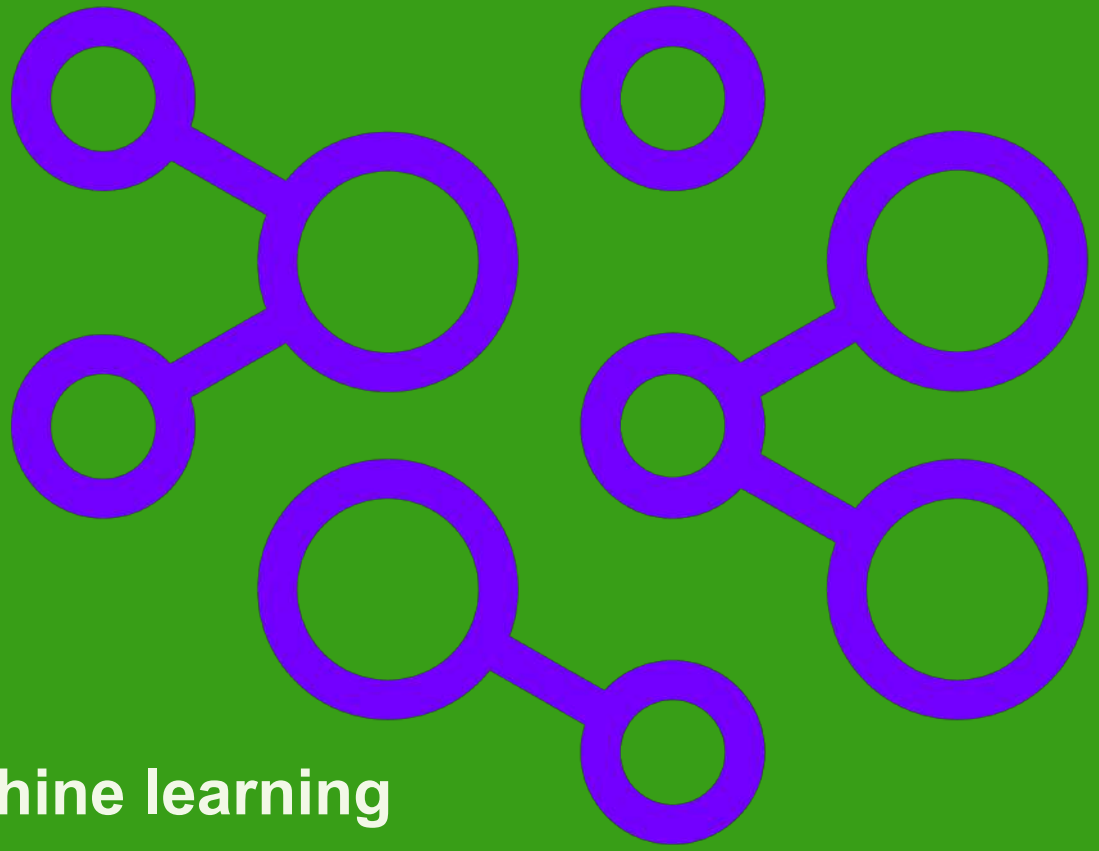
Solve for X with AI:



a VC view of the machine learning & AI landscape

Ed Fernandez @efernandez

Mentor, Advisor at ***Singularity University*** & ***Berkeley's*** **Center for Entrepreneurship & Technology**

Early Stage & Start-Up VC at **Naiss.io -** VC boutique/Palo Alto

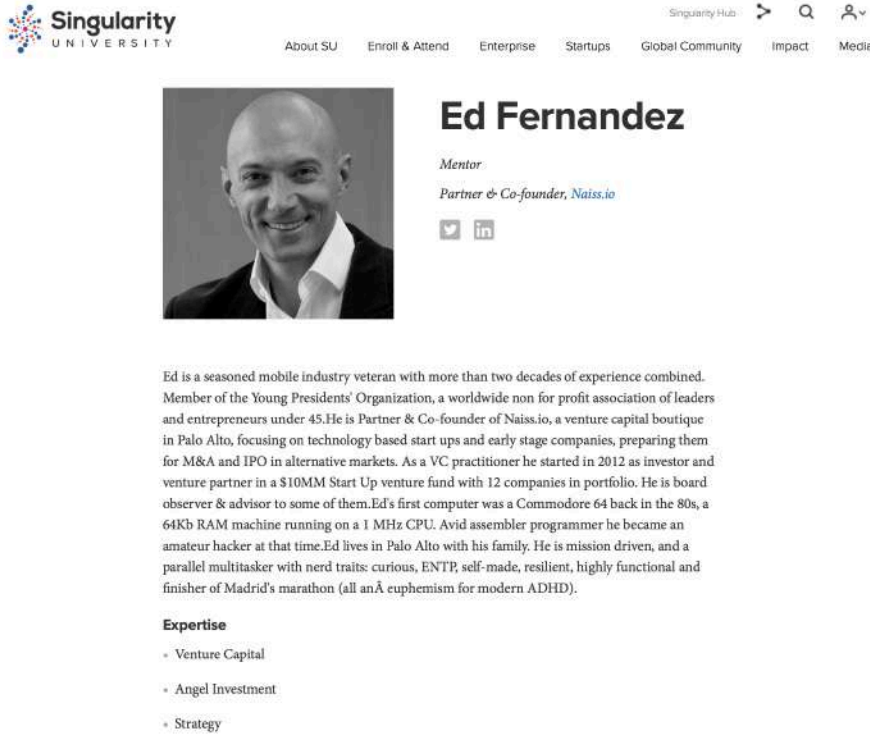
Investor/board director @ **BigML** inc (*MLaaS: Machine Learning as a Service*)

Former corporate **EVP** at *BlackBerry & Nokia*

@efernandez

ed@naiss.io

+15614104388



Singularity UNIVERSITY

Singularity Hub | About SU | Enroll & Attend | Enterprise | Startups | Global Community | Impact | Media

Ed Fernandez

Mentor

Partner & Co-founder, Naiss.io

Ed is a seasoned mobile industry veteran with more than two decades of experience combined. Member of the Young Presidents' Organization, a worldwide non for profit association of leaders and entrepreneurs under 45.He is Partner & Co-founder of Naiss.io, a venture capital boutique in Palo Alto, focusing on technology based start ups and early stage companies, preparing them for M&A and IPO in alternative markets. As a VC practitioner he started in 2012 as investor and venture partner in a $10MM Start Up venture fund with 12 companies in portfolio. He is board observer & advisor to some of them.Ed's first computer was a Commodore 64 back in the 80s, a 64Kb RAM machine running on a 1 MHz CPU. Avid assembler programmer he became an amateur hacker at that time.Ed lives in Palo Alto with his family. He is mission driven, and a parallel multitasker with nerd traits: curious, ENTP, self-made, resilient, highly functional and finisher of Madrid's marathon (all anÃ euphemism for modern ADHD).

