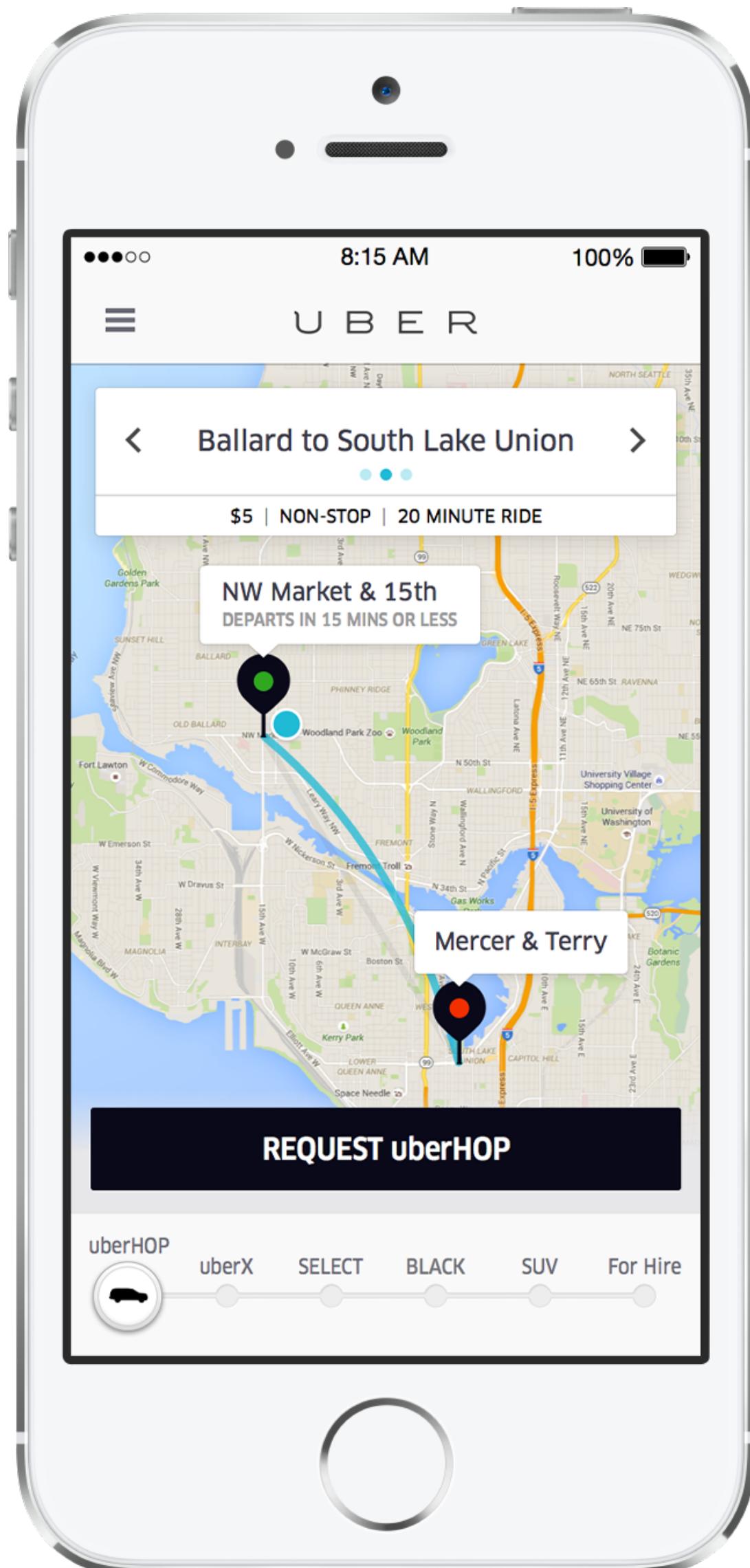
Elimination
Only-choice
Constraint propagation
Search*

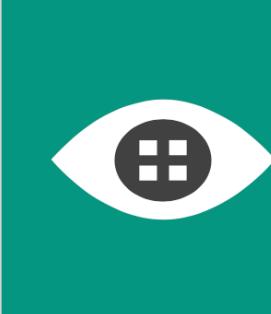


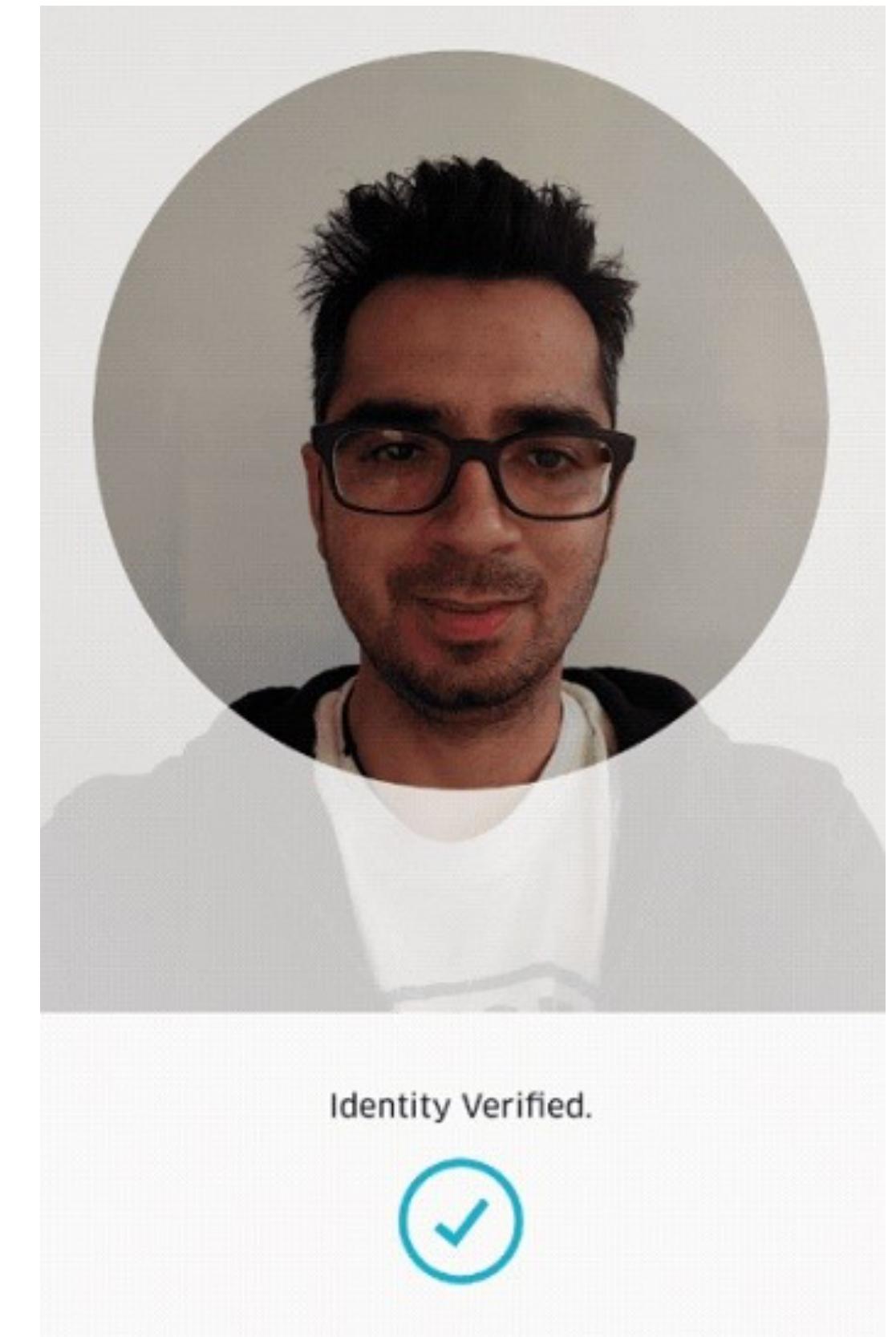
Source: <https://github.com/kwarodom/Sudoku-AI-Problem>

Tutorial: <http://bit.ly/2puUPND>

IDEA1: Uber uses face recognition to authenticate drivers



 Microsoft
Cognitive Services
 Face API.



