

CBINSIGHTS

THE STATE OF ARTIFICIAL INTELLIGENCE

Recent advances, startup landscape, the road ahead

A FEW OF OUR HAPPY CUSTOMERS

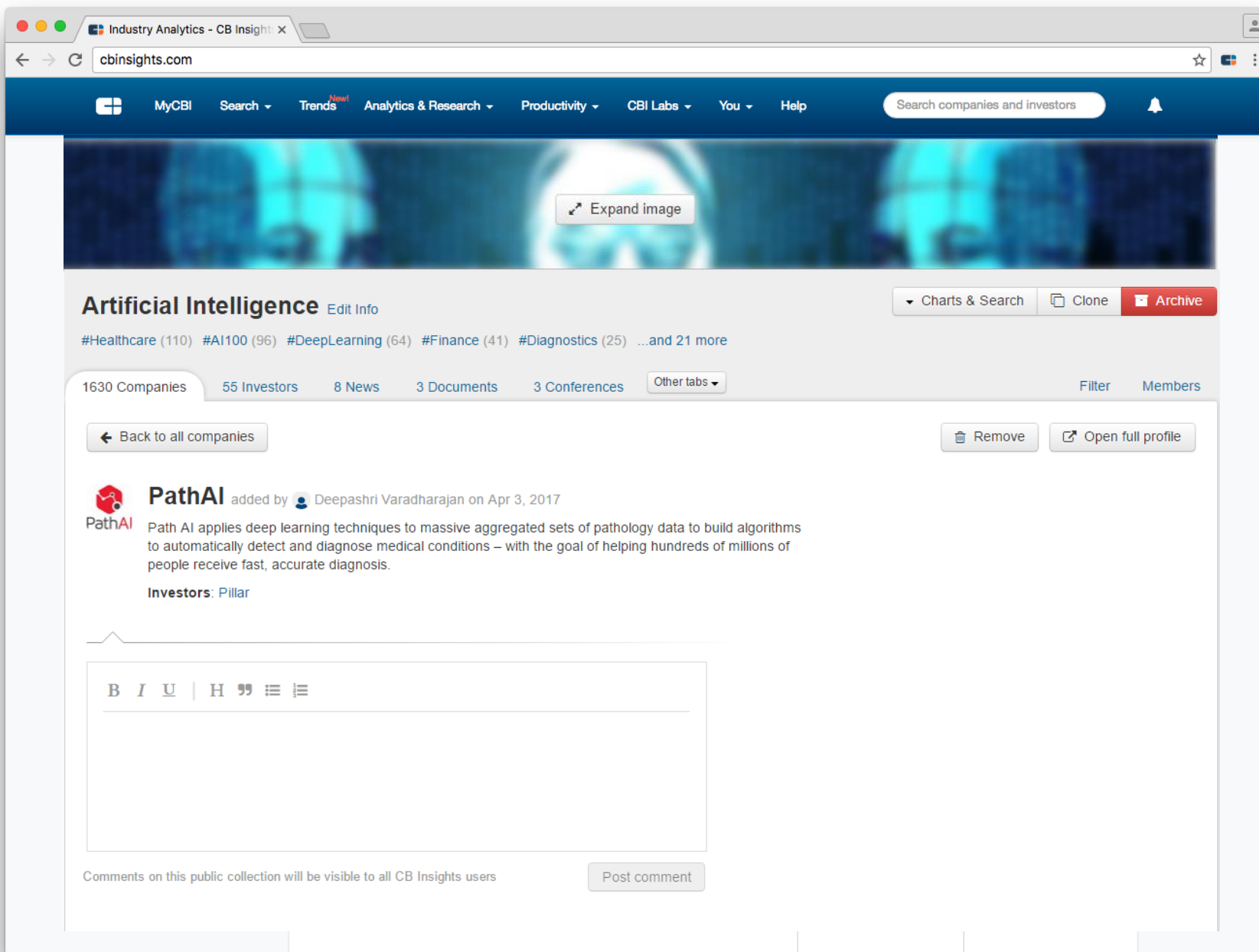
The most publicly reference-able customers of anyone in the industry

“CB Insights' **intuitive user interface**, analytical capabilities, and detailed investment information create a very **powerful tool** for our team's research needs.”

Nate D'Anna

Cisco, Corporate Development





Industry Analytics - CB Insights x
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Expand image

Artificial Intelligence [Edit Info](#)

#Healthcare (110) #AI100 (96) #DeepLearning (64) #Finance (41) #Diagnostics (25) ...and 21 more

1630 Companies 55 Investors 8 News 3 Documents 3 Conferences Other tabs Filter Members

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PathAI added by [Deepashri Varadharajan](#) on Apr 3, 2017

PathAI Path AI applies deep learning techniques to massive aggregated sets of pathology data to build algorithms to automatically detect and diagnose medical conditions – with the goal of helping hundreds of millions of people receive fast, accurate diagnosis.

Investors: [Pillar](#)

B I U | H ” ≡ ≡

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ACCESS THE AI COLLECTION WITH 1.6K+ COMPANIES

Collections, our CRM for Innovation, lets your team easily use our data to create, and collaborate on market maps, target lists and sector reviews.

No more unwieldy spreadsheets, email chains, and PowerPoint.

Knowledge management done right.

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The 'artificial general intelligence' debate

THE TECH INDUSTRY'S AI REVOLUTION

'AI IS THE NEW ELECTRICITY'



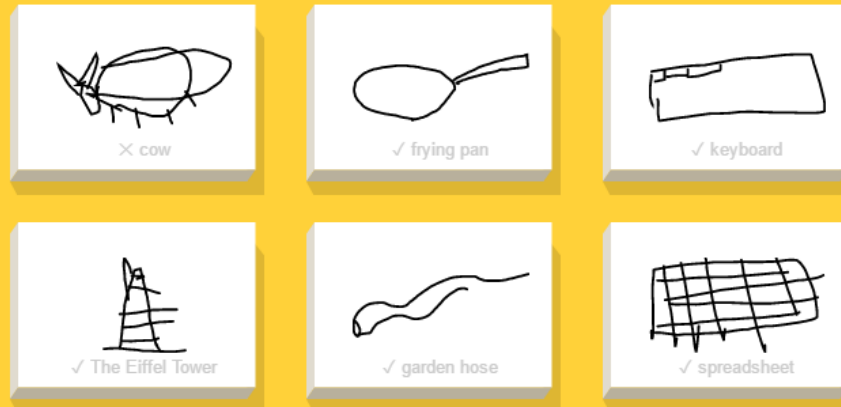
“Just as electricity transformed almost everything 100 years ago, today I actually have a hard time thinking of an industry that I don’t think AI will transform in the next several years.”

Andrew Ng

Former chief scientist at Baidu, Co-founder at Coursera

Well drawn!

Our neural net figured out 5 of your doodles.
But it saw something else in the other 1.
Select one to see what it saw.



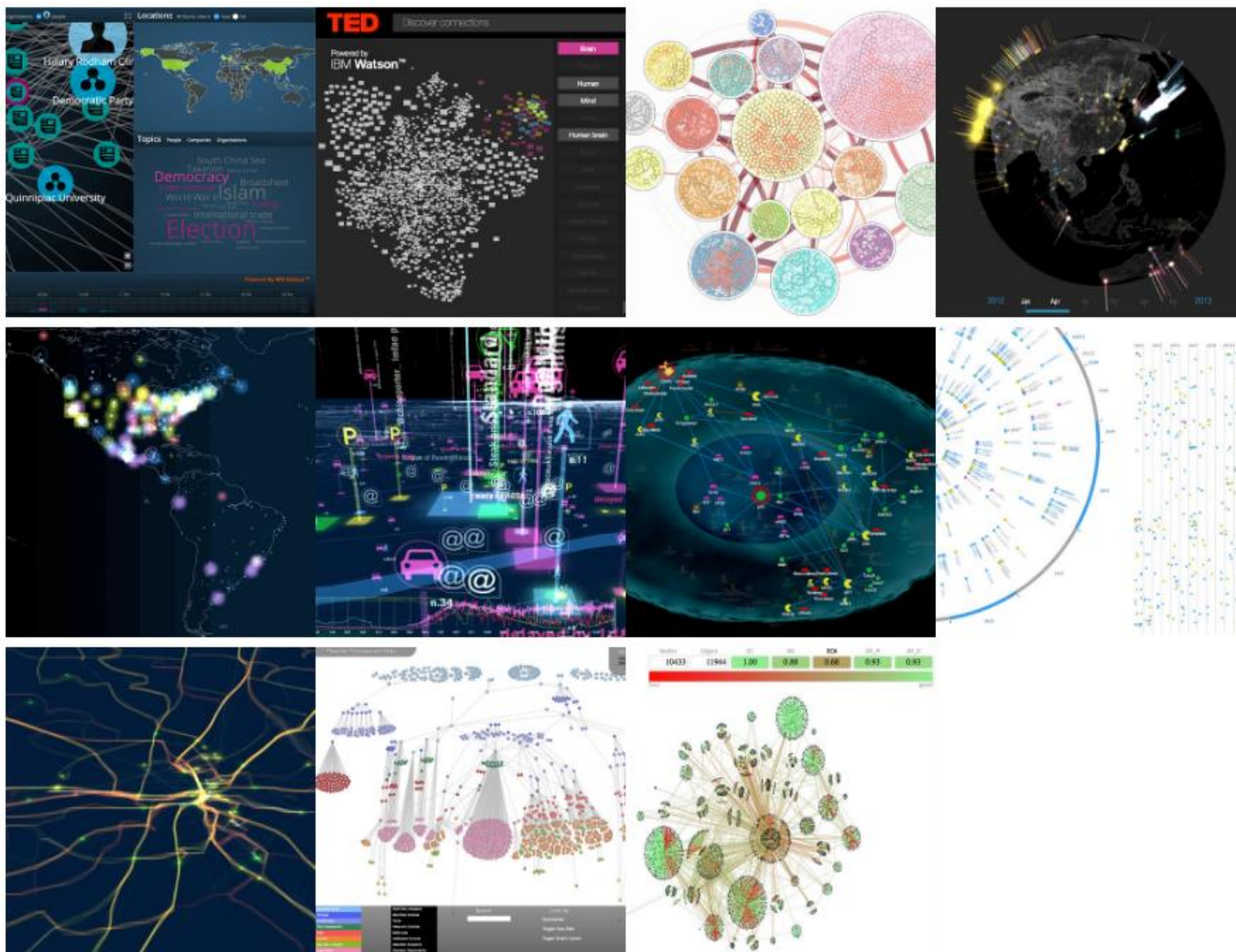
Share your drawings



Play Again

GOOGLE'S AI GUESSED (MOST OF) OUR DOODLES

Yes, even that garden hose...



IBM WATSON EXPANDS ITS REACH

From Watson health cloud to IoT solutions, IBM is quickly expanding the reach and adoption of its cognitive computing platform across multiple industries.

ALEXA AND THE VOICE REVOLUTION

From calling an Uber to cooking tips, Amazon's Alexa is changing how you interact with apps.



"Alexa, ask My Chef what's expiring."



"Alexa, ask Uber to request a ride."