Expertise

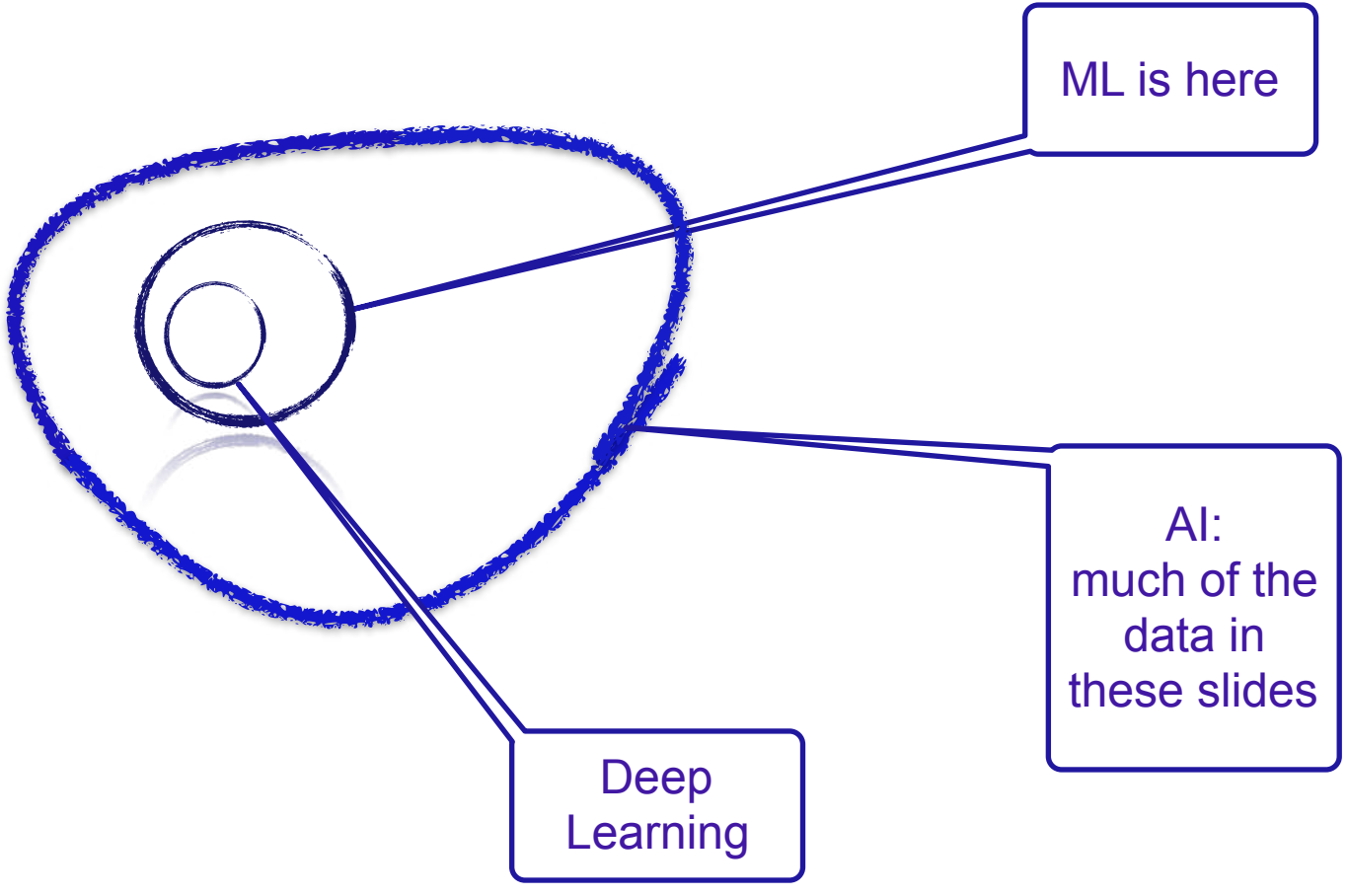
- Venture Capital
- Angel Investment
- Strategy

What you'll get from this deck

1. **The M&A race for AI**: by the numbers
2. **Watch out! hype ahead**
3. **Machine Learning drivers**: why is Machine Learning a 'thing' now (vs before)
4. **Venture Capital**: forming an industry, the AI/ML landscape
5. **The One Hundred (+13) AI startups to watch in the Enterprise**
6. **The great Enterprise pivot**: applying Machine Learning at scale
7. - *where to go next* -

Definitions & Disclaimer

Machine Learning is NOT Deep Learning NOR AI or AGI

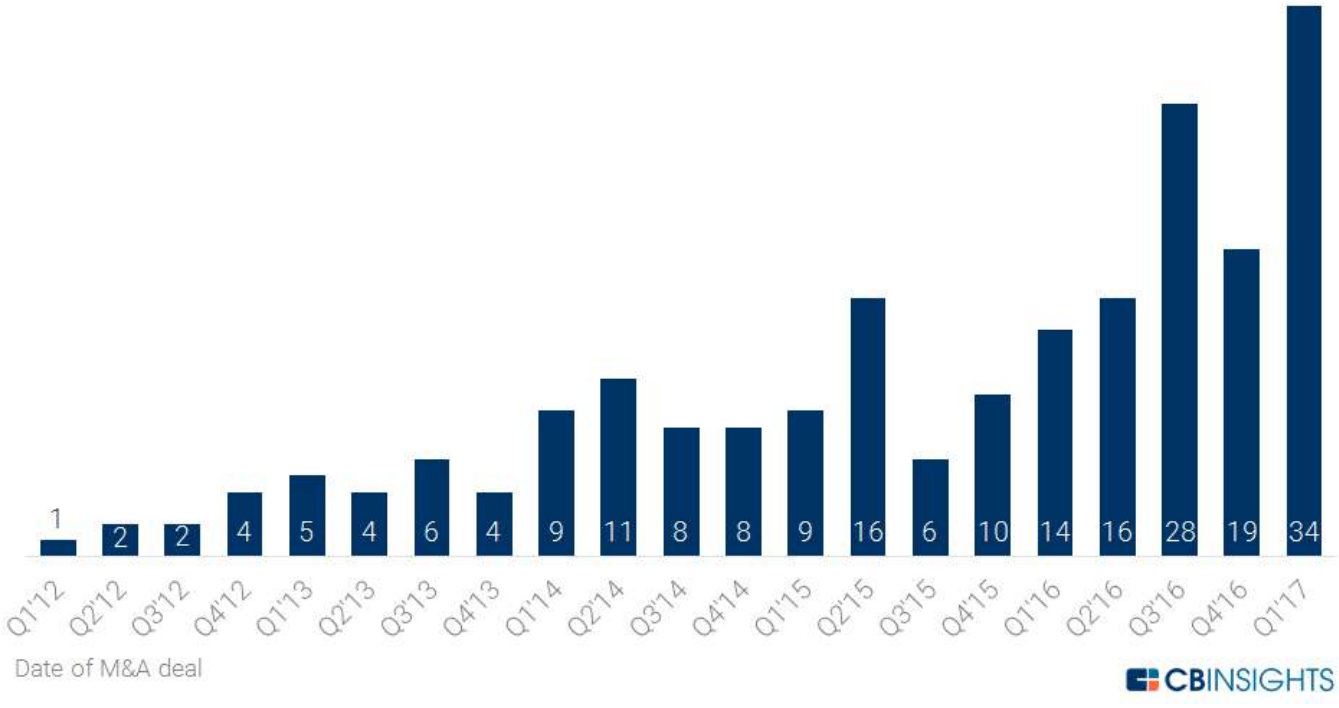


The M&A race for AI

By number of deals, quarterly

200+
Acquisitions since 2012

30+
M&A deals in Q1'17



The M&A race for AI

latest update

September 8th Update - **CBinsights** :

There were **85 disclosed M&A deals** targeting AI startups in 2017 year-to-date.

This is more than the **75 we saw in 2016**.

Includes Facebook's acquisition of Ozlo and Nasdaq acquisition of eVestment ($705M).

John Deere acquired agricultural tech company Blue River Technology for $305M.