<https://visual-recognition-demo.mybluemix.net>

<https://www.mobigyaan.com/uber-brings-selfie-powered-real-time-id-check-in-india>

IDEA2: Hayo uses computer vision to create unexpected smart home experiences



3D sensor

Respects your privacy – no video camera, microphone, or recording



Advanced motion analysis software

Stored in the cloud, updated in the background



Infrared technology

Works in low light conditions



Automatic repositioning

Remembers your environment even you move it



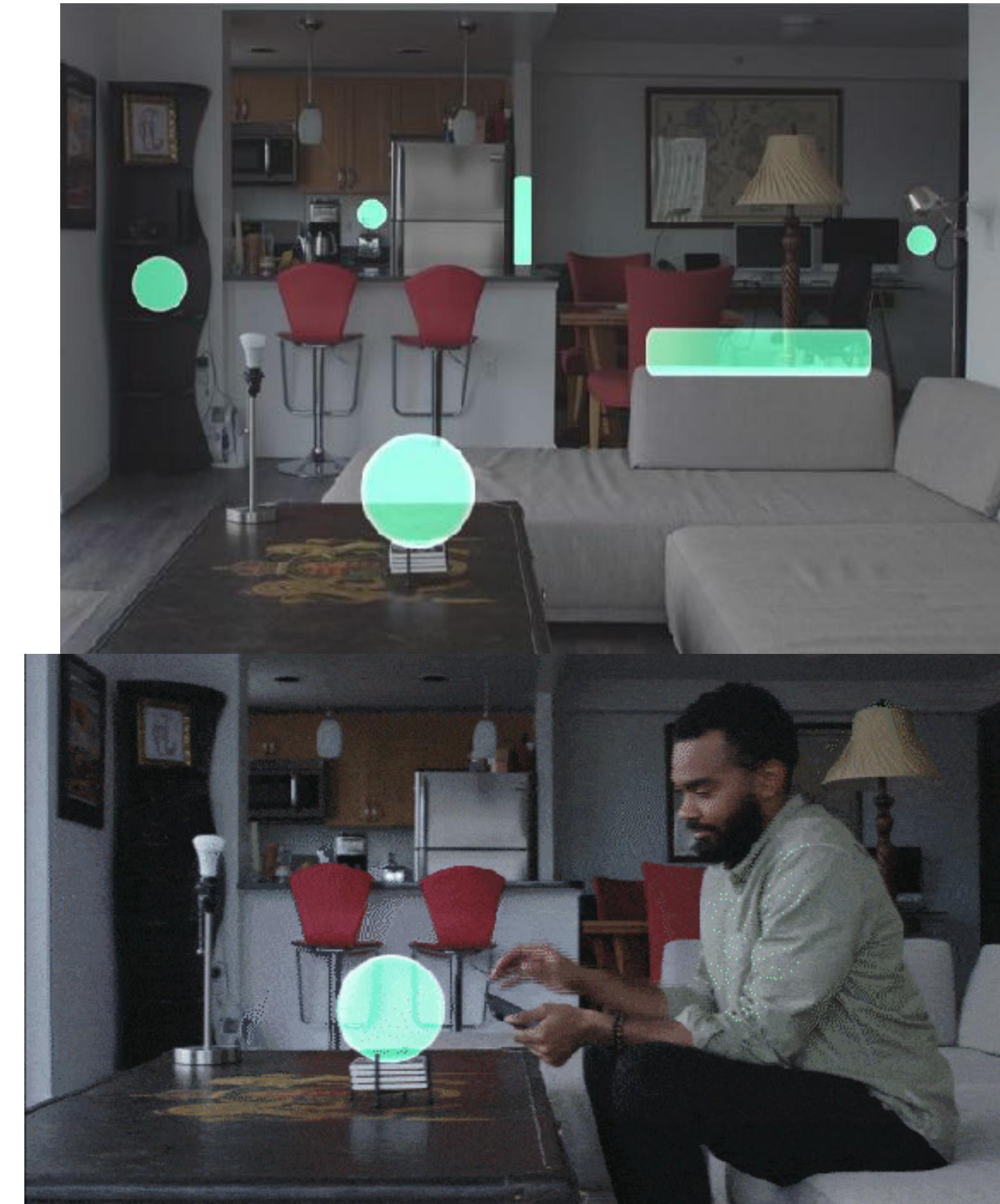
WiFi enabled

Pair easily with internet enabled devices on your WiFi network

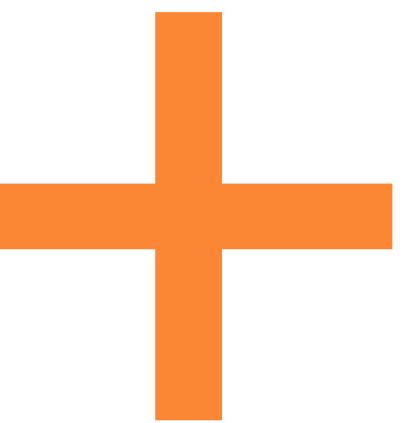
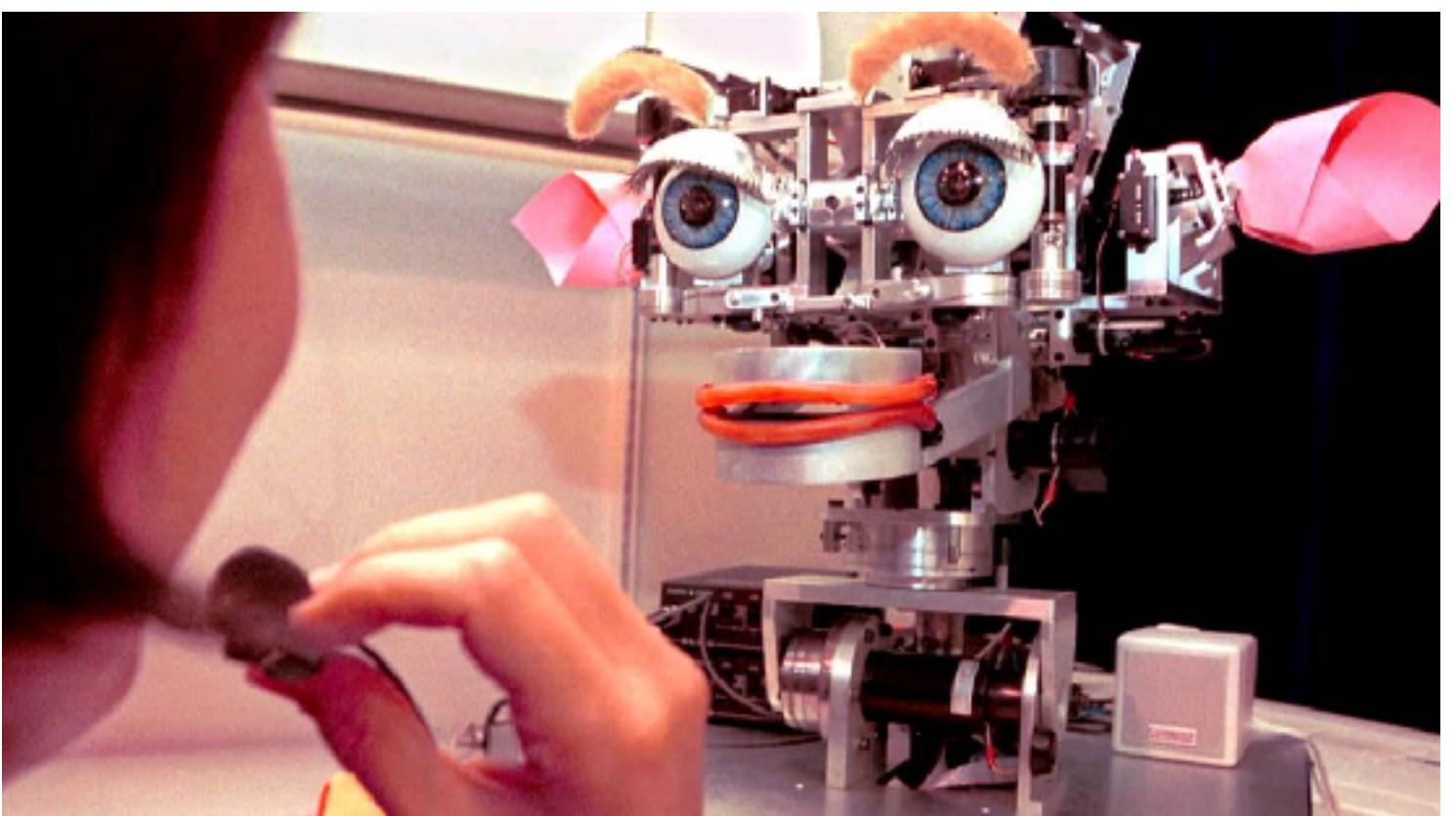