"Alexa, ask Fitbit how I slept last night."



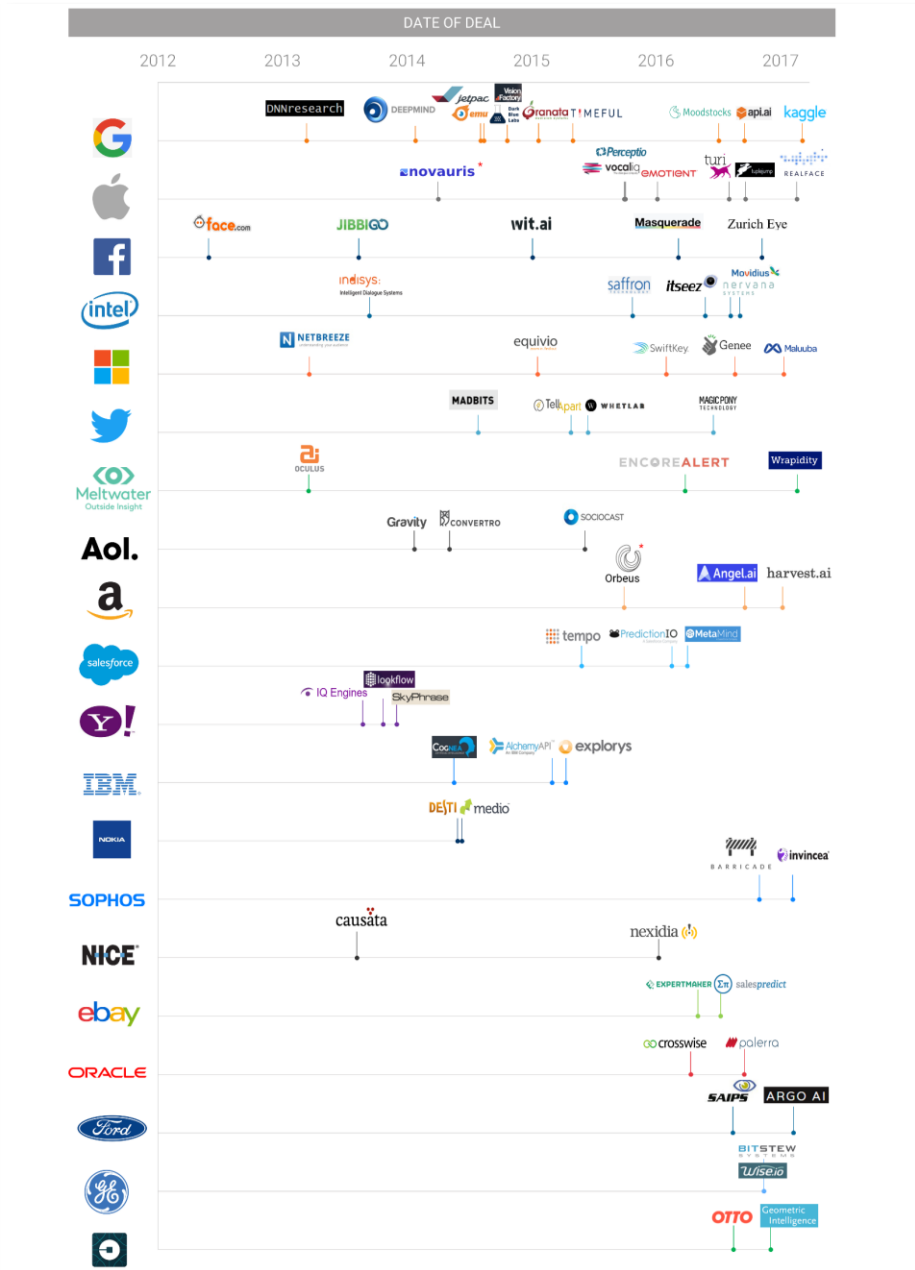
"Alexa, what's in the news?"



"Alexa, ask the bartender, what's in a Tom Collins?"



"Alexa, tell Tide I have a juice stain."



RACE FOR INTELLIGENCE

Google, Facebook, Apple, Intel and other big corporations acquiring AI startups

200+

Acquisitions
since 2012

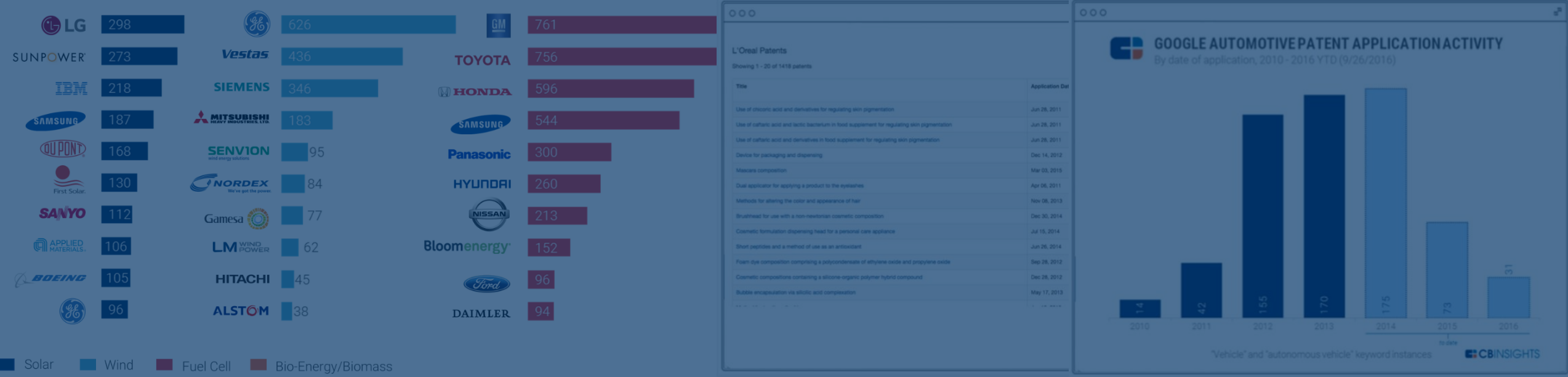
30+

M&A deals in
Q1'17

11

Acquisitions by
Google

Google is the most active acquirer of AI startups, having acquired 11 startups since 2012. Apple, which has been ramping up its M&A efforts, ranked second with 7 acquisitions under its belt. Newer entrants in the race include Ford, which acquired Argo AI for \$1B in Q1'17, cybersecurity company Sophos, and Amazon.

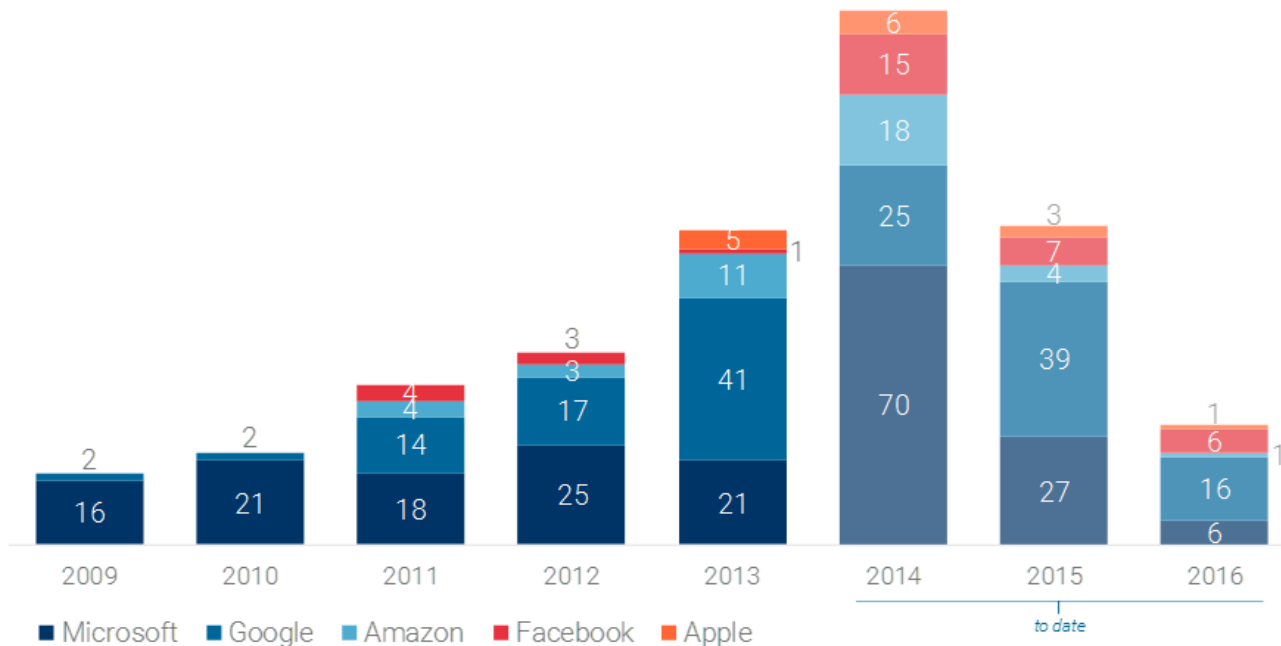


MARRYING PATENTS WITH CB INSIGHTS DATA

Analysis of patents provides forward-looking insight into corporate product strategy and innovation, as well as where technology innovation is happening and going.

AI PATENTS OF MICROSOFT, GOOGLE, AMAZON, FB, APPLE

as of 12/12/2016



Analysis filters patent titles and abstracts for select relevant keywords, e.g. machine learning, deep learning, neural network, etc. Does not include pre-acquisition patent activity of purchased companies (e.g. DeepMind with Google)



Note: The patent filing process involves a significant time-lag before the publishing of patent applications. This delay can range from several months to over two years, meaning that records prior to 2013 are likely complete at the time of analysis, but there may be applications from 2014 on that have yet to be published.