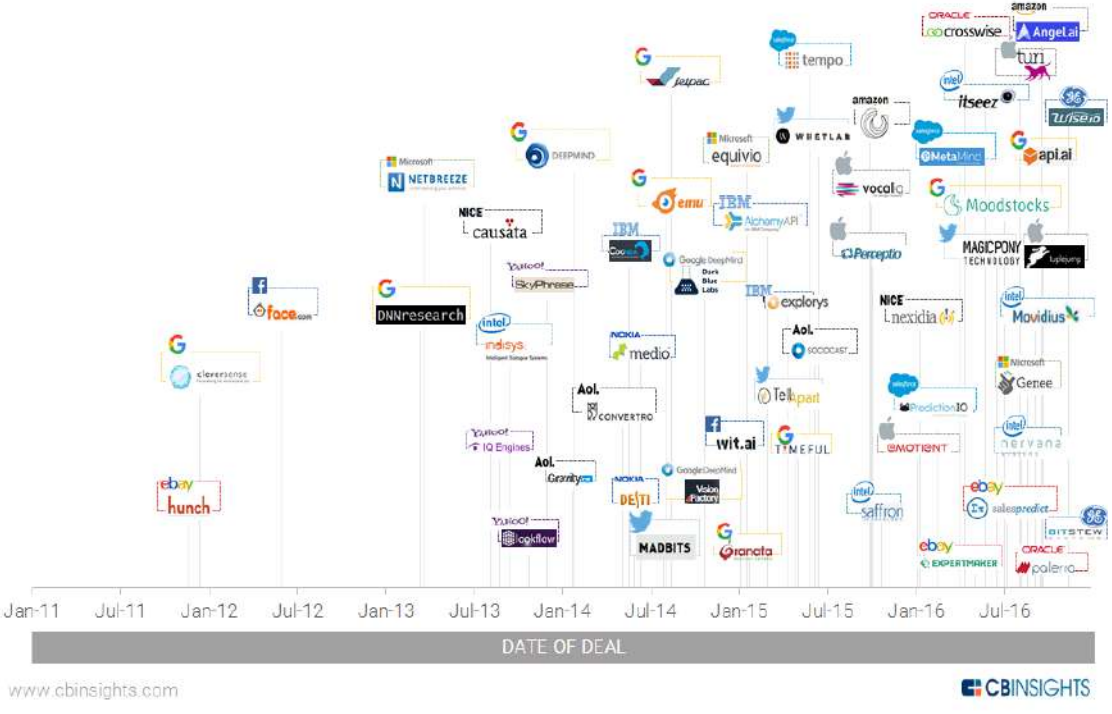
The M&A race for AI

Entering the second wave of acquisitions

200+
Acquisitions since 2012

30+
M&A deals in Q1'17

11
Acquisitions by Google



1st Wave - Tech giants:

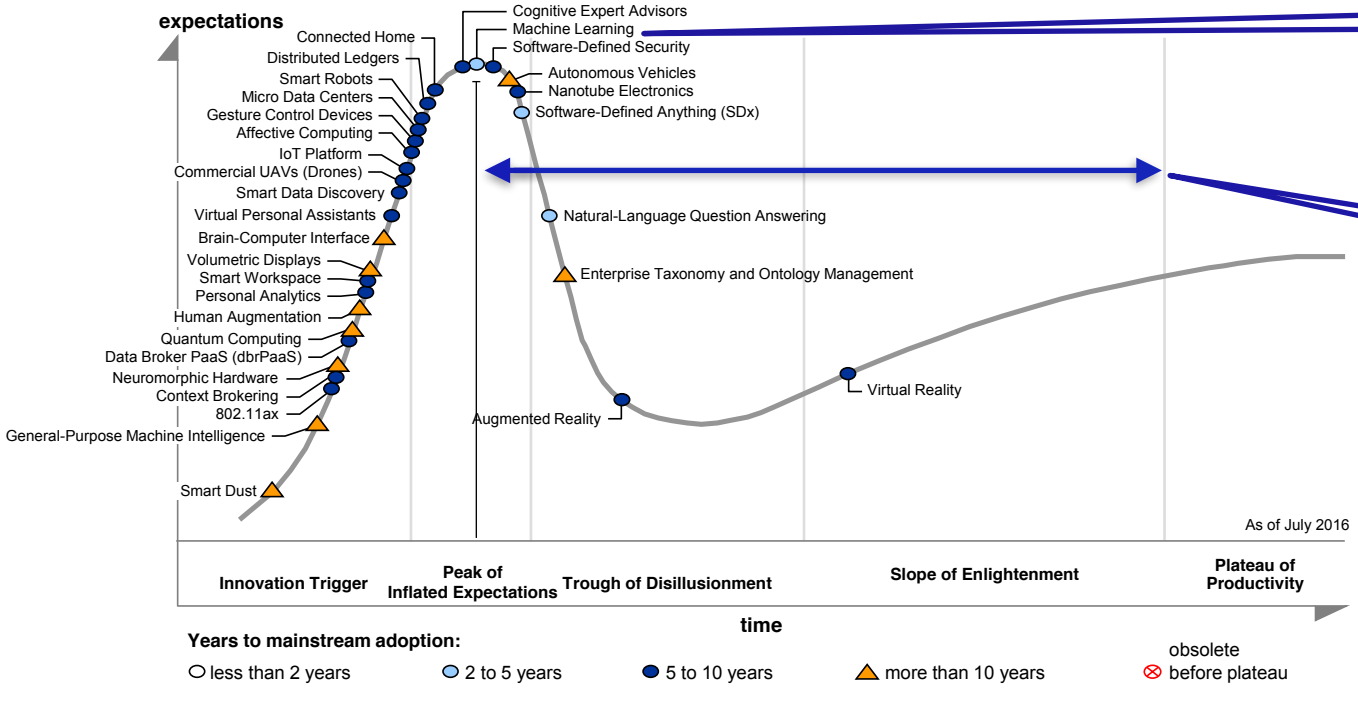
Google, Facebook, Twitter, Apple, Intel, Microsoft, IBM, Yahoo, eBay

Entering into the 2nd wave - now:

John Deere, General Electric, Ford, Samsung, Uber, Oracle, Sophos, Meltwater

Watch out! Hype ahead

Emerging Technology hype cycle: Machine Learning



We are here

2 years to mainstream

Gartner

From "Hype Cycle for Emerging Technologies, 2016," 19 July 2016 (G00299893)

First movers unfair advantage

Content

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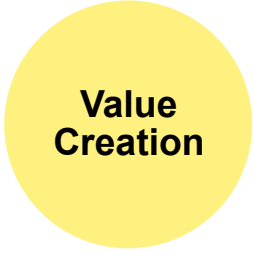
7. - *where to go next* -

Machine Learning why now

The perfect storm



01 Data

02 Algorithms

03 Hardware

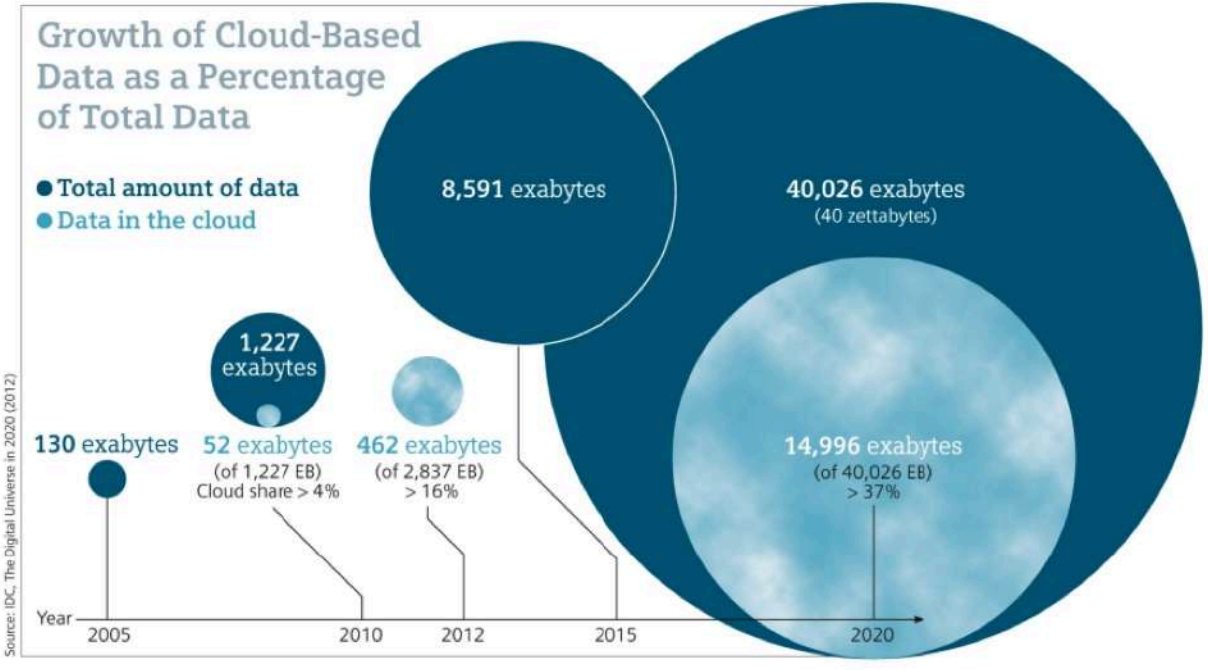
04 Talent
(*humans*)