Home security system

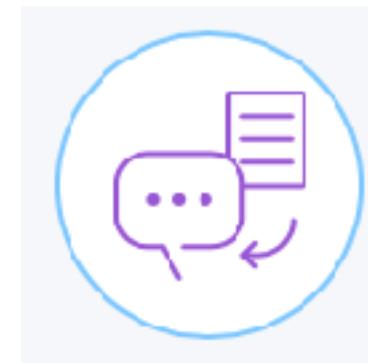
Use Hayo's sensor technology as an auxiliary home security system



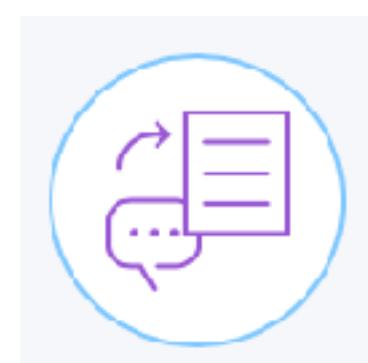
IDEA3: Jibo uses computer vision, speech to text, NLP, text to speech to create new robot experience



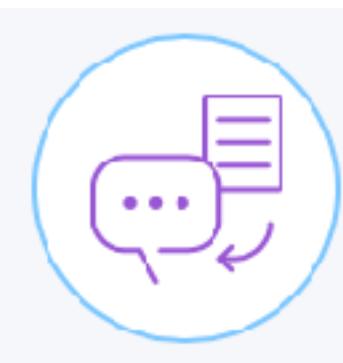
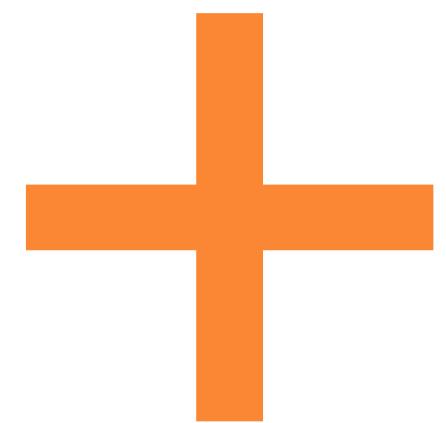
Text to Speech



Speech to Text



IDEA4: Alto speech to text, Thai NLP, and text to speech to create a personal assistant speaker for seniors



Text to Speech



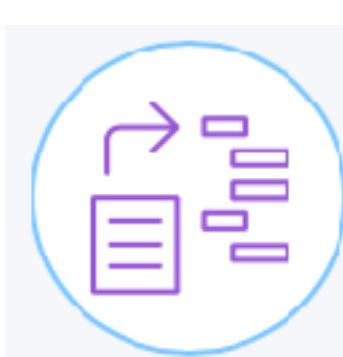
Speech to Text



IoT Platform



Visual Recognition



Natural Language Understanding



Talk to Alto
e.g. "help!"



Alto sends notification
to son and call ambulance

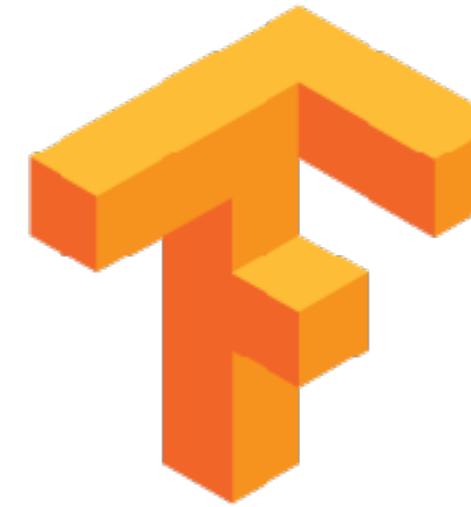


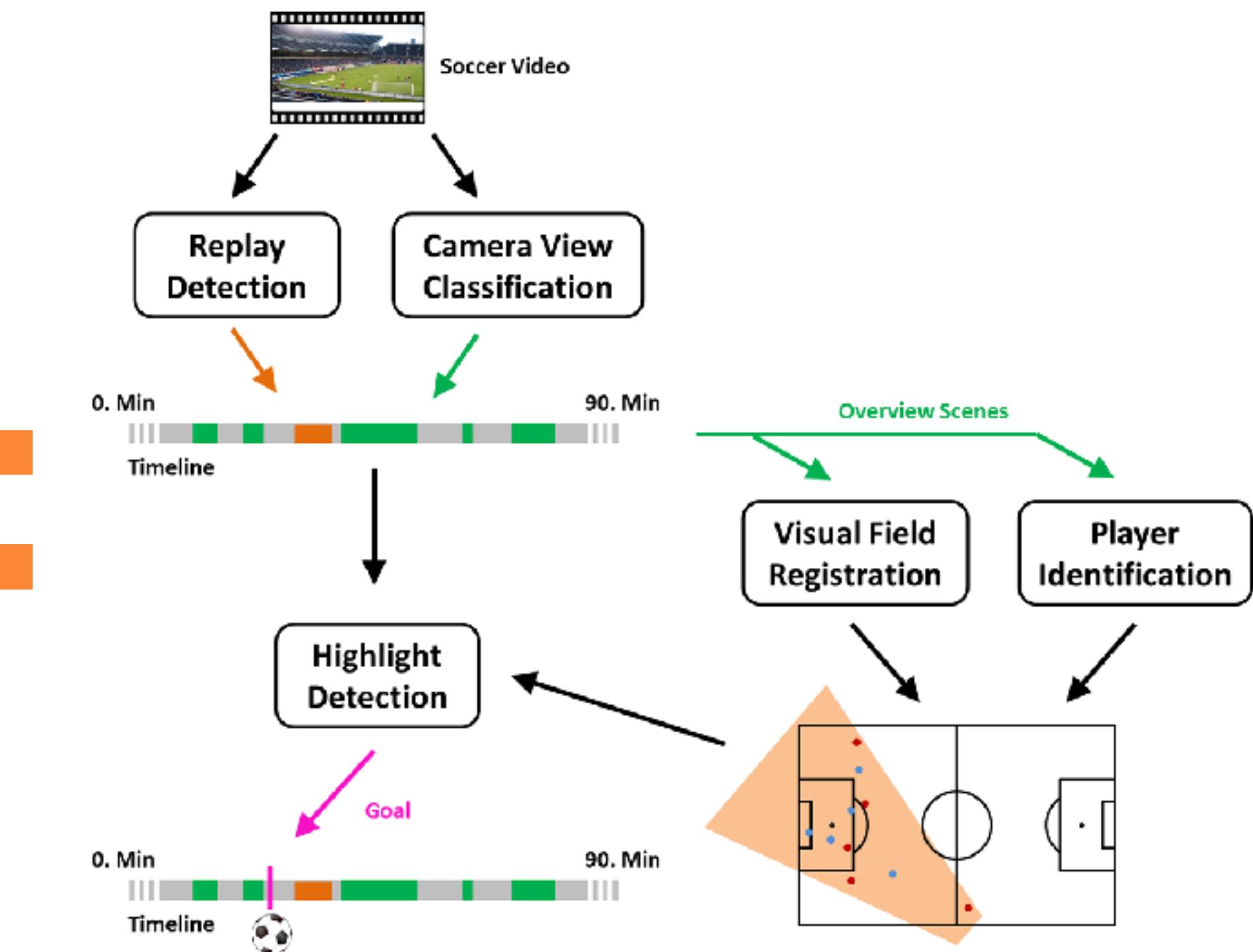
Ambulance
comes to rescue



IDEA5: Video Content Recognition



+  

IDEA6: Amazon, Spotify, and Instagram use RecommenderSystem

Branch: master → mlrecommender / collaborative filtering / movie_ratings_data_set.csv