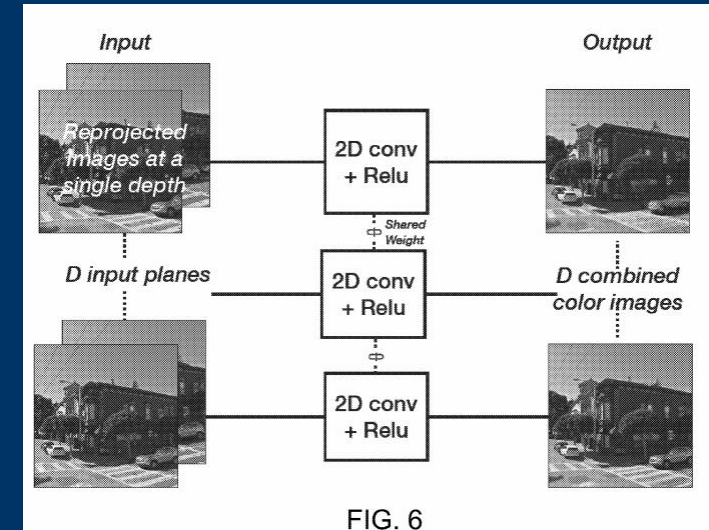


FIG. 6

Google patent to "predict new views from existing images" using deep learning

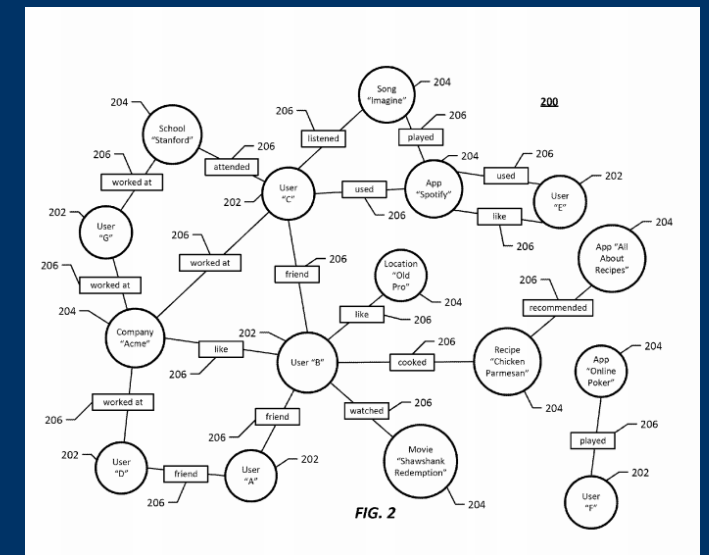
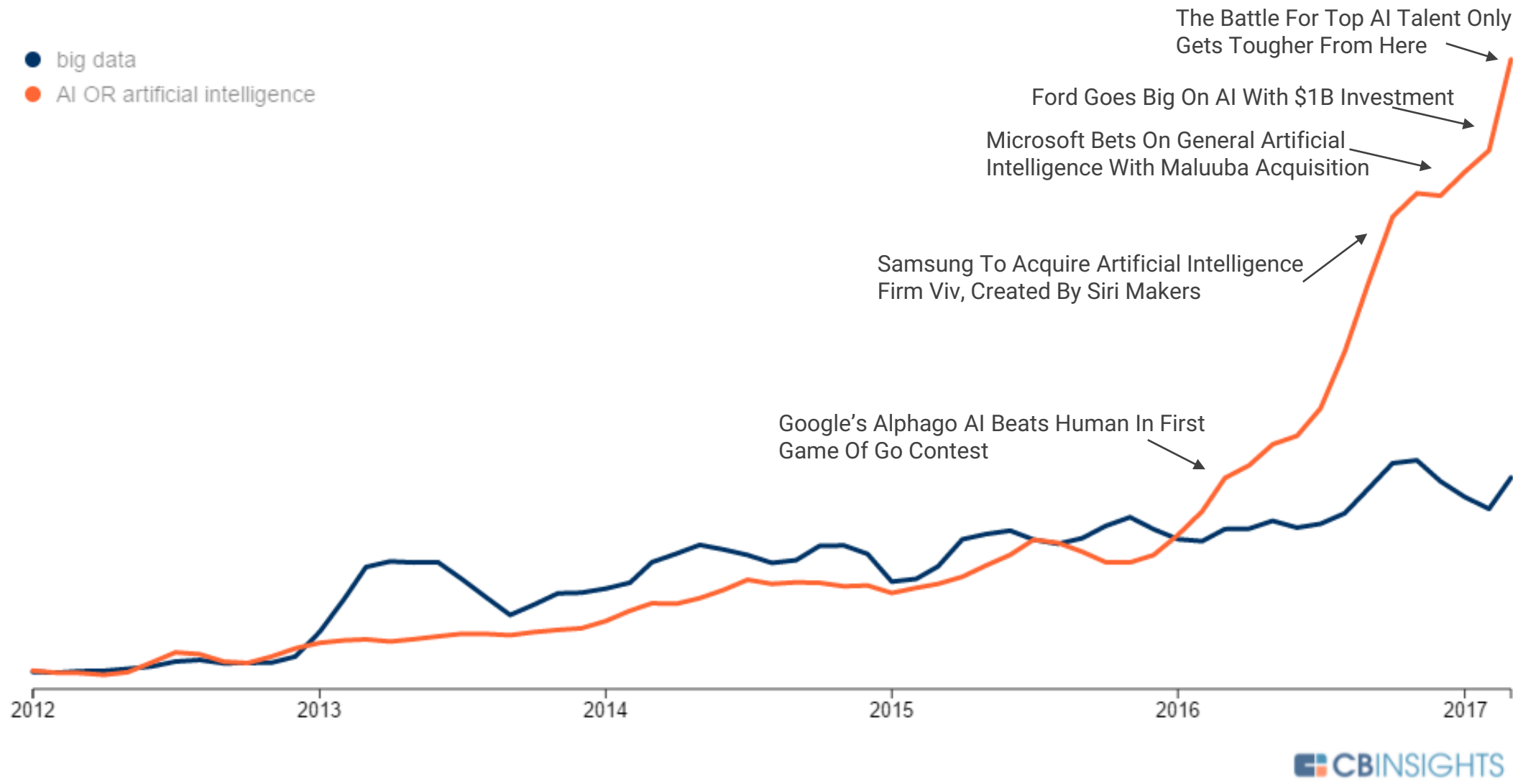


FIG. 2

Facebook's patent for "predicting labels using deep learning model"

MEDIA TRENDS: AI VS BIG DATA





Why now? **MACRO TRENDS, RECENT ADVANCES**



Big Data + Processing Power =
**New Age for
Artificial Intelligence**

"Deep learning is almost like the brain... It's unreasonably effective. You can teach it to do almost anything. But it had a huge handicap: It needs a massive amount of computation. And there we were with the GPU, a computing model almost ideal for deep learning."

Jen-Hsun Huang
CEO, NVidia

HORSEPOWER FOR AI: NVIDIA GPU'S DOMINATE MARKET

NVIDIA GPUs, which initially targeted the gaming industry, are now widely used for training deep neural networks.

Other big corporations like Intel and Google have focused their efforts on AI chips as well, with Intel recently acquiring startup Nervana Systems, and Google developing a custom chip called “Tensor Processing Unit.”

A DGX-1
computer



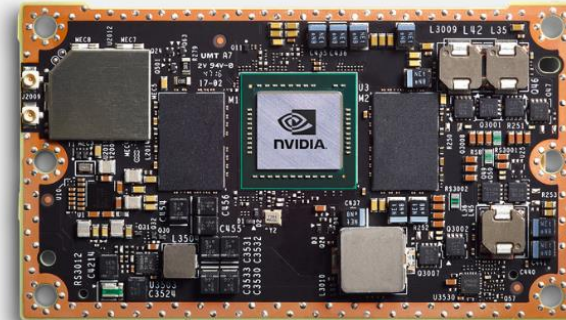
ORDER NOW

WORLD'S FIRST AI SUPERCOMPUTER IN A BOX

AI at the Edge

High-performance, low-power NVIDIA Jetson TX2 enables on-board complex data processing in everything from robots and drones to self-driving cars, autonomous vehicles, and intelligent cameras.

256-core NVIDIA Pascal™ architecture and 8 GB of memory deliver over 1 Teraflops of performance, 64-bit CPUs, and 4K video encode/decode capabilities with power efficiency at just 7.5 watts



The Fastest Deep Learning Training

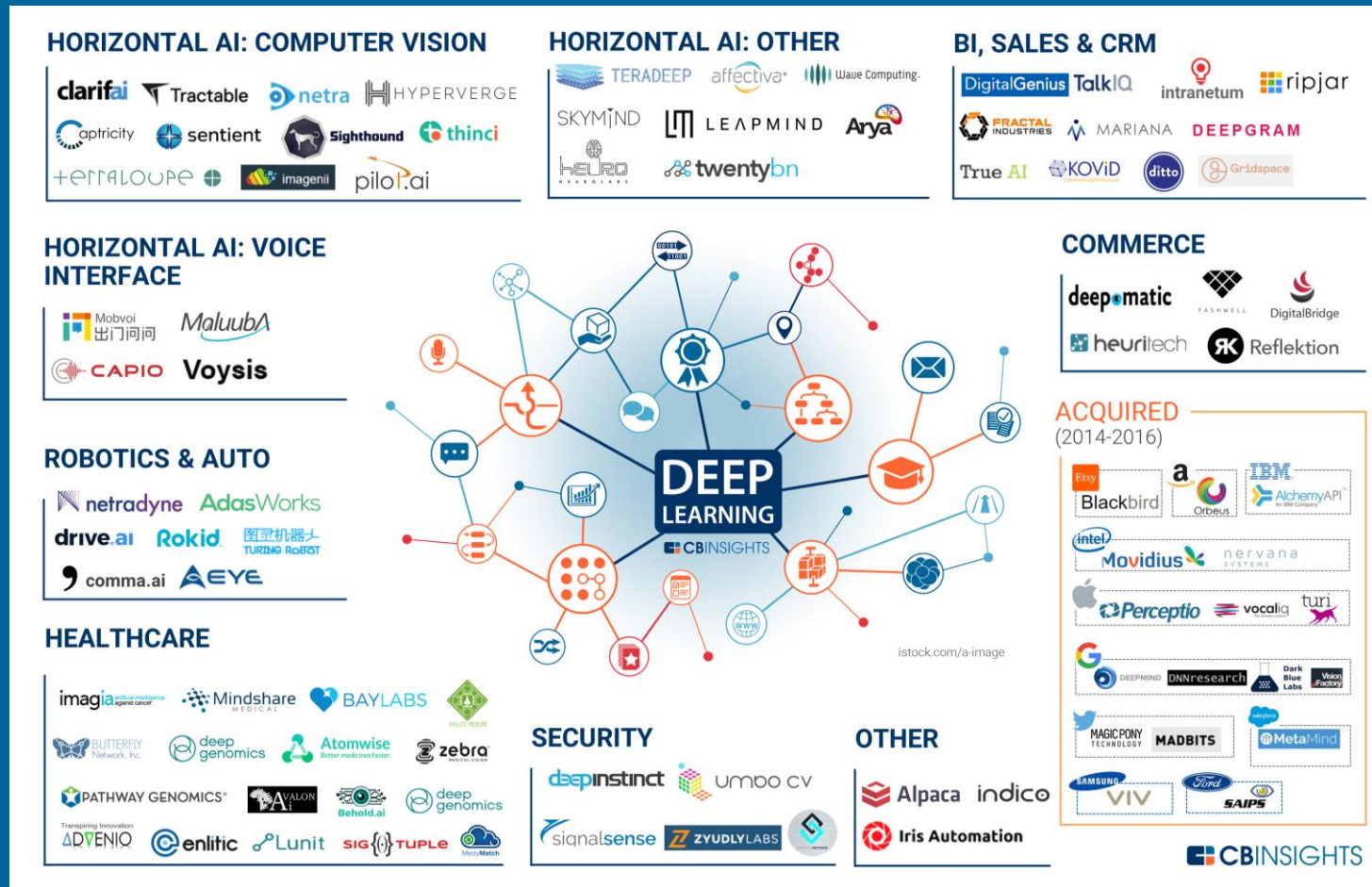
Accelerator for PCs

Supercharge your desktop development system with the new NVIDIA TITAN X GPU. Powered by the world's most advanced GPU architecture, NVIDIA Pascal™, the TITAN X delivers 11 GFLOPS of parallel computing performance and is packed with 3584 NVIDIA® CUDA® cores and 12GB of GDDR5X memory.