and tools
(for humans)


BIG
DATA

Machine Learning drivers:

Data: massive datasets, 'dark' data, crowd source and open source data



Data growth:
From 8,5 EXAbytes in 2015 to 40K EXAbytes in 2020 = 40 trillion GB

15K EXAbytes in the cloud by 2020 = 37%

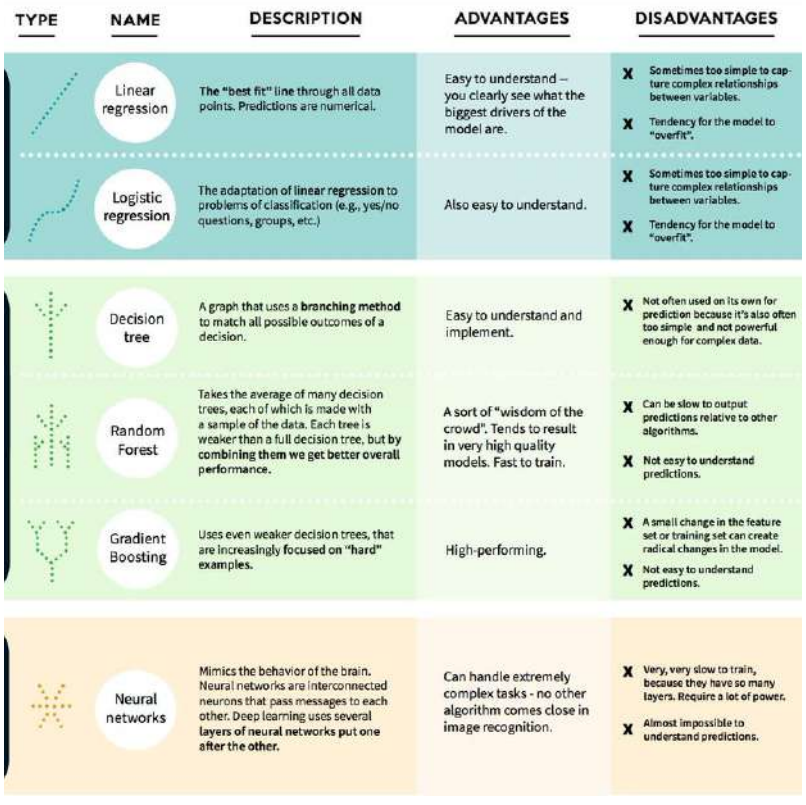
Kryders law: storage density doubles every 18 months (driven by cloud)

5G access accelerates mobile data & video

Unlocking 'dark' data & data silos in corporations

Machine Learning drivers

Algorithms



TYPE	NAME	DESCRIPTION	ADVANTAGES	DISADVANTAGES
	Linear regression	The "best fit" line through all data points. Predictions are numerical.	Easy to understand – you clearly see what the biggest drivers of the model are.	X Sometimes too simple to capture complex relationships between variables. X Tendency for the model to "overfit".
	Logistic regression	The adaptation of linear regression to problems of classification (e.g., yes/no questions, groups, etc.)	Also easy to understand.	X Sometimes too simple to capture complex relationships between variables. X Tendency for the model to "overfit".
	Decision tree	A graph that uses a branching method to match all possible outcomes of a decision.	Easy to understand and implement.	X Not often used on its own for prediction because it's also often too simple and not powerful enough for complex data.
	Random Forest	Takes the average of many decision trees, each of which is made with a sample of the data. Each tree is weaker than a full decision tree, but by combining them we get better overall performance.	A sort of "wisdom of the crowd". Tends to result in very high quality models. Fast to train.	X Can be slow to output predictions relative to other algorithms. X Not easy to understand predictions.
	Gradient Boosting	Uses even weaker decision trees, that are increasingly focused on "hard" examples.	High-performing.	X A small change in the feature set or training set can create radical changes in the model. X Not easy to understand predictions.
	Neural networks	Mimics the behavior of the brain. Neural networks are interconnected neurons that pass messages to each other. Deep learning uses several layers of neural networks put one after the other.	Can handle extremely complex tasks - no other algorithm comes close in image recognition.	X Very, very slow to train, because they have so many layers. Require a lot of power. X Almost impossible to understand predictions.

Widespread adoption of machine learning algorithms

- **ML as a Service**
- APIs
- Tools and open source libraries & ML frameworks

Faster hardware acceleration

Better input & more data

Neuroscience driving new algorithms

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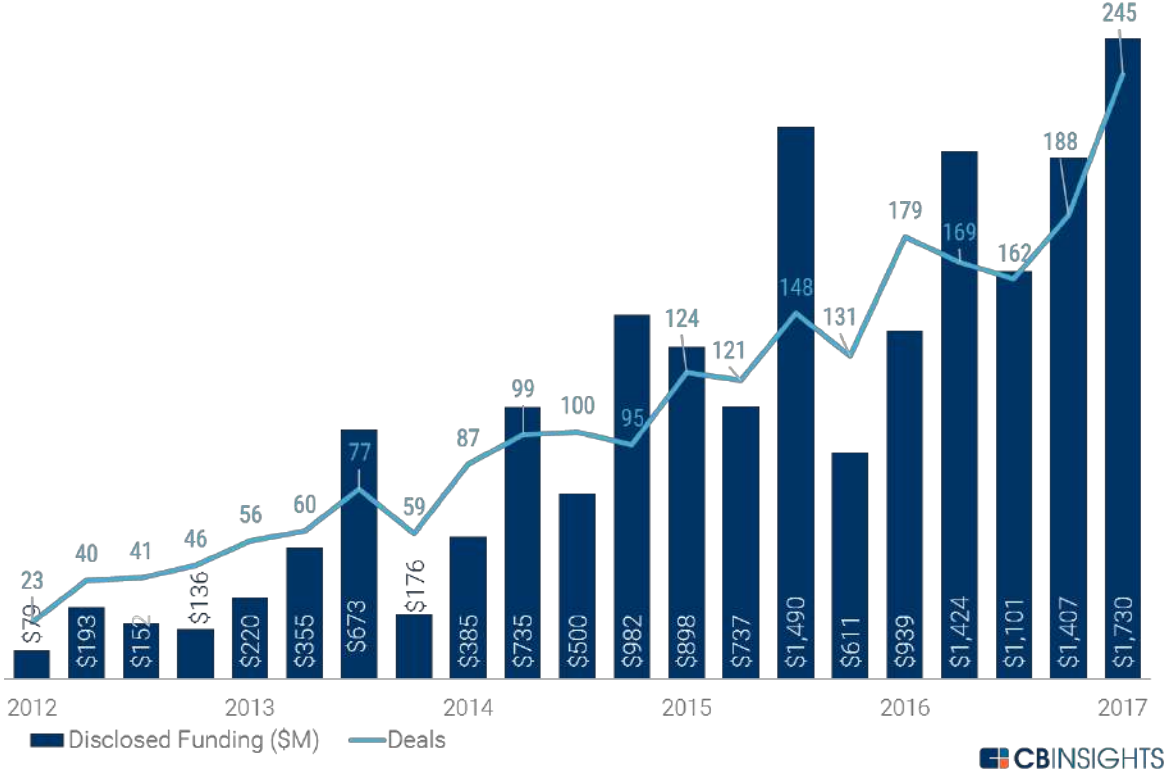
Venture Capital - Machine Learning/AI