Find file Copy path

529797c 8 minutes ago

1 contributor

Executable File | 681 lines (681 sloc) | 5.83 KB

Raw Blame History

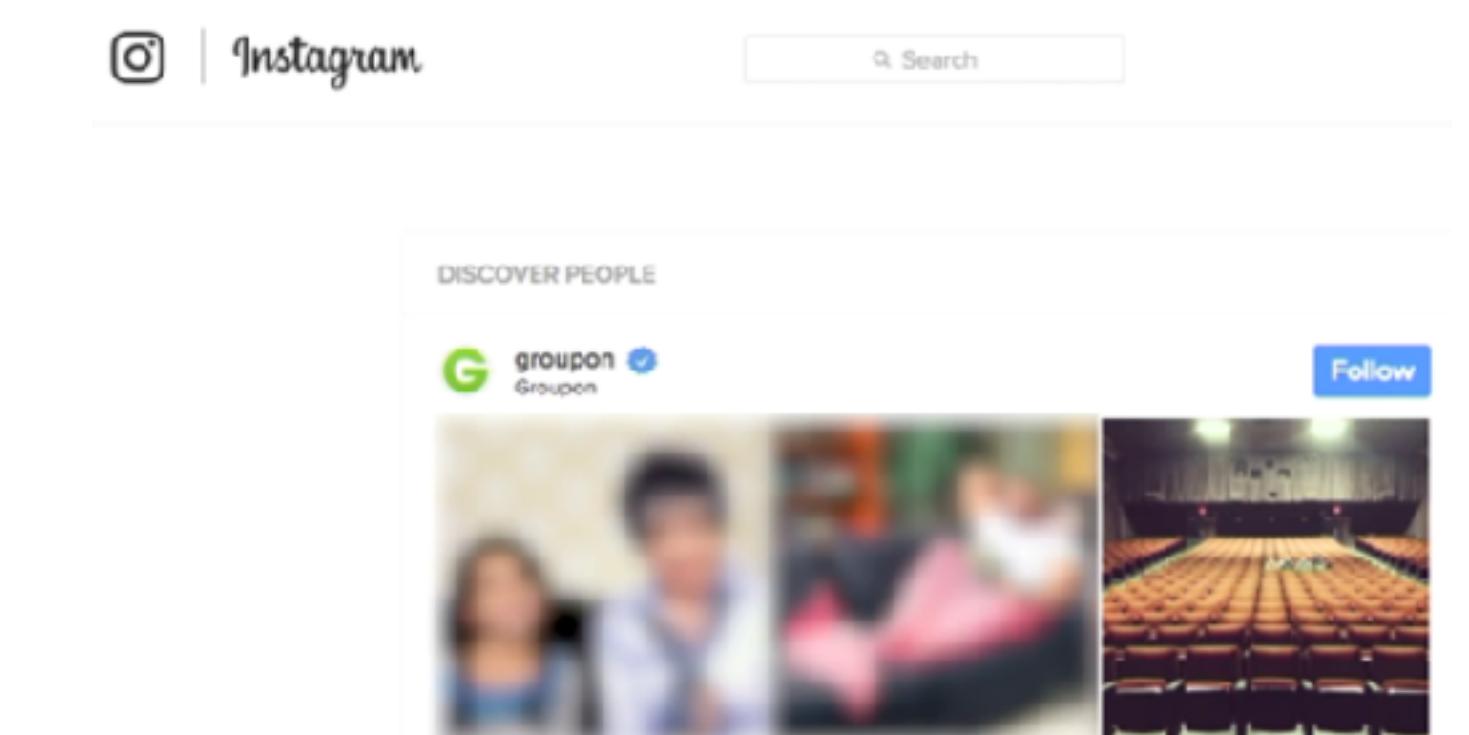