READ STORY



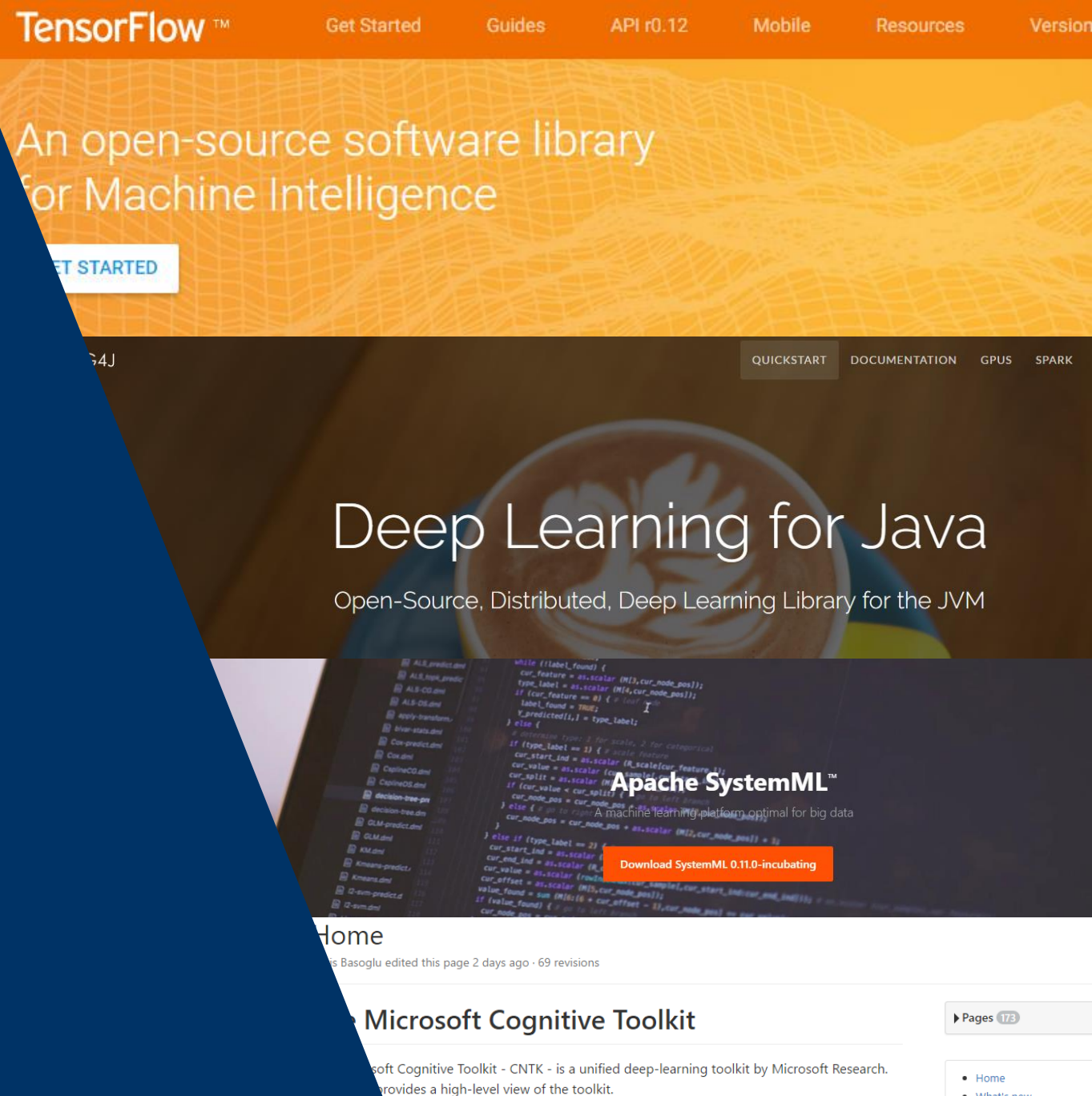
STARTUPS RIDING THE DEEP LEARNING WAVE



To name a few, Captricity, which extracts information from hand-written data, raised \$49M in equity funding from investors including Social Capital and New York Life Insurance Company. Teradeep received funding in Q1'16 from the corporate venture arm of XILINX to make programmable integrated circuits. Healthcare startups here include IBM-backed precision medicine startup Pathway Genomics and diagnostics company Enlitic.

OPEN SOURCE SOFTWARE ACCELERATES RESEARCH

Google open sourced its TensorFlow machine learning library in 2015, and reportedly “more than 480 people have contributed directly to TensorFlow” since then. Other libraries include Deeplearning4J from startup Skymind and Microsoft’s Cognitive Toolkit.



RECENT ADVANCES IN AI

ELON MUSK LAUNCHES NEURALINK, A
VENTURE TO MERGE THE HUMAN
BRAIN WITH AI

March 27, 2017

THE VERGE

NEW ARM CHIP ARCHITECTURE
PROMISES BIG BOOST TO ARTIFICIAL
INTELLIGENCE

March 21, 2017

Forbes

NVIDIA'S DEEP-LEARNING CHIPS MAY
GIVE MEDICINE A SHOT IN THE ARM

**MIT
Technology
Review**

March 28, 2017

IT BEGINS: BOTS ARE LEARNING TO
CHAT IN THEIR OWN LANGUAGE

WIRED

March 16, 2017

INTEL'S ROAD TO SELF-DRIVING CARS
IS PAVED IN ACQUISITIONS

March 13, 2017

FORTUNE

“Despite these astonishing advances, we are a long way from machines that are as intelligent as humans—or even rats. So far, we’ve seen only 5% of what AI can do.”

Yann LeCun

Director of research, Facebook





Where are we at?

AI TODAY, STARTUP TRENDS, APPLICATIONS

A few AI applications today

A LOT OF NUMBER CRUNCHING

VISION

LANGUAGE PROCESSING

BUSINESS INTELLIGENCE

IOT PREDICTIVE
MAINTENANCE

SEARCH RECOMMENDATIONS

FORECASTING MODELS

AUTO TECH AND DRONE
COLLISION AVOIDANCE

E-COMMERCE SEARCH

PICK AND PLACE ROBOTS

HEALTHCARE DIAGNOSTICS

CHATBOTS

NEWS & MEDIA
CONTENT CREATION

SMART HOME VOICE
INTERFACES

TEXT ANALYTICS

WHAT WE DEFINE AS “AI” IN THIS REPORT:

- This report contains an analysis of **over 1,600** private companies found using various keywords related to artificial intelligence technologies in the CB Insights database.
- **Our AI category** includes startups developing industry agnostic AI solutions like advanced vision and language processing systems, as well as startups using predictive algorithms to solve problems in specific industries, like healthcare, cybersecurity, commerce, and finance. The applications range from e-commerce search engines and chatbots for CRM to deep learning-based cybersecurity solutions and machine learning-assisted medical imaging and diagnostics.
- Our funding analysis **excludes** on-demand taxi service, AR/VR and hardware-focused robotics startups (robotics is included as a separate section at the end of this report). It **includes** private companies working on driverless cars as well as robotic software startups. Only **equity funding** rounds and convertible notes are included in funding charts.

AI Equity Funding Since 2012:

\$14.9 BILLION

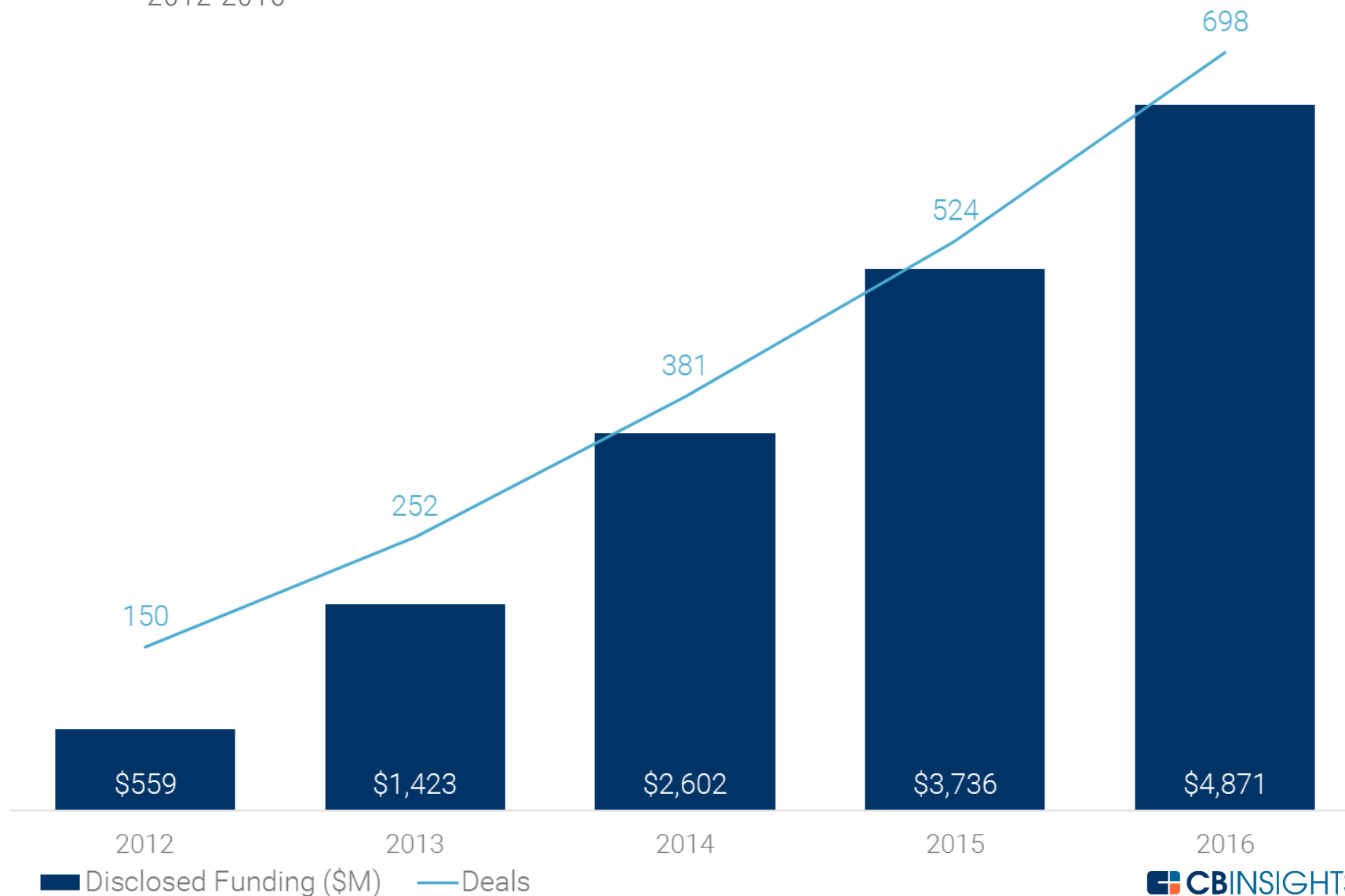
across

2250 DEALS



ARTIFICIAL INTELLIGENCE: ANNUAL FUNDING HISTORY

2012-2016



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DEALS CONTINUE TO BREAK PREVIOUS RECORDS