Financing rounds



46% of AI acquired companies are VC backed

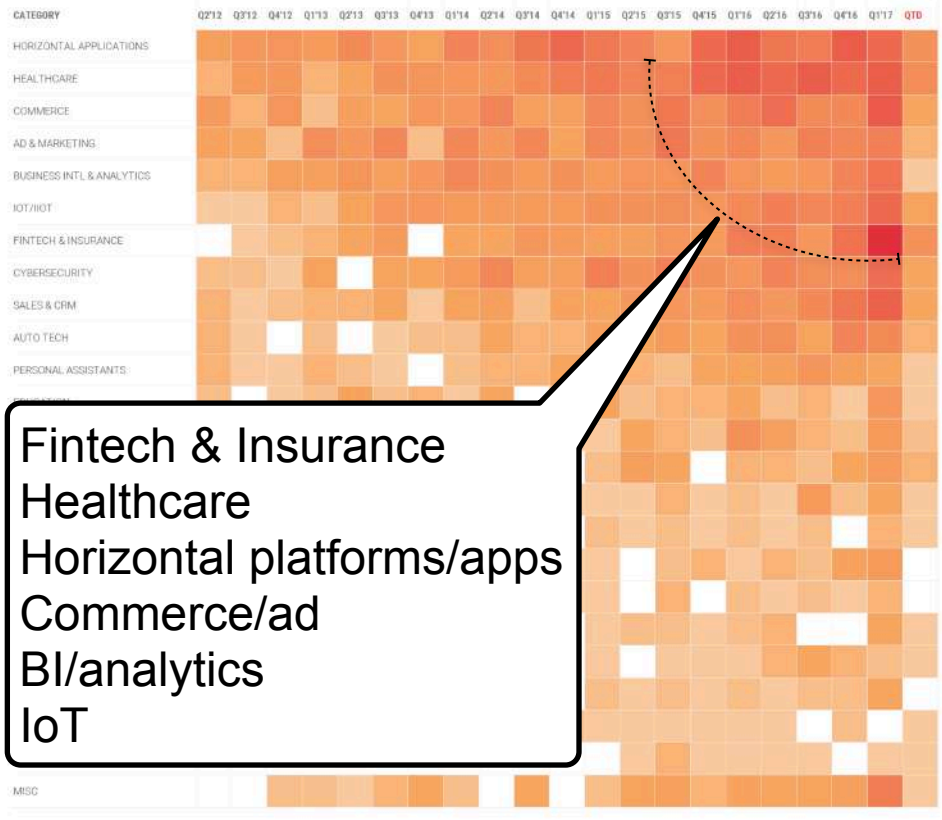
Total # of funding rounds/ deals grew **4,6x** from 150 in 2012 to 698 in 2016

245 funding deals in Q1 2017 for a total of **$1,73 Bn**

Nearly **48% in seed/angel** stage (new startups)

Venture Capital - Machine Learning/AI

Financing rounds: deal distribution by category, heat map



**The coloring corresponds to equity rounds only. The map includes startups that have raised at least one equity round since 2012, and excludes AR/VR, on-demand taxis, and hardware-focused robotics startups.*

ML is driving efficiencies, productivity and ROI for the enterprise

Savings, labor cost & automation improvement

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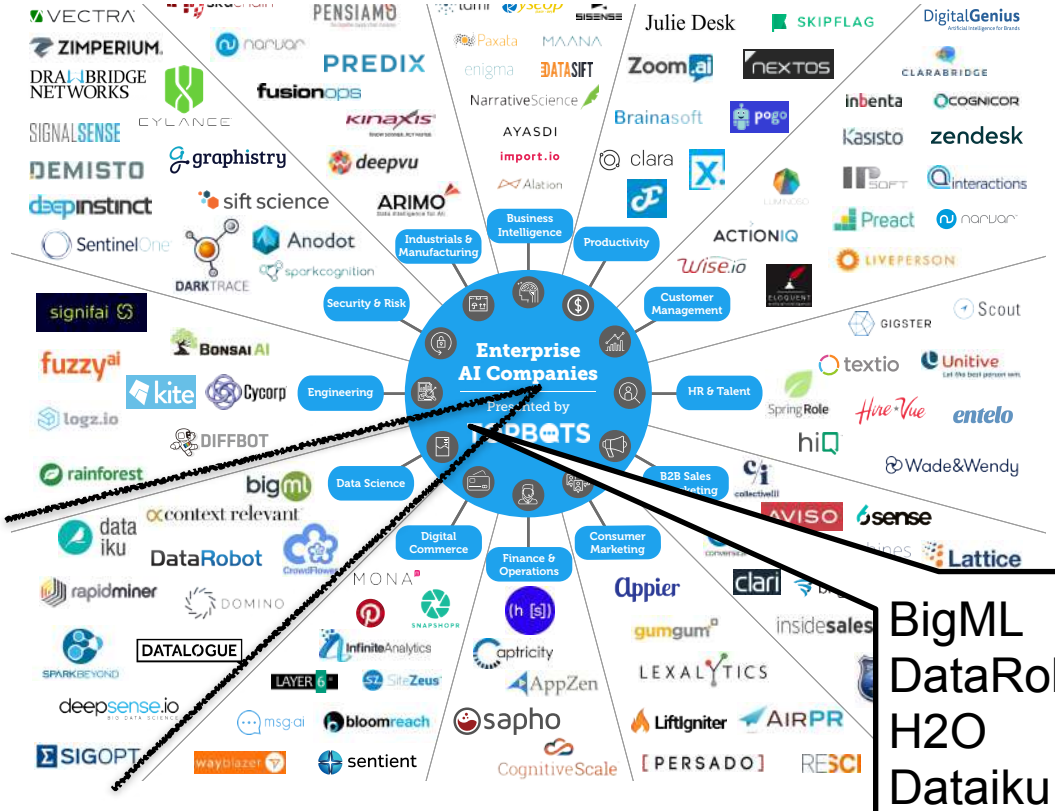
Enterprise AI start-ups to watch

Cloud Wars - MLaaS: Machine Learning as a Service



Big players AMZ, Google, MS, IBM trying to drive cloud and infrastructure by offering ML in the cloud as part of wider portfolio.

Lack of focus and customer orientation, 'small' market <$1Bn

Wrong business models, charging by prediction, black box models, can't be exported.