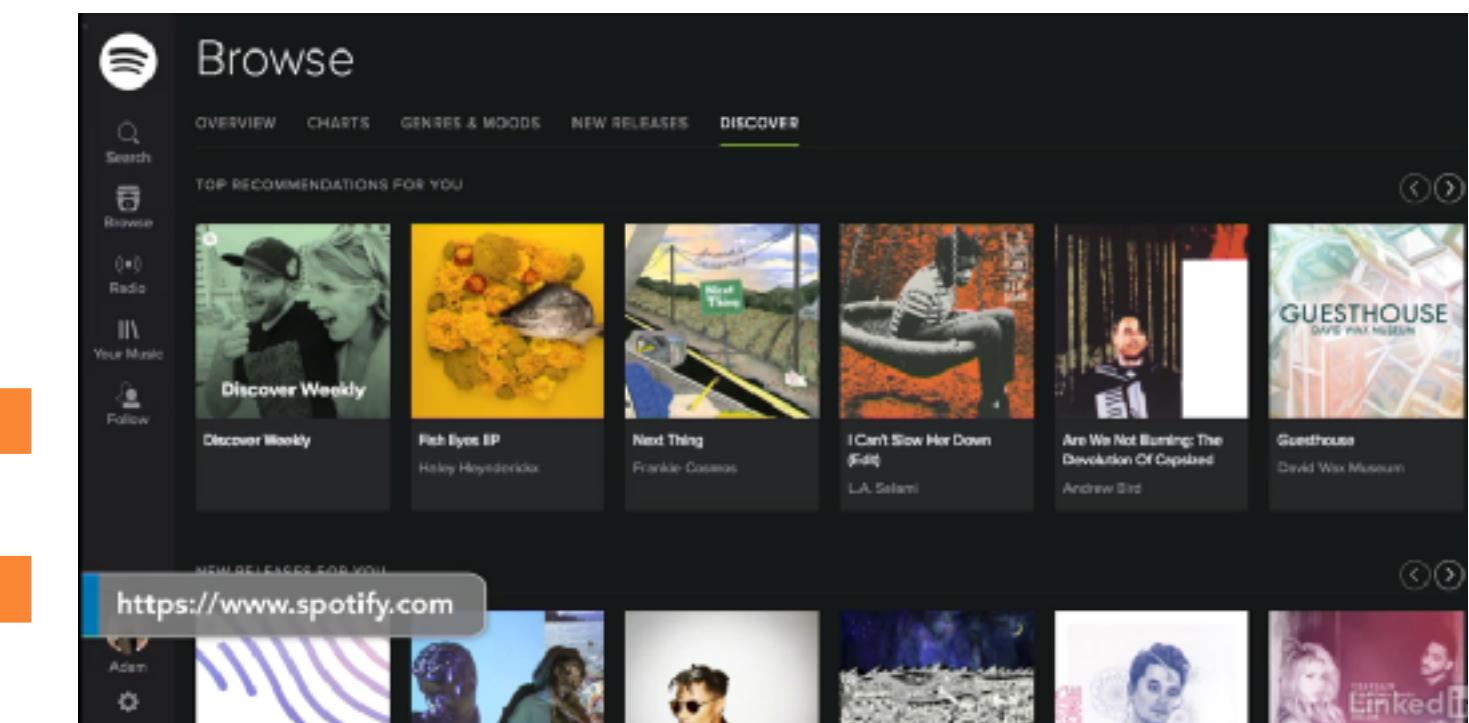
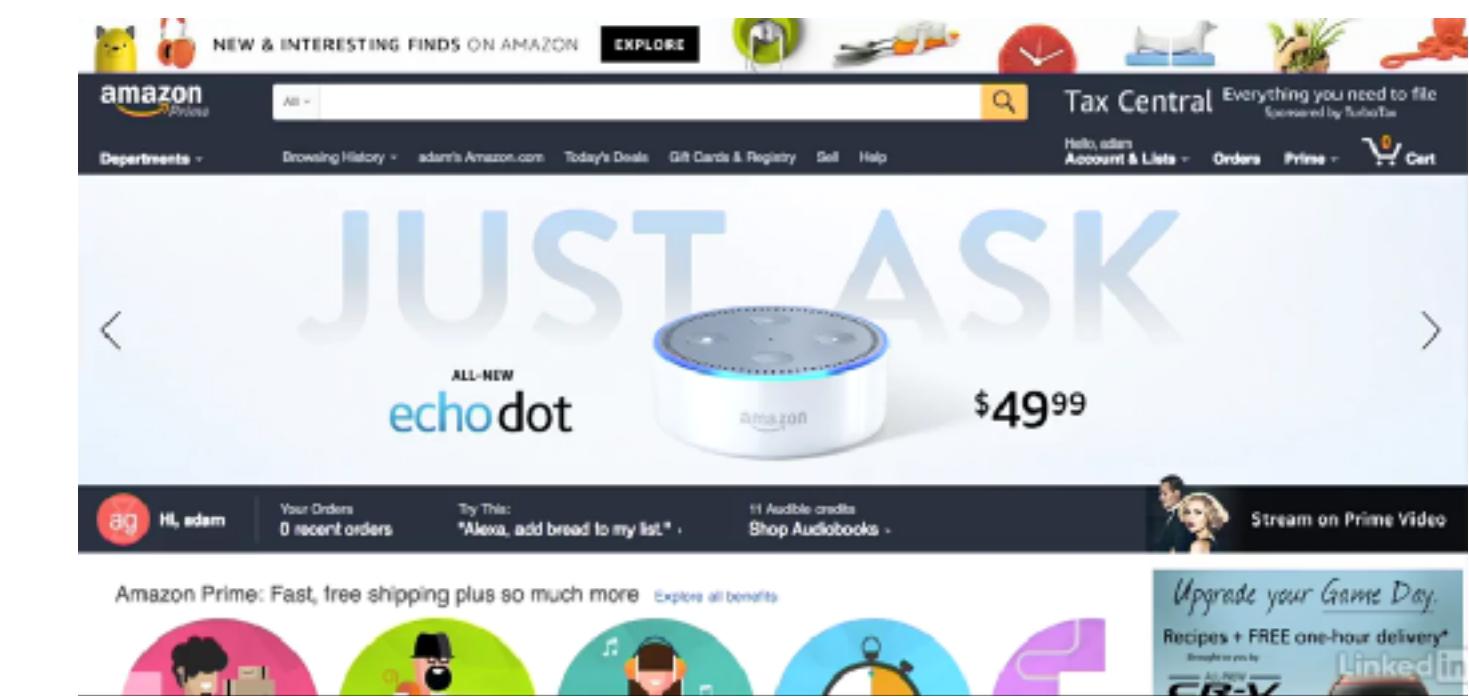
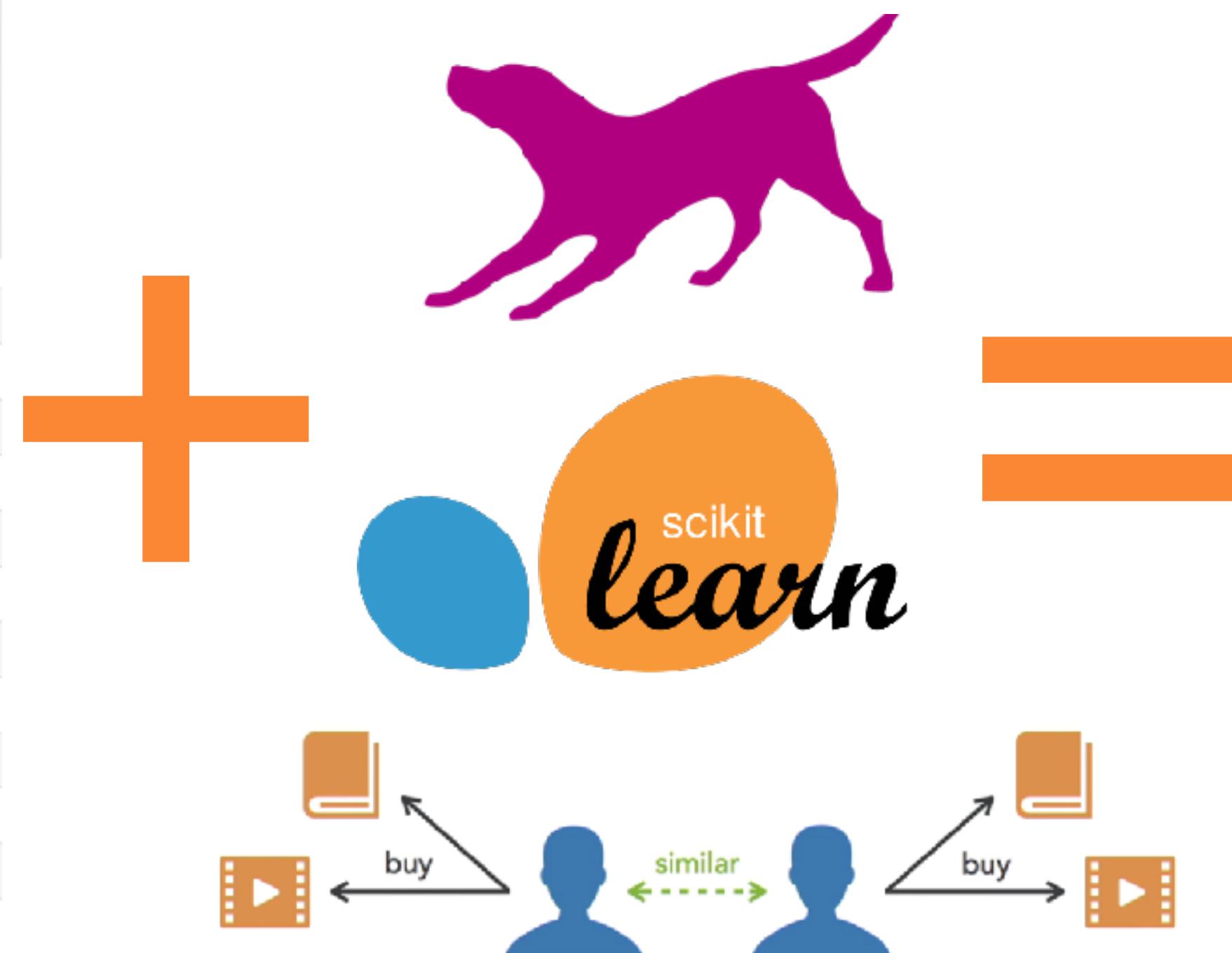
Search this file...