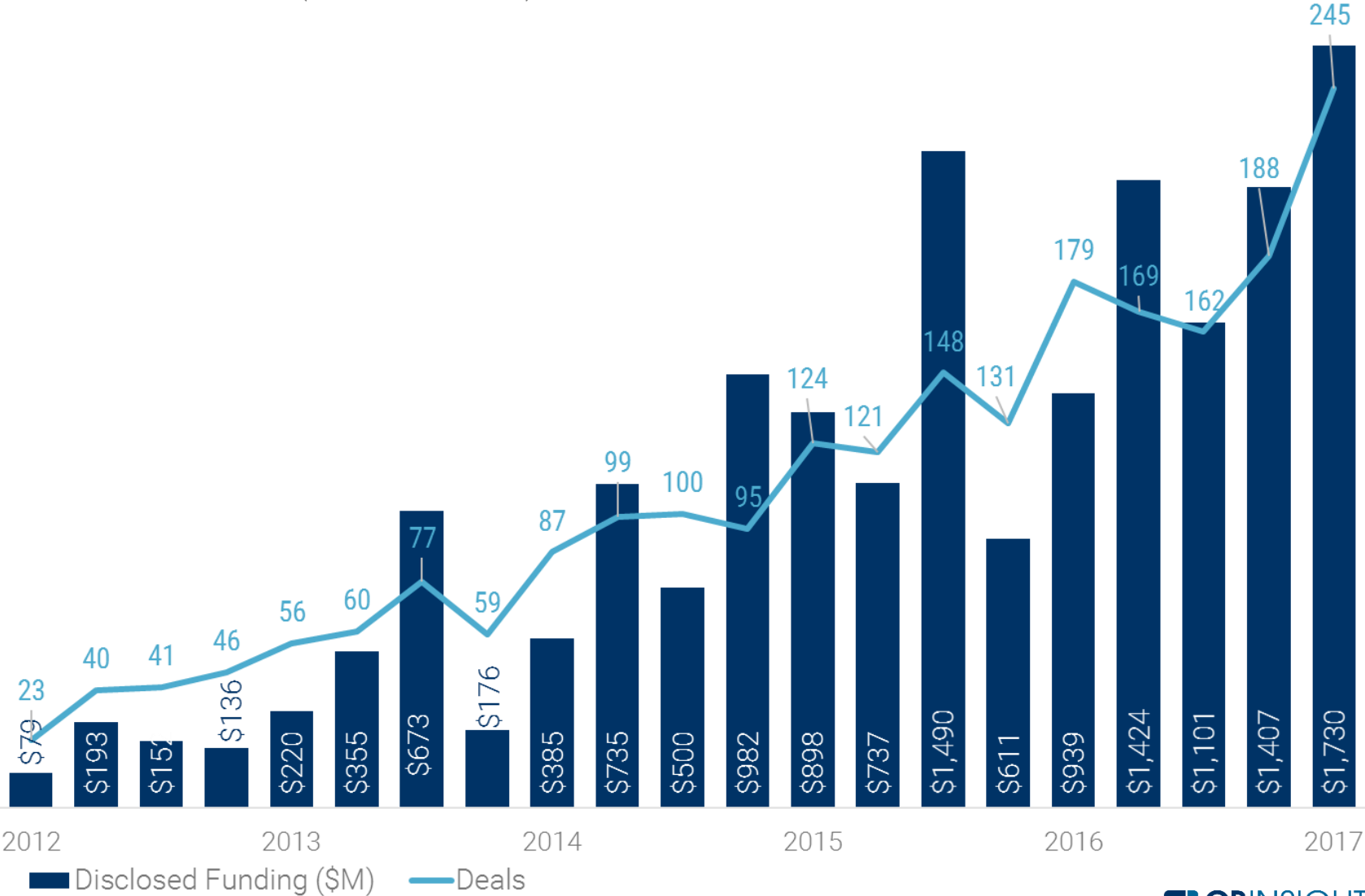
Deals to AI startups increased 4.6x in the last 5 years, from 150 in 2012 to 698 in 2016.

The top rounds in 2016 went to auto tech company Zoox (\$200M Series A) and cybersecurity startup StackPath (\$180M private equity).



ARTIFICIAL INTELLIGENCE: QUARTERLY FUNDING

Q1'12-Q1'17 (as of 3/23/2017)



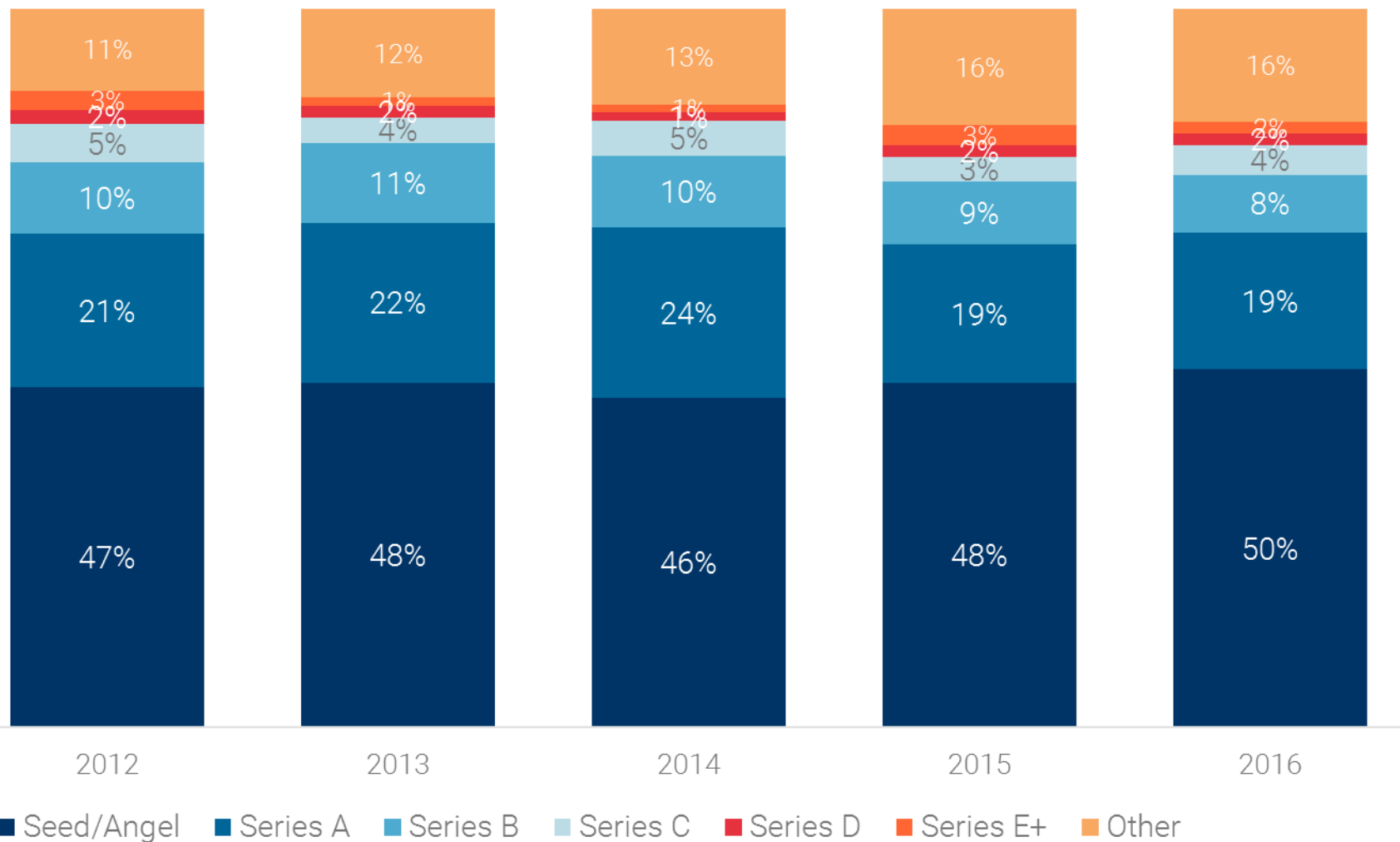
Q1'17 MOST ACTIVE QUARTER FOR AI STARTUPS

Before the close of Q1'17 (as of 3/23/17) AI startups received 245 deals and \$1.7B in funding. Nearly 48% of the deals in Q1'17 were in the seed/angel stage, indicating newer companies are continuing to enter the space.



ARTIFICIAL INTELLIGENCE: GLOBAL DEAL SHARE

2012-2016



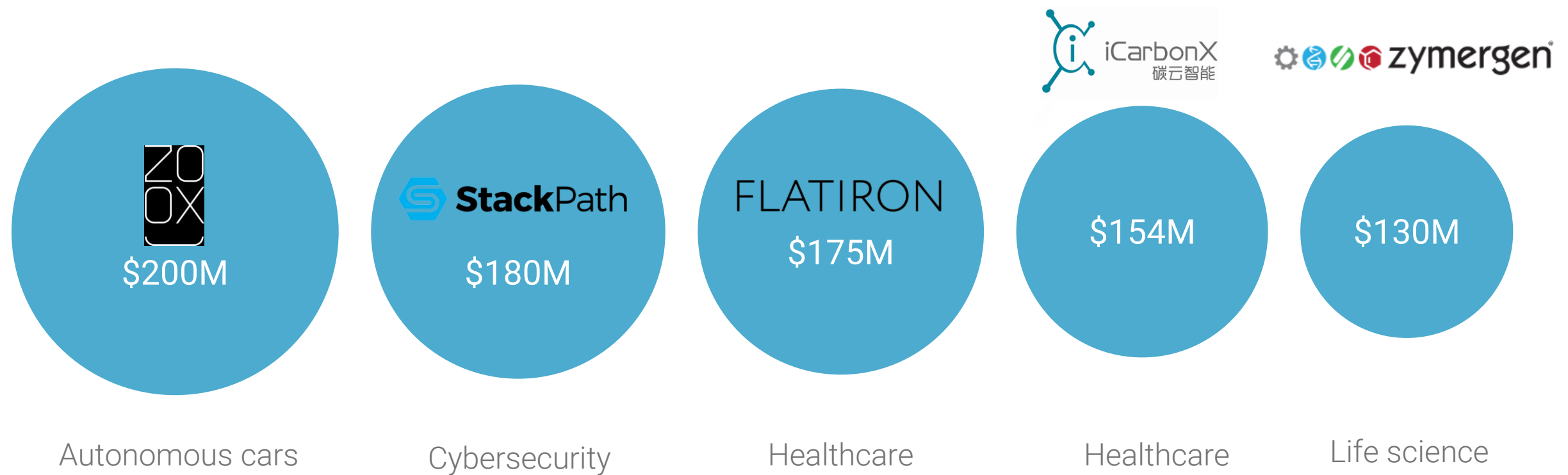
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INDUSTRY STILL NASCENT, SEED DEALS DOMINATE






Early-stage deals dominated across the years, accounting for 67% or more of the total deal share. Mid and late-stage deals have remained fairly constant during this period. Some of the late-stage companies that raised recently include Lattice Engines, SoundHound and NIO.