Greenfield for Startups

BigML
DataRobot
H2O
Dataiku

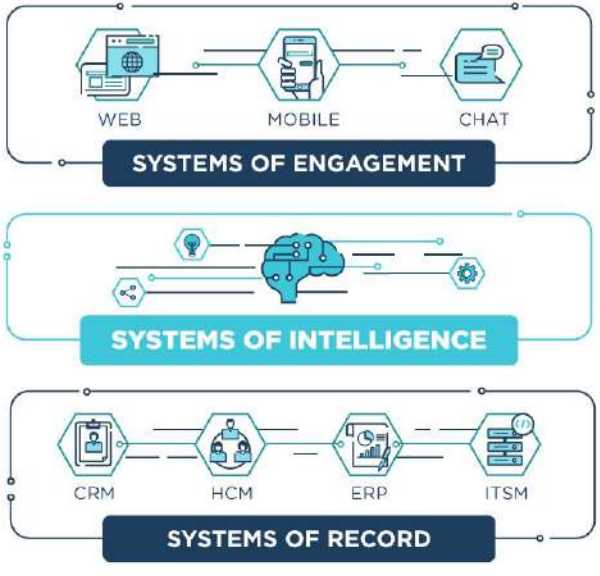
vs

Google ML API
Amazon ML
Microsoft Azure ML
IBM MLaaS

http://www.topbots.com/essential-landscape-overview-enterprise-artificial-intelligence/

Technology stack: startups to watch

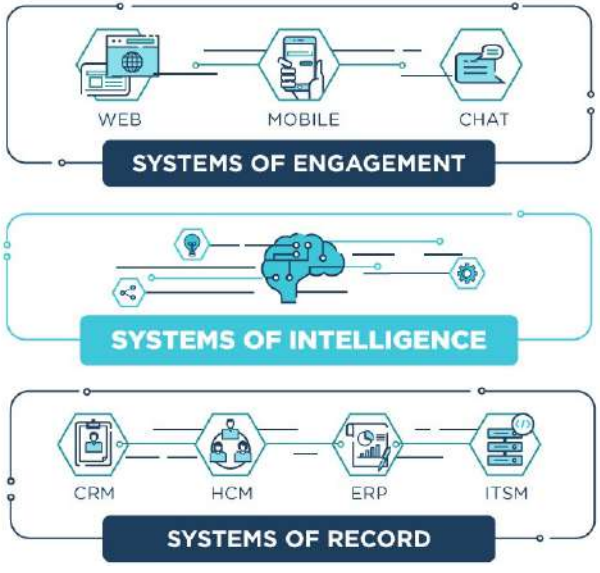
Machine Learning technology stack



Created by @MattMcilwain, @TmPorter, @SSomasegar, @DanielxLi MADRONA VENTURE GROUP

The Great Pivot - ML platform revolution

Systems of Intelligence/ML drive efficiencies (1st), competitive advantages (2nd) & next defensible business models ultimately



h/t Jerry Chen - Greylock Partners
https://news.greylock.com/the-new-moats-53f61aeac2d9

- Most large technology companies are reconfiguring themselves around ML.
- Google was (arguably) the first company to move, followed by Microsoft, Facebook, Amazon, Apple and IBM.
- 2nd tier corporations following suit: GE, Uber, even carriers as AT&T
- Not only a US phenomena - Alibaba, Baidu chief Robin Li said in an internal memo that Baidu's strategic future relies on AI
- Ultimately all global players will need to re-tool their processes adopting a ML driven approach.

Meanwhile … in 2014

BBC Sign in | News | Sport | Weather | Shop | Earth | Travel | Mo

NEWS

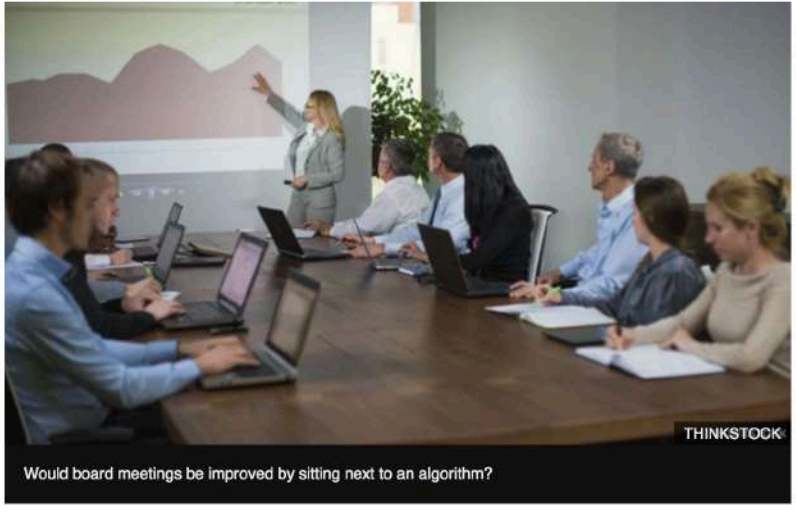
Home | Video | World | US & Canada | UK | Business | Tech | Science | Magazine | Ente

Technology

Algorithm appointed board director

16 May 2014 | Technology

Share



Would board meetings be improved by sitting next to an algorithm?

A venture capital firm has appointed a computer algorithm to its board of directors.

The program - called Vital - will vote on whether to invest in a specific company or not.

Fast-Forward to 2017: MWC - 4YFN

MWC - 4YFN: Mobile World Congress - 4 Years From Now

Category: Startup Battle

PreSeries' Algorithm Chooses Pixoneye as the Startup Most Likely to Succeed

PreSeries, the joint venture between Telefónica Open Future_ and BigML, staged the fourth edition of the Artificial Intelligence Startup Battle yesterday (Tuesday, February 28). The event

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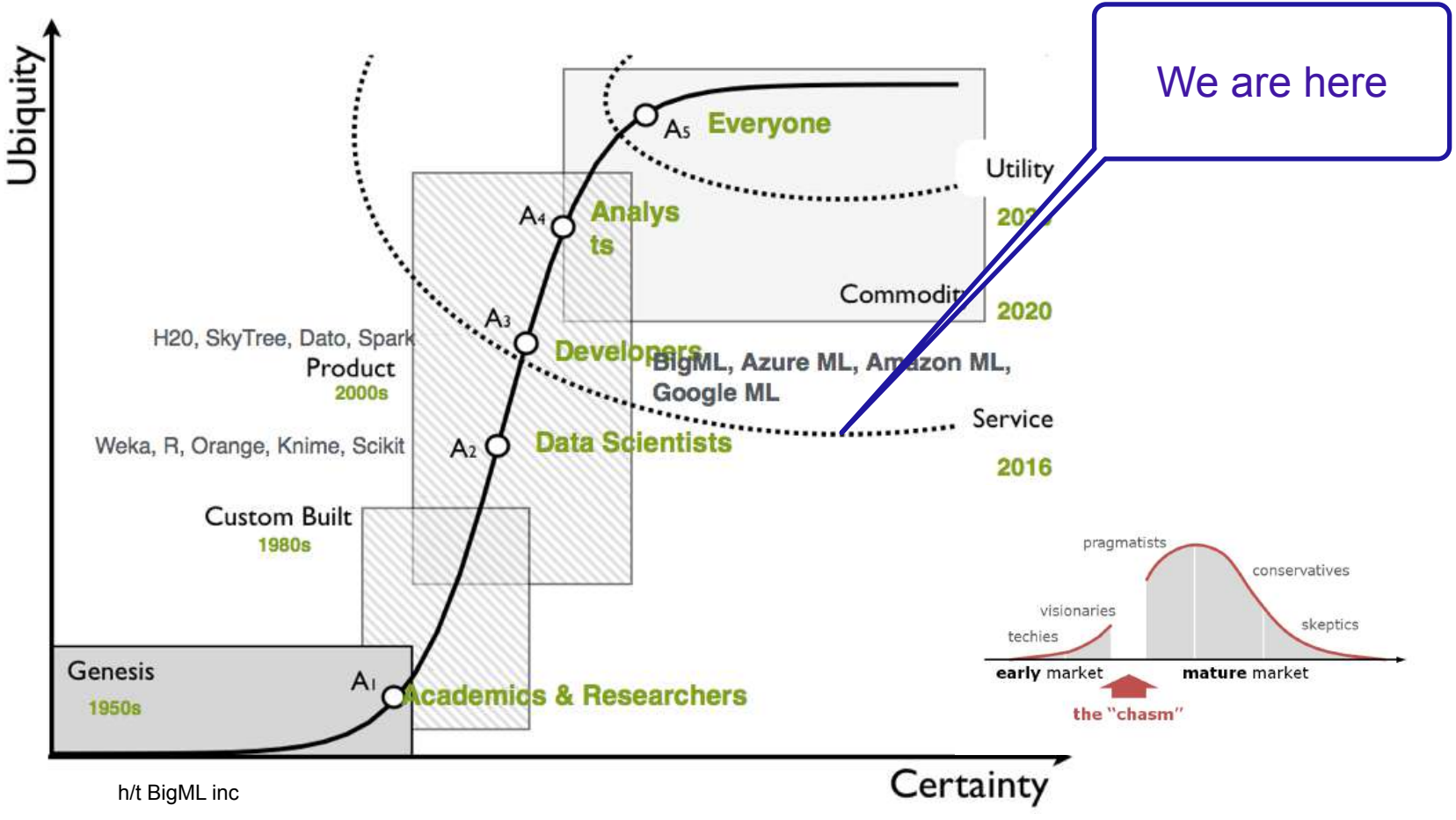
Machine Learning Adoption