user_id	movie_id	value
1	28	4
1	28	4
1	9	4
1	1	4
1	14	4

movie_id	title	genre
1	The Sheriff 1	crime drama, western
2	The Big City Judge 1	legal drama
3	The Sheriff 2	crime drama, western
4	Just a Regular Family	reality
5	The Big City Judge 2	legal drama
6	Attack on Earth 1	sci-fi, action
7	The Secret Box	sci-fi, mystery, fantasy
8	Sci-Fi Murder Detectives	supernatural, mystery
9	Biker Gangs	crime drama, action
10	Surrounded by Zombies 1	horror, zombie fiction

Collaborative Filtering

Content-based



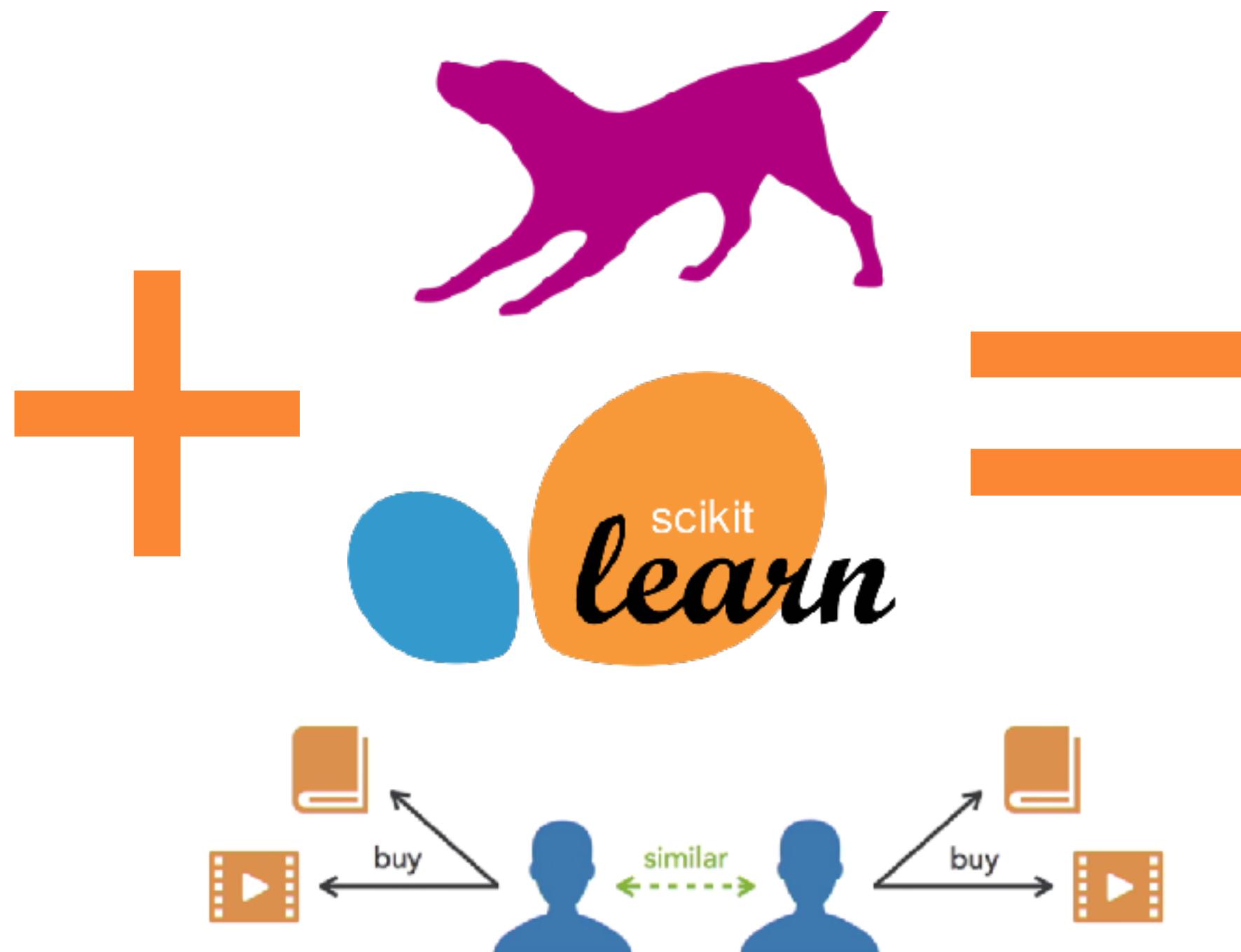
Source: <https://github.com/kwarodom/mlrecommender>