RECENT \$100M+ MEGA-ROUNDS

2016



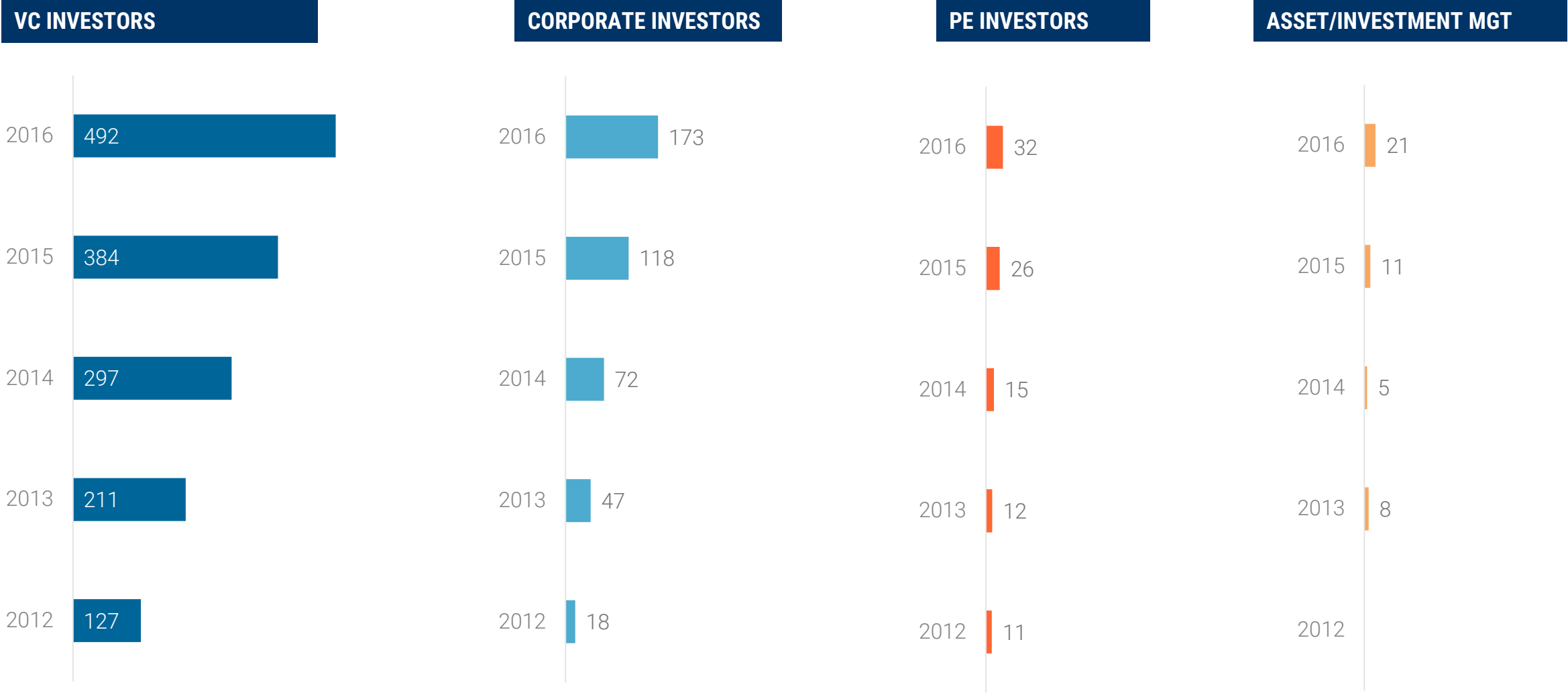
UNICORNS USING AI ALGORITHMS ACROSS INDUSTRIES

UNICORN	AI FOCUS	UNICORN	AI FOCUS
AVANT	Machine learning-based credit risk modeling	 iCarbonX 碳云智能	AI-based health data mining for personalized healthcare
BenevolentAI	Deep learning-based drug discovery	 inside sales.com	Built on the Neuralytics predictive analytics engine for sales insights
 G3 IoT	Platform-as-a-service that facilitates building and deploying machine learning models for predictive analysis of IoT data	UPTAKE	Machine learning solutions and predictive maintenance for industrial IoT
 CYLANCE	Artificial intelligence to predict and prevent cyber attacks		Autonomous vehicles
FLATIRON	Machine learning to extract information from patients' electronic health records		










The map shows the most well-funded startups leveraging artificial intelligence in each of the 35 states where there have been equity deals to the category in the last five years (as of 4/3/2017).



NUMBER OF ACTIVE INVESTORS BY TYPE



TOP VC INVESTORS IN ARTIFICIAL INTELLIGENCE

RANK	INVESTOR	RANK	INVESTOR
1	 Data collective	5	 SVAngel
1	 intel Capital	7	 ACCEL PARTNERS
3	 NEA®	8	 PLUGANDPLAY
4	 khosla ventures	8	 General Catalyst Partners
5	 G/		

CB Insights unveiled the **AI 100**—a list of 100 of the most promising private companies applying artificial intelligence algorithms across industries, from healthcare to auto to fintech—at the Innovation Summit in January 2017.

100 AI STARTUPS YOU BETTER KNOW

CONVERSATIONAL AI/ BOTS



VISION



AUTO



ROBOTICS



CYBERSECURITY



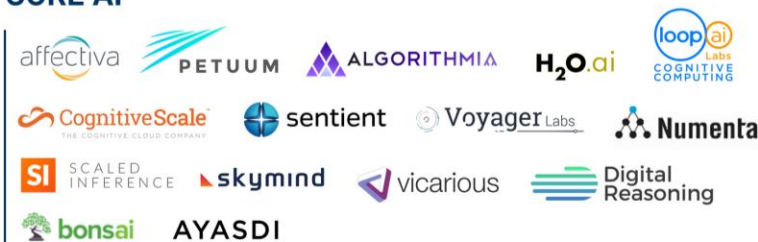
BUSINESS INTELLIGENCE & ANALYTICS



AD, SALES, CRM



CORE AI



HEALTHCARE



TEXT ANALYSIS/ GENERATION



IOT/IIOT



COMMERCE



FINTECH & INSURANCE



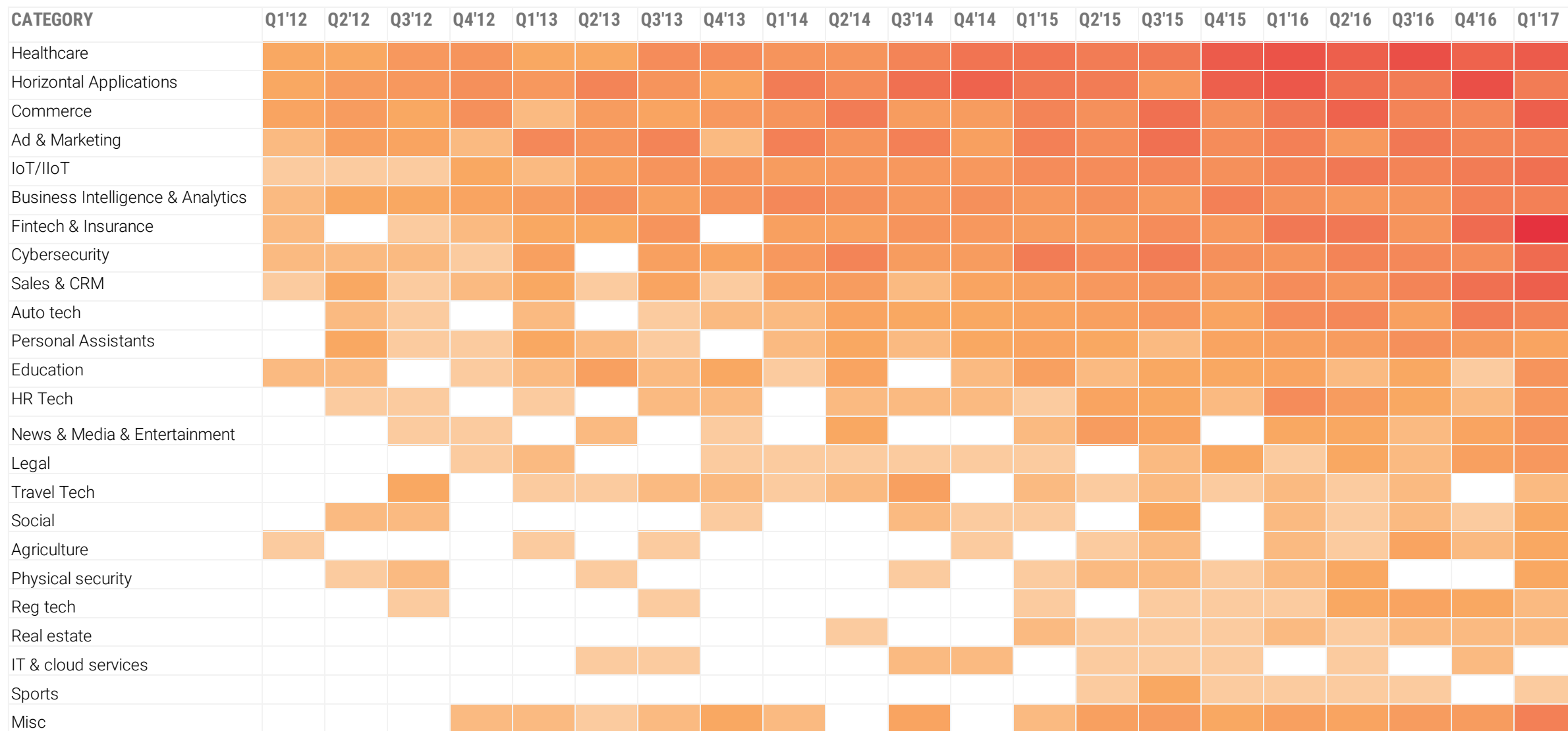
OTHER





AI HEATMAP: DEALS DISTRIBUTION BY CATEGORY

Q1'12-Q1'17 (as of 3/23/17)



Low deal saturation High deal saturation

KEY TAKEAWAYS



HEALTHCARE

Health and wellness is the hottest area of investment in AI, with 270 deals going to the category since 2012.



HORIZONTAL APPLICATIONS

Deals to industry agnostic AI applications have been fluctuating over the years, but accounted for the second highest aggregate deals among the AI categories. Deals reached a 5-year-high of 79 in 2016.



FINTECH & INSURANCE

AI in fintech and insurance tech is the leading category for deals in 2017 so far, with over 30 deals to the category before the close of Q1'17.



OTHER

Sales & CRM deals nearly doubled in 2016 from the previous year, and is the third highest category for deals so far in Q1'17. The pace of cybersecurity deals picked up in Q1'17 after a slowdown in 2016.