Applying machine learning at scale



h/t BigML inc

Amazon

Jeff Bezos' letter to Amazon shareholders - May, 2017

Newsletter signup Cloud Tech

Jeff Bezos explains Amazon's artificial intelligence and machine learning strategy

BY TODD BISHOP on May 6, 2017 at 9:46 am

Post a Comment | f Share 567 | Tweet | Share 1.6k | Reddit | Email

Amazon CEO Jeff Bezos appeared this week at the Internet Association's annual gala

"Machine learning and AI is a horizontal enabling layer. It will empower and improve every business, every government organization, every philanthropy — basically there's no institution in the world that cannot be improved with machine learning" .

Jeff Bezos

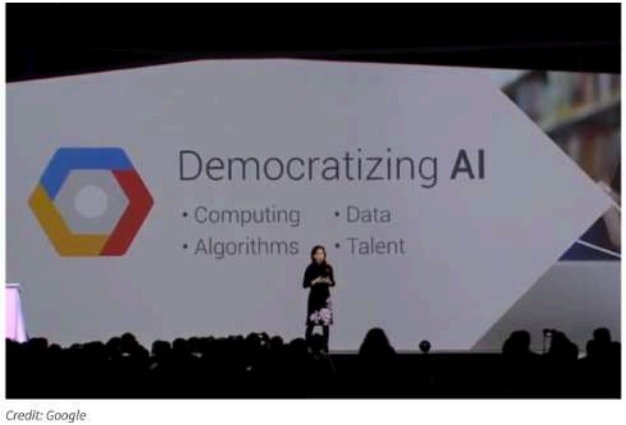
Google

FBlearner Flow: Facebook's ML platform for internal use - March, 2017

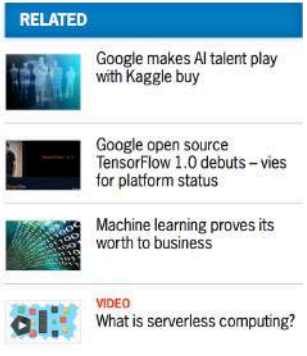
4 ways Google Cloud will bring AI, machine learning to the enterprise

The mystery of why Stanford's renowned head of AI research, Fei-Fei Li, joined Google finally answered

By Steven Max Patterson
Network World | MAR 9, 2017 9:17 AM PT



Credit: Google

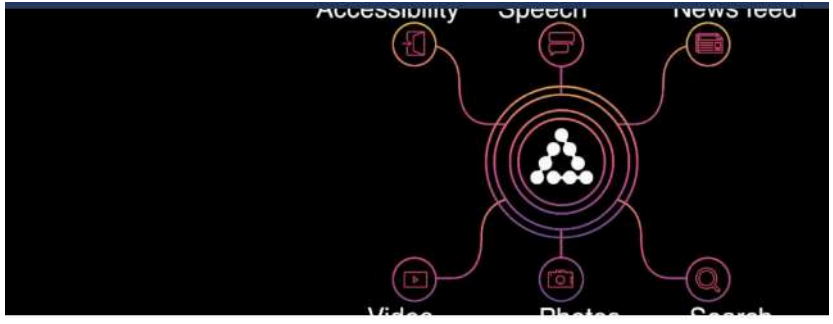


Google MLaaS was released in Beta to developers in 2016

Internal use since 2015

Facebook

FBlearner Flow: Facebook's ML platform for internal use - May, 2016



May 9, 2016 · INFRA · DATA · ARTIFICIAL INTELLIGENCE · RESEARCH · NEWS FEED · PYTHON

Introducing FBLearner Flow: Facebook's AI backbone

Jeffrey Dunn

Many of the experiences and interactions people have on Facebook today are made possible with AI. When you log in to Facebook, we use the power of machine learning to provide you with unique, personalized experiences. Machine learning models are part of ranking and personalizing News Feed stories, filtering out offensive content, highlighting trending topics, ranking search results, and much more. There are numerous other experiences on Facebook that could benefit from machine learning models, but until recently it's been challenging for engineers without a strong machine learning background to take advantage of our ML infrastructure. In late 2014, we set out to redefine machine learning platforms at Facebook from the ground up, and to put state-of-the-art algorithms in AI and ML at the fingertips of every Facebook engineer.

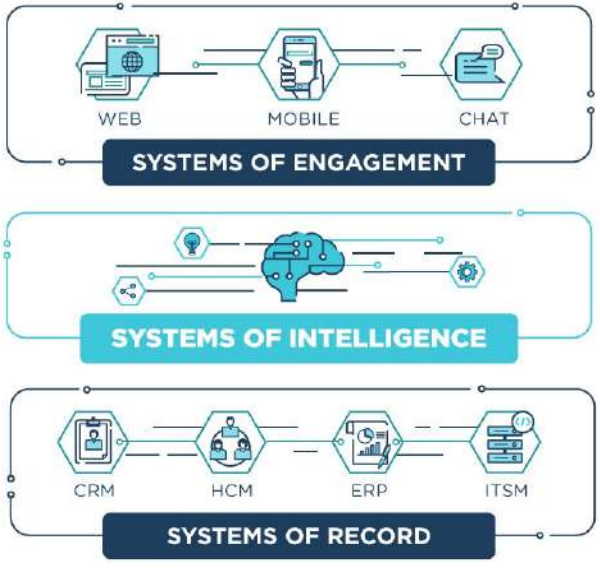
Facebook ML platform is used by more than 25% of its engineering team

+1Mn ML models trained

+6 Mn predictions/sec

The Great Pivot - ML platform revolution

Systems of Intelligence/ML drive efficiencies (1st), competitive advantages (2nd) & next defensible business models ultimately



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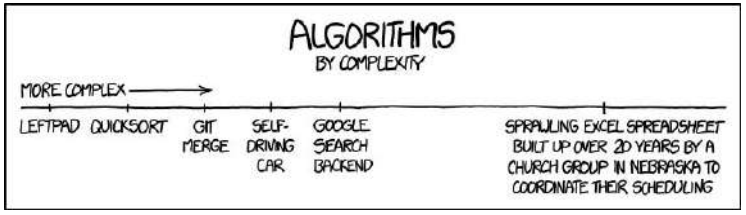
Where to go next

A few tips for machine learning success



- Focus on Features (vs Algorithms)
- Same with Data (vs Algorithms): right data, clean data
- Faster trial & error, rapid prototyping (vs Algorithms)
- Use tools & ML platforms, cloud is friendly (Algorithms aren't)
- See next 5 min - DIY machine learning sales hack (and forget Algorithms)

http://www.pcmag.com/article/353293/7-tips-for-machine-learning-success

Sales Hacking with Machine Learning

DIY practical example:

WHAT

A practical sales hack using machine learning to identify & engage in real time your competitor's unhappy users

HOW

- Twitter
- Monkeylearn
- Slack
- Zapier

REQUIREMENTS

- a laptop with WiFi connectivity
- 10 min of undivided attention time
- Twitter, Monkeylearn, Slack & Zapier free accounts
- Cup of coffee (to look cool while setting it up)

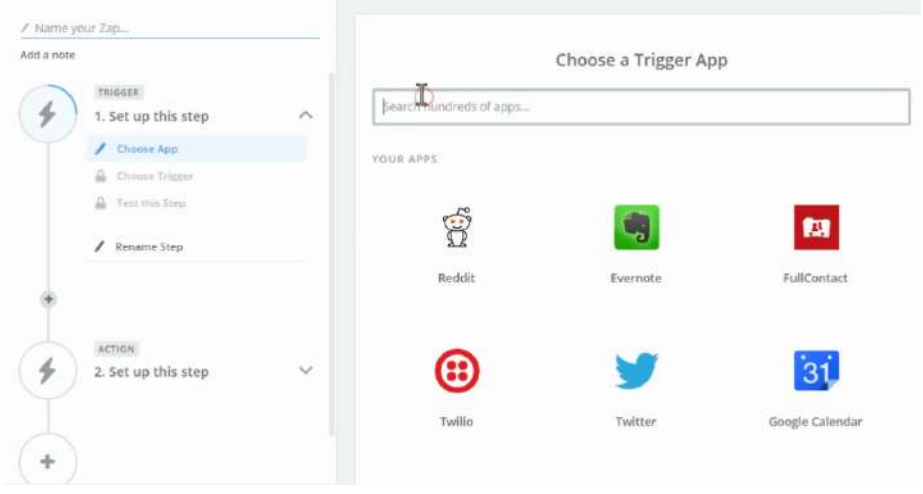
Monitor mentions on competitors in social media

Trigger: automatically analyze and classify mentions using **machine learning** and detect users complaining

Alert & Action: notify sales team for real time action & engagement

Automate process, set up rules, **integrate** services

Min 1: Monitor & Trigger



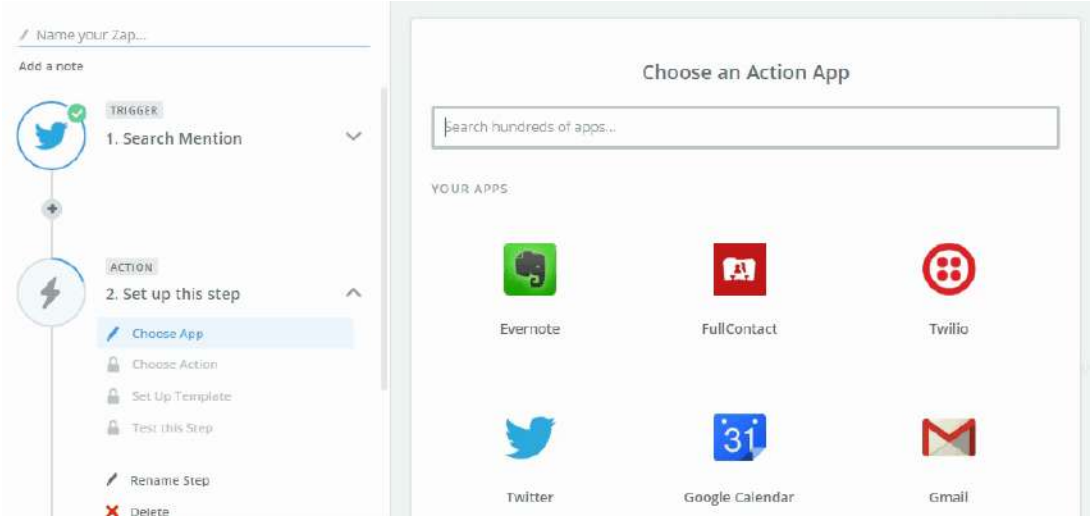
Steps:

1. Create a Zap.
2. Select **Twitter** as Trigger App.
3. Select Search Mention as **Trigger**.
4. Input your **competitor** search query: trigger whenever someone mentions **competitor**.

Type in:
“[NameOfCompetitor] **bad service** filter:retweets”

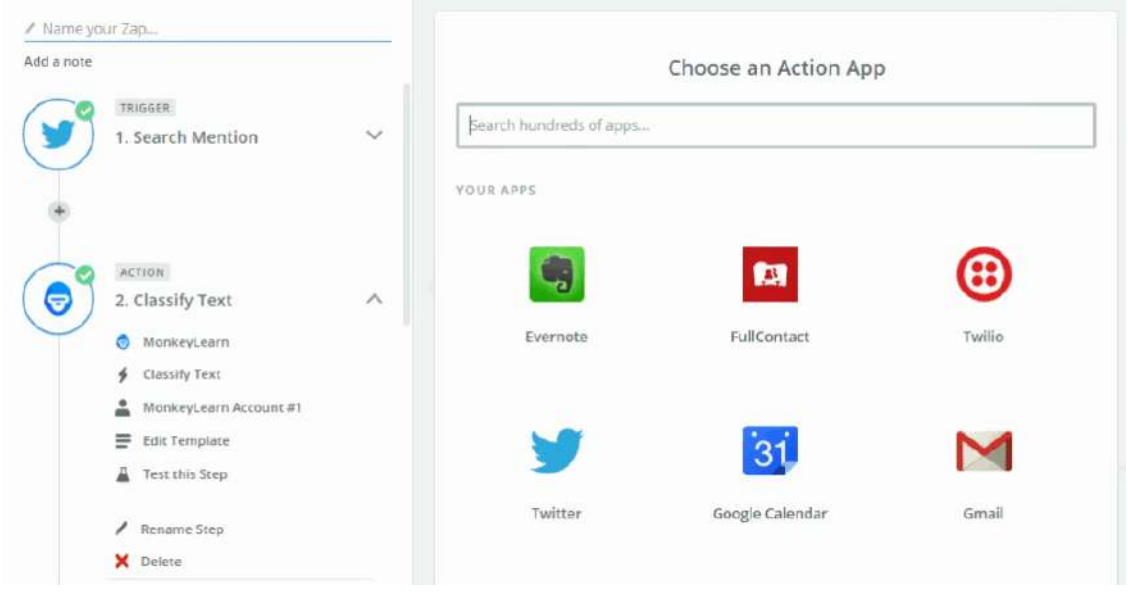
Filtering out tweets not referring to ‘bad service’ and retweets.

Min 3: Apply Machine Learning



4. Select MonkeyLearn as Action App.
5. Select Classify Text as Action.
6. Select a Sentiment Analysis Model. Classify your competitors mentions: Negative, Neutral or Positive tweets. You can use a pre-trained model or eventually train your own custom model.
7. Select text to classify (Tweet text)

Min 5: Filter & Trigger Alert & Action



8. Select Filter Action App.
9. Filter out Positive and Neutral tweets, only continue with negative
10. Select Slack Action App. A slack notification will arrive at the selected channel.

What the *_heck_* just happened

Technical Debt - Legacy vs lean/API and cloud

	Corporate	Startup
IT infrastructure	HW/SW provisioning	$0 - cloud
Integration	1 month, internal budget or 3rd party	Zapier pro plan - $30/month
Personnel	Data Scientist - IT experts	Part time Uber driver & developer
Testing & deployment	1-3 months	same day
CAC	inbound sales/ CRM	Chatbot

Monitor mentions on competitors in social media

Trigger: automatically analyze and classify mentions using **machine learning** and detect users complaining

Alert & Action: notify sales team for real time action & engagement

Automate process, set up rules, **integrate** services

Thanks

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