https://github.com/kwarodom/winerec_tutorial

IDEA7: Recommendations System for Food Delivery

Collaborative Filtering

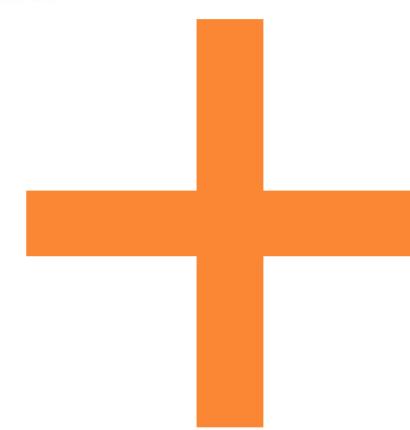
Content-based



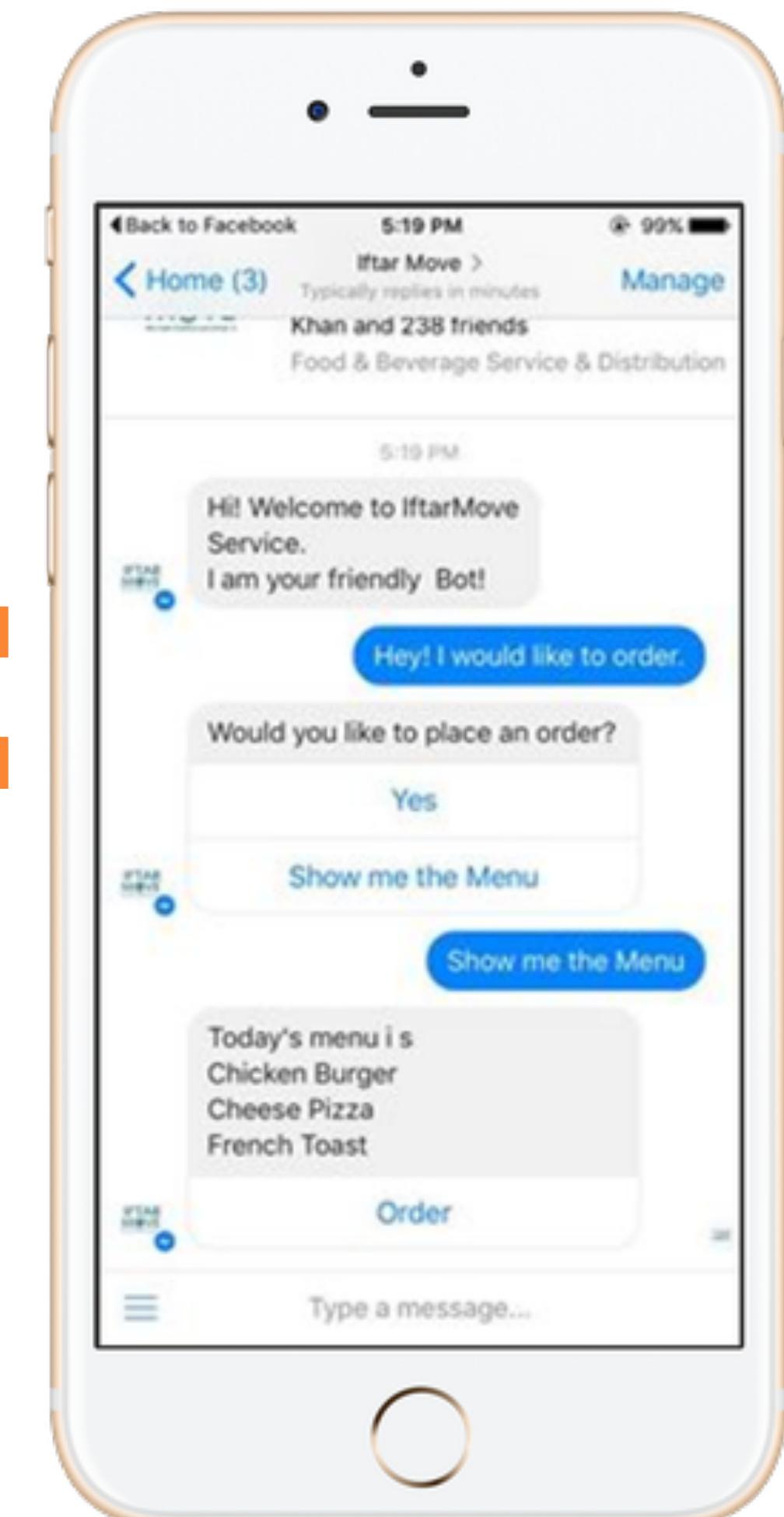
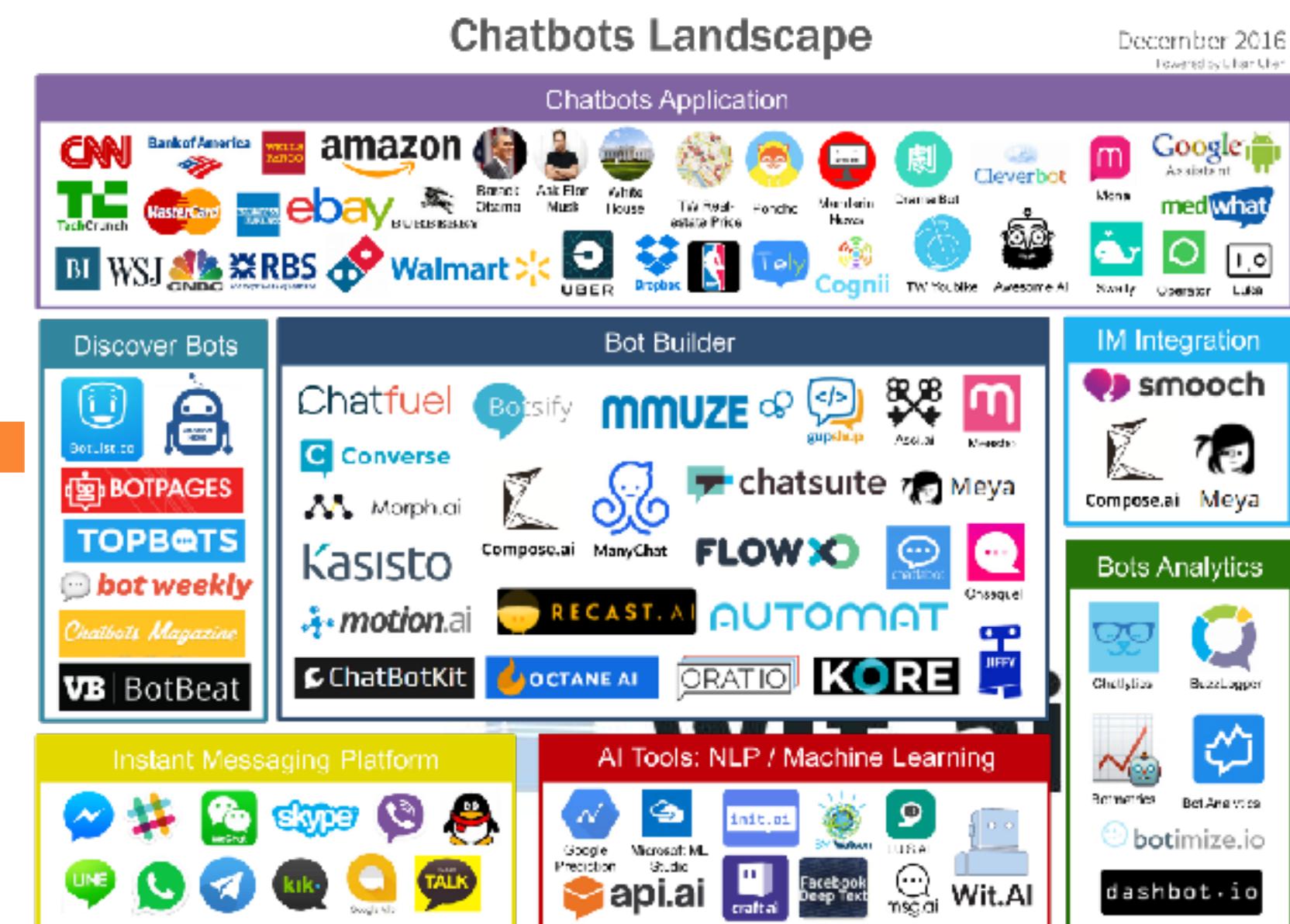
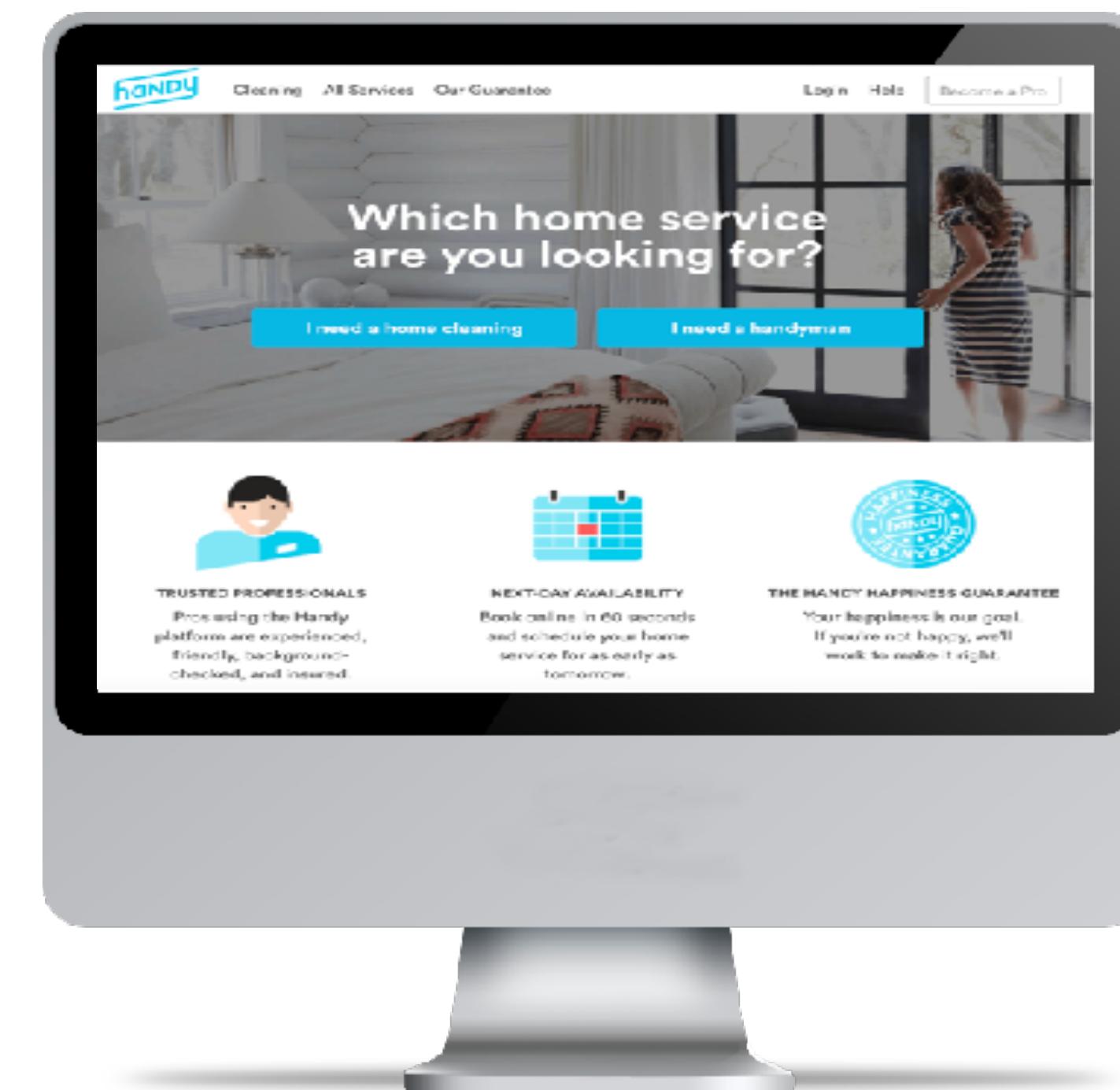
Source: <https://github.com/kwarodom/mlrecommendations>