UNDERSTANDING AI AND MACHINE LEARNING


The definitions of what an AI system is and what it's capable of accomplishing have been constantly changing over the years with corresponding changes in technological capabilities. Access to massive amounts of data and advanced processing capabilities have ushered in a new era of AI applications.

Machine learning is a set of algorithms used to make a system “artificially intelligent,” enabling it to recognize patterns from large datasets and apply the findings to new data.

Machine learning can be used to train computers to understand and analyze human language, including text and voice (Natural Language Processing or NLP), to identify and analyze images (image processing and computer vision), or for time series analysis, among other things. **Deep learning algorithms**, a subset of machine learning, uses several layers of neural networks (processes that mimic the human brain).



SPOTLIGHT: AI IN HEALTHCARE, COMMERCE, AD & MARKETING, IOT



Companies leveraging machine learning algorithms to reduce drug discovery times, provide virtual assistance to patients, and improve the accuracy of medical imaging and diagnostic procedures, among other things.

**HEALTHCARE &
WELLNESS**

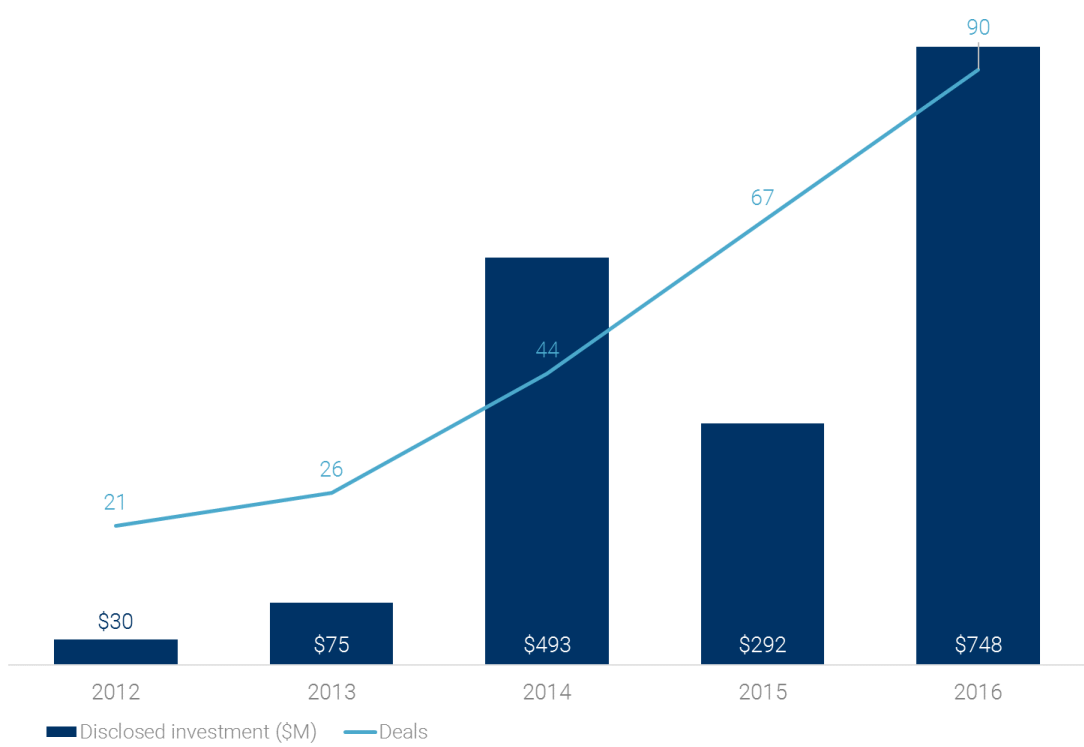
COMMERCE

AD & MARKETING

IOT/IIOT

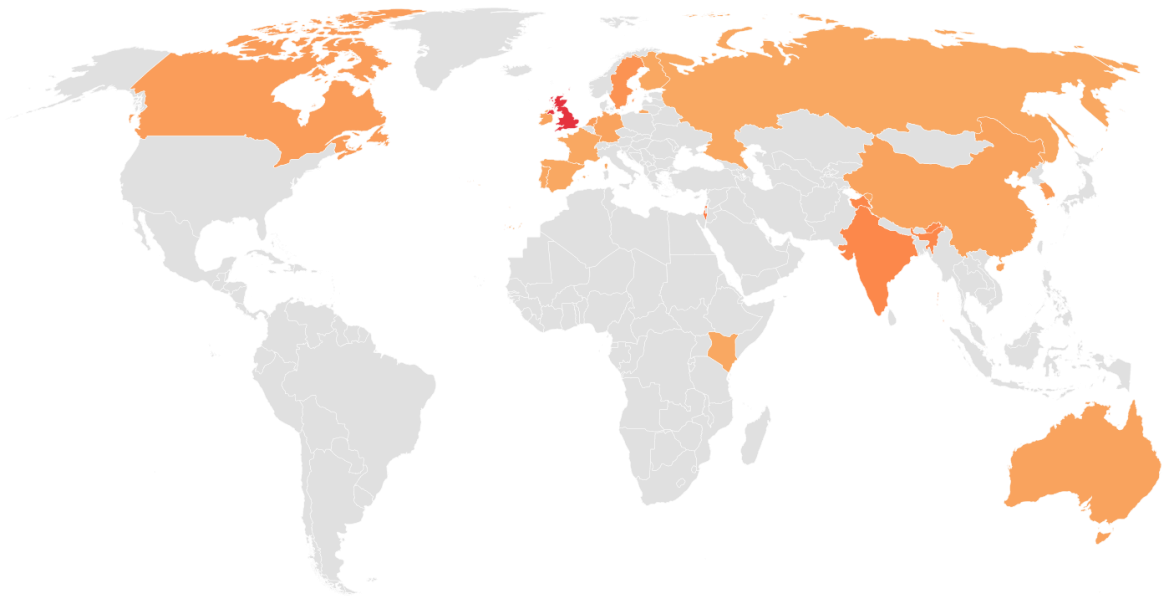
AI IN HEALTHCARE & WELLNESS

ANNUAL FUNDING HISTORY



Healthcare and wellness received the highest aggregate deals since 2012 compared to other AI categories. Deals and funding hit a 5-year-high in 2016. The top rounds last year went to unicorn companies Flatiron Health (\$175M Series C) and iCarbonX (\$154M Series A). So far this year, as of 3/22/17, healthcare & wellness startups have raised over \$130M across 22 deals, including a \$65M Series A round raised by cancer diagnosis startup Freenome.

DEALS OUTSIDE THE UNITED STATES



NON-US DEAL SHARE = 27%







73% of the deals since 2012 went to US startups, followed by United Kingdom (9.2%) and Israel (3.7%). However, the share of non-US deals reached a five-year-high in 2016 at 35%, compared 24% or less in previous years. So far this year, over 45% of the deals have gone to startups outside the United States, to countries including the United Kingdom, India, Netherlands, Finland, and Israel.



106 AI STARTUPS TRANSFORMING HEALTHCARE

Imaging & diagnostics is the most crowded area in healthcare AI, with 19 out of the 24 startups in the map raising their first equity funding round since January 2015.

The map also includes horizontal AI startups like Ayasdi and H2O.ai (bottom left) which have made healthcare one of their focus areas.

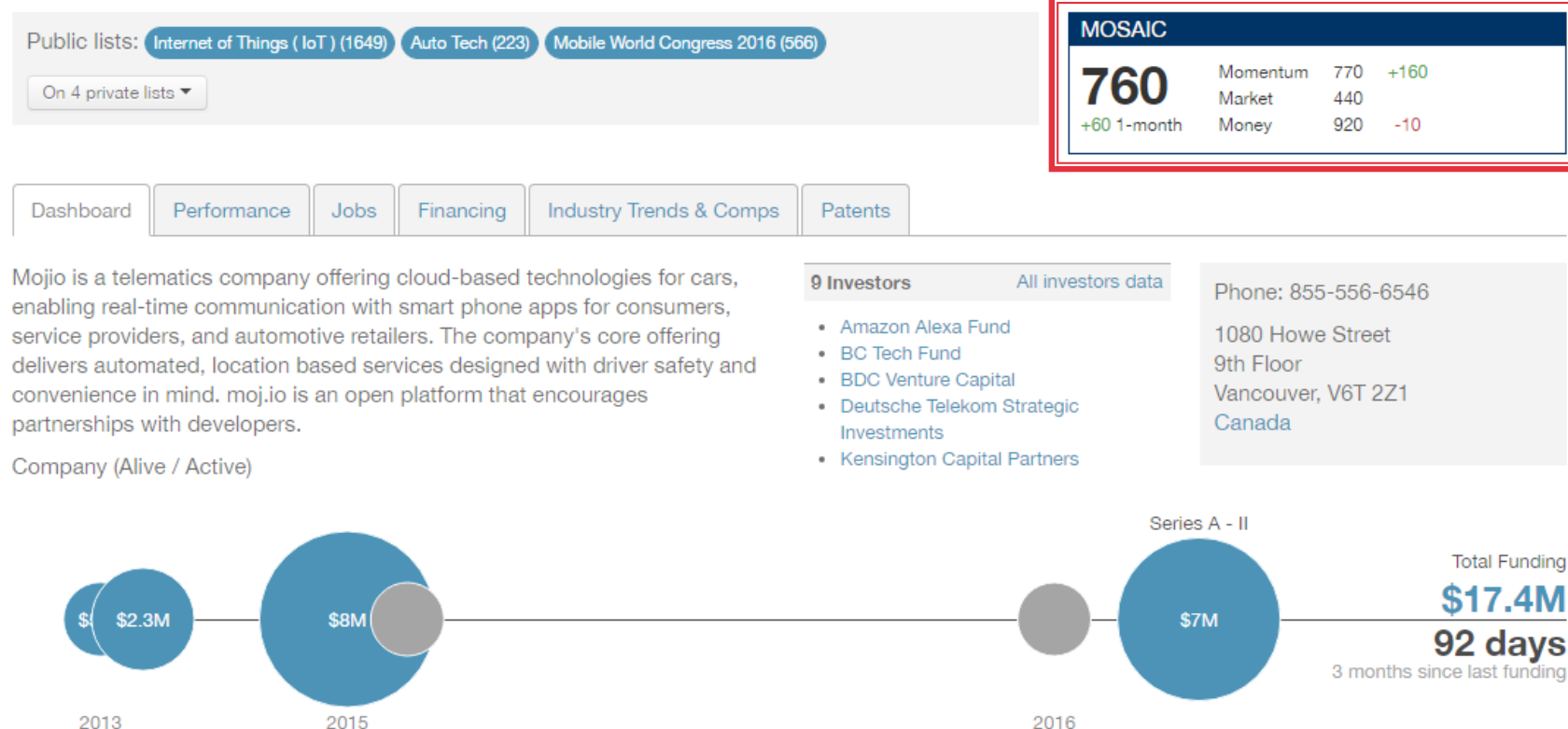
RANK	INVESTOR	SELECT INVESTMENTS
1	 Data Collective	Freenome, Atomwise, CloudMedX, Bay Labs, Enlitic, Recursion Pharmaceuticals
2	 khosla ventures	Zebra Medical Vision, Atomwise, Bay Labs, Lumiata, Ginger.io
3	 flare capital partners	HealthReveal, Predilytics, WellTok, Explorys
3	 FOUNDERS FUND	Teckro, Medal, Freenome, Elemental Machines
3	 G/	Freenome, Zephyr Health, Flatiron Health, Predilytics
6	 GE VENTURES	HealthReveal, Arterys, MedAware

TOP INVESTORS IN HEALTHCARE AI STARTUPS

2012-2017
(as of 3/23/17)

- **Momentum** – Uses signals ranging from hiring growth, exec turnover, news volume and sentiment, customer & partner signings, product development velocity, web traffic, mobile app data, and social media chatter.
- **Market** – Uses Market Mosaic to assess health of industry the company competes in.
- **Money** – Financial strength and viability of company based on burn rate, financing history, and investor quality.

Mojio moj.io








IDENTIFYING HIGH-MOMENTUM STARTUPS USING MOSAIC

Mosaic is a quantitative framework to algorithmically measure the overall health and growth potential of private companies.

Companies are scored on a 0 to 1000 scale, based on the 3 M's described here.

EARLY-STAGE COMPANIES TO WATCH

COMPANY	MOSAIC (OUT OF 1000)	LAST ROUND/ DATE	SELECT INVESTORS	AREA OF FOCUS
	890	\$65M/ Series A Mar'17	Allen & Company, AME Cloud Ventures, Andreessen Horowitz, CRV, Data Collective, Founders Fund, Google Ventures	Cancer diagnostics
	810	\$8.5M/ Series A Jan'17	Ignition Partners, Mindset Ventures, Osage University Partners	Predictive risk analytics
	760	\$10.8M/ Series A Feb'17	Flare Capital Partners, GE Ventures, Greycroft Partners, Manatt Venture Fund	Early detection of chronic diseases
	760	\$5.3M/ Series A Dec'16	Data Collective, Eleven Two Capital, Khosla Ventures, National Science Foundation, Yann LeCun	Medical imaging
	670	\$2.5M/ Series A Aug'16	Omidyar Network, Union Square Ventures	Cognitive therapy/ mental health



Companies leveraging AI algorithms for visual search, natural language processing, shopper behavioral analytics, and in-store analytics, among other things.

HEALTHCARE &
WELLNESS

COMMERCE

AD & MARKETING

IOT/IIOT



“If you don’t have an AI strategy, you are going to die in the world that’s coming.”

Devin Wenig

CEO, eBay

RETAIL AI IN THE NEWS

GOOGLE HOME WORKS WITH EBAY'S
SHOPBOT TO PRICE YOUR STUFF

March 9, 2017

engadget

AMAZON UNVEILS SMART
CONVENIENCE STORE SANS CHECK-
OUTS, CASHIERS

December 12, 2016

The Seattle Times

ETSY PAID \$32.5 MILLION FOR AI
STARTUP BLACKBIRD TECHNOLOGIES

November 11, 2016

VentureBeat

TITAN TAPS IBM WATSON TO DRIVE
SALES

March 22, 2017

Business Standard

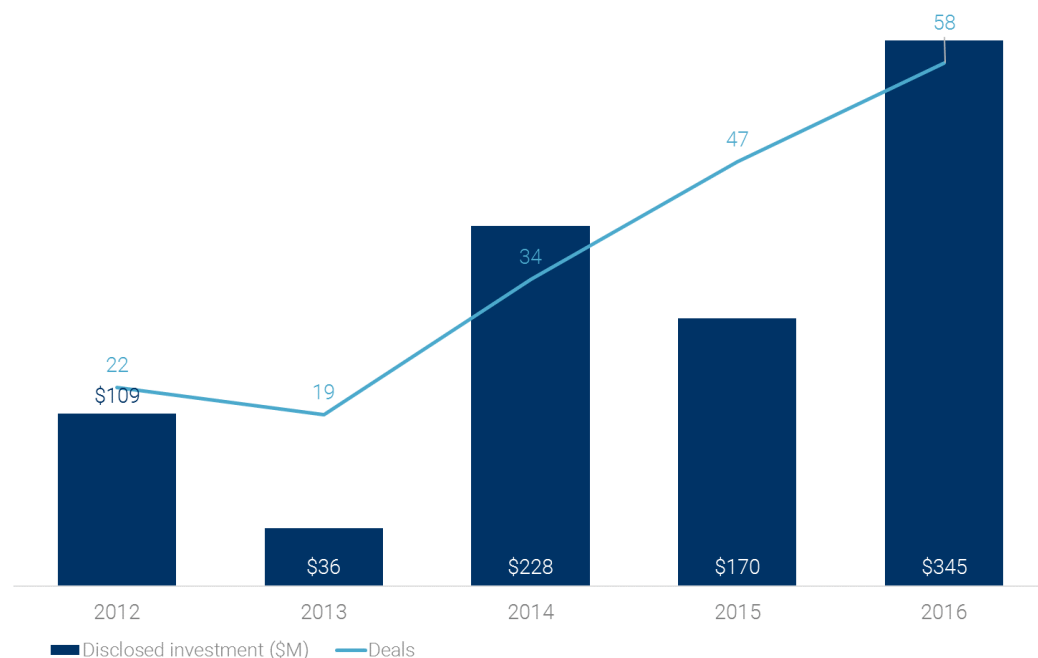
MACY'S TEAMS WITH IBM WATSON FOR AI-
POWERED MOBILE SHOPPING ASSISTANT

July 20, 2016

Forbes

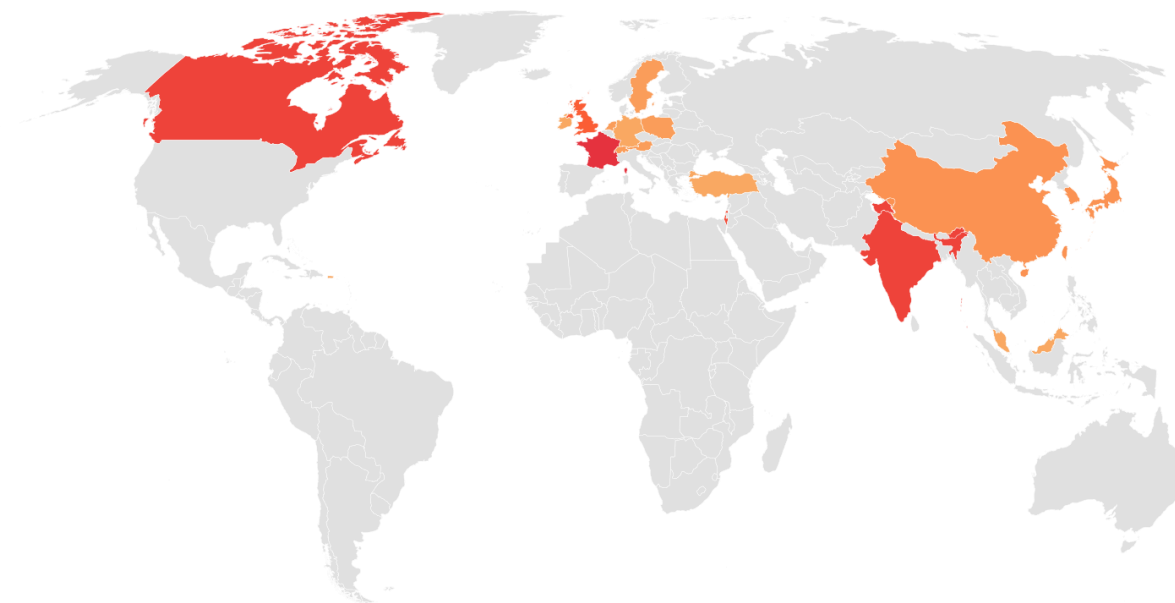
AI IN COMMERCE

ANNUAL FUNDING HISTORY



Nearly 200 deals went to startups in this category from 2012-16. Deals and funding reached a 5-year-high in 2016, with the top rounds going to California-based BloomReach (\$56M Series D round) and Singapore-based Trax Image Recognition (\$40M Series C round). So far in 2017, startups have raised over \$100M across 21 deals. The top round in Q1'17 was a \$20M Series D round to previously-mentioned Trax Image Recognition.

DEALS OUTSIDE THE UNITED STATES



NON US DEAL SHARE = 42%

Around 42% of the deals have gone to commerce startups outside the United States since 2012. Startups in France accounted for 6.5% of the deal share, followed by Canada (5.5%) and India (5.5%). So far in Q1'17, more than half the deals have gone to countries including South Korea, Singapore, France, United Kingdom, Canada, Israel, Poland and The Netherlands.

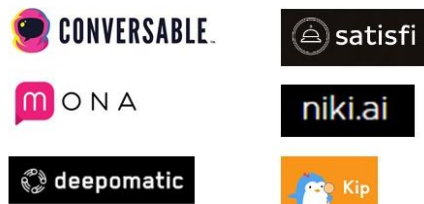
REAL-TIME PRODUCT TARGETING



VISUAL SEARCH



CONVERSATIONAL COMMERCE



SIZING & STYLING



INTEGRATED ONLINE & IN-STORE ANALYTICS



REAL-TIME PRICING & INCENTIVES



LOCATION-BASED MARKETING & ANALYTICS



NATURAL LANGUAGE SEARCH



IN-STORE VISUAL MONITORING



PREDICTIVE MERCHANDISING



MULTICHANNEL MARKETING



40+ AI STARTUPS TARGETING RETAIL IN ONE INFOGRAPHIC

The area is emerging, and most companies on the map remain in the early stages of funding.

TOP VC INVESTORS IN AI COMMERCE STARTUPS

2012-2017 YTD
(as of 3/23/17)

RANK	INVESTOR	SELECT INVESTMENTS
1	NORWEST VENTURE PARTNERS	Modsy, Personali, InsightsOne
1	BV Battery Ventures	Reflektion, SmarterHQ, BloomReach
1	Alven capital	Deepomatic, Tinyclues, AntVoice
1	intel Capital	COSY, Emotient, Reflektion

EARLY-STAGE COMPANIES TO WATCH

COMPANY	MOSAIC (OUT OF 1000)	LAST ROUND/ DATE	SELECT INVESTORS	AREA OF FOCUS
	840	\$16M/ Series A Mar'17	Index Ventures, ISAI, Mosaic Ventures	Geo-location targeting for retailers
	720	\$0.44M/ Seed Dec'16	Unilazer Ventures	Chatbot SDK for commerce
	710	Undisclosed/ Series A Aug'16	Sequoia Capital India, Exfinity Venture Partners, Growx Ventures Management	Apparel and fashion
 INTELLIGENT VISION	710	\$1.74M/ Series A Sep'16	Robert Bosch Venture Capital, Spintop Ventures	In-store analytics and shopper behavior
	610	\$5.3M/ Series A-II May'16	Alibaba Group, Naspers, State of Mind Ventures, YJ Capital	E-commerce search engine



HEALTHCARE &
WELLNESS

COMMERCE

Companies leveraging AI algorithms for cross-platform advertising, intelligent e-mail marketing, and content-aware video advertising, among other things.

AD & MARKETING

IOT/IIOT

'1:1 MARKETING' WITH AI