https://github.com/kwarodom/winerec_tutorial

IDEA8: Self-Driving Cars



IDEA 9: Chatbot for customer support

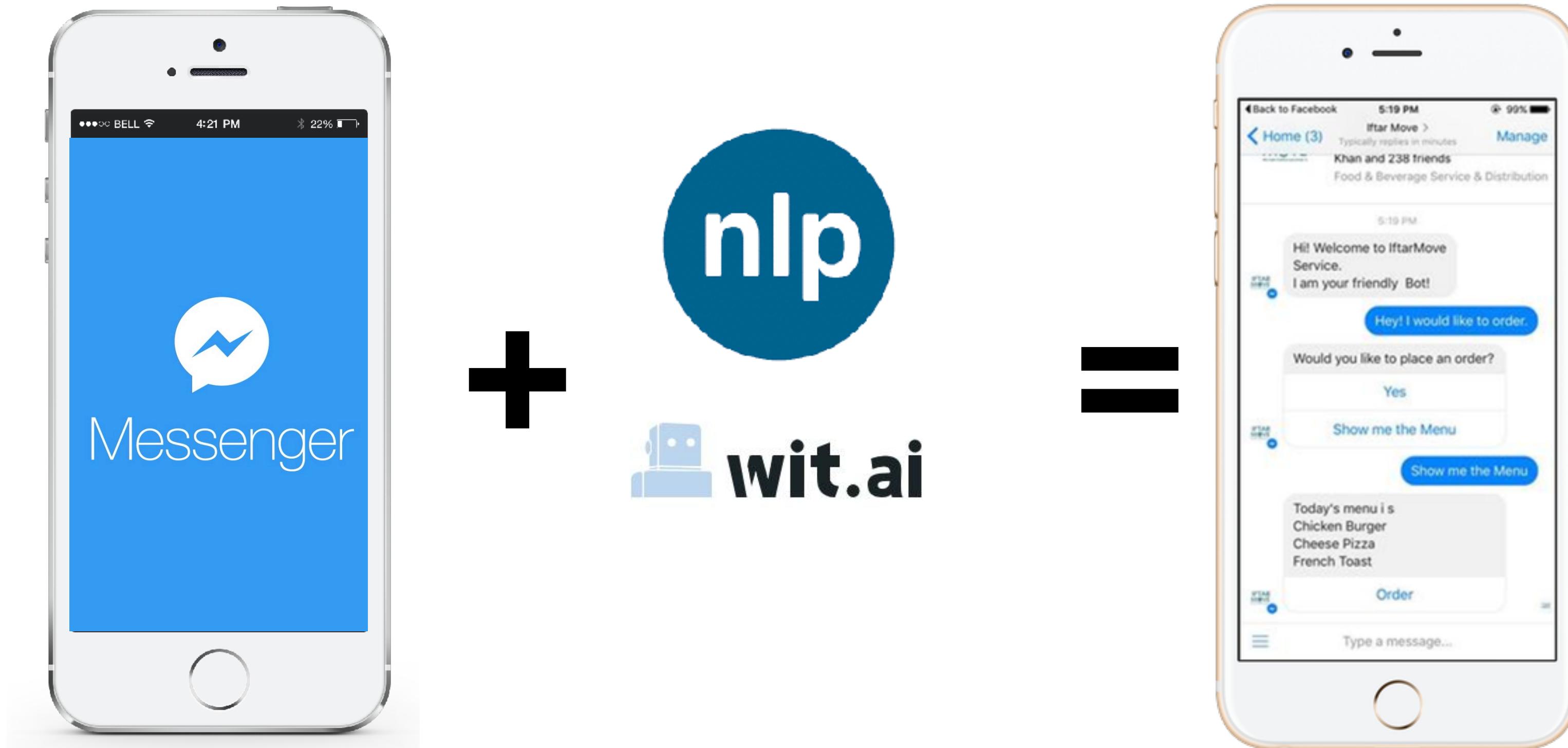


https://github.com/kwarodom/tensorflow_chatbot

Amazon, Facebook and Apple are digging deeper into chatbots

NLP : Facebook Chat Bot

- Chatting with bot for ask information, Order Stuff.



facebook Messenger Platform : <https://developers.facebook.com/docs/messenger-platform>

Wit.ai (NLP for Developer) : <https://wit.ai>

Chatbots Landscape

December 2016

Powered by Lihsin Chen

Chatbots Application

Discover Bots

Bot Builder

IM Integration

Bots Analytics

Instant Messaging Platform

AI Tools: NLP / Machine Learning

https://github.com/kwarodom/tensorflow_chatbot

SO, WHAT IF I WANT TO LEARN HOW TO BUILD DATA PRODUCT?

Code4Startup

One Month



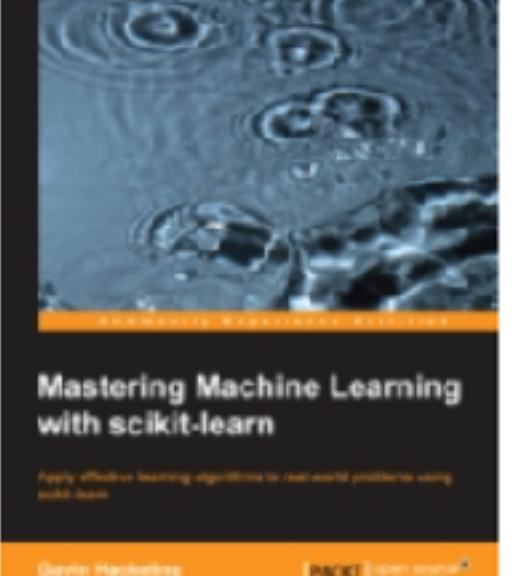
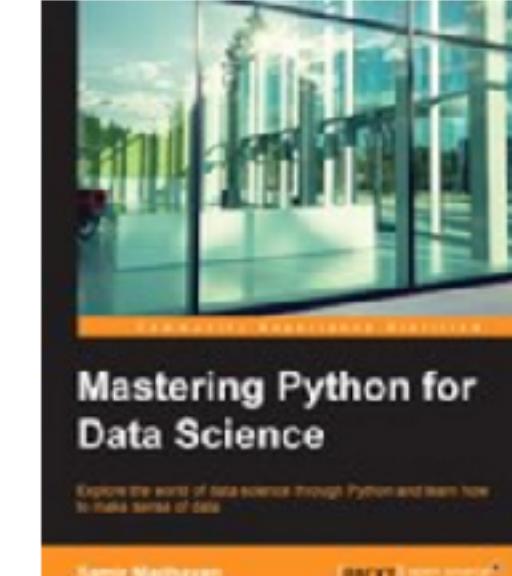
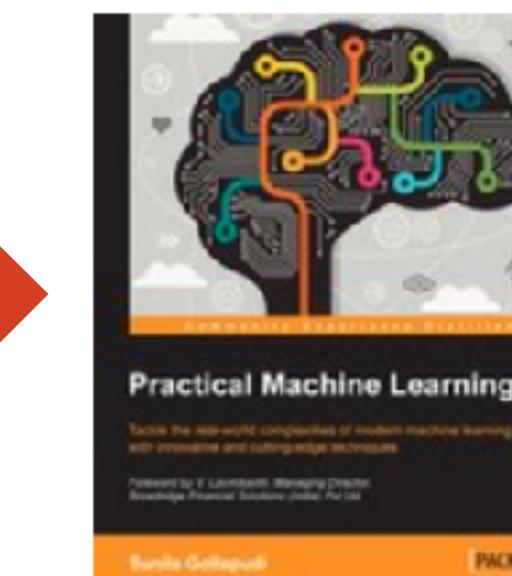
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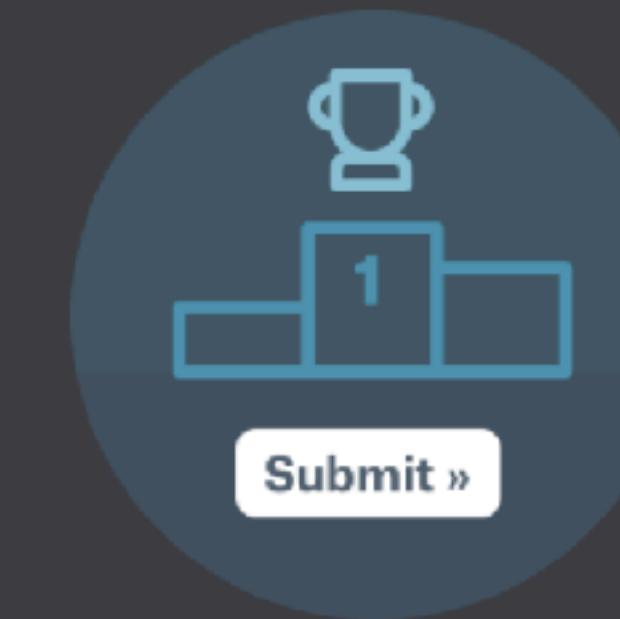
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Get started with a tutorial on our most popular competition for beginners, [Titanic: Machine Learning from Disaster](#).



Build a Model

Get the data & use whatever tools or methods you prefer to make predictions.



Make a Submission

Upload your prediction file for real-time scoring & a spot on the leaderboard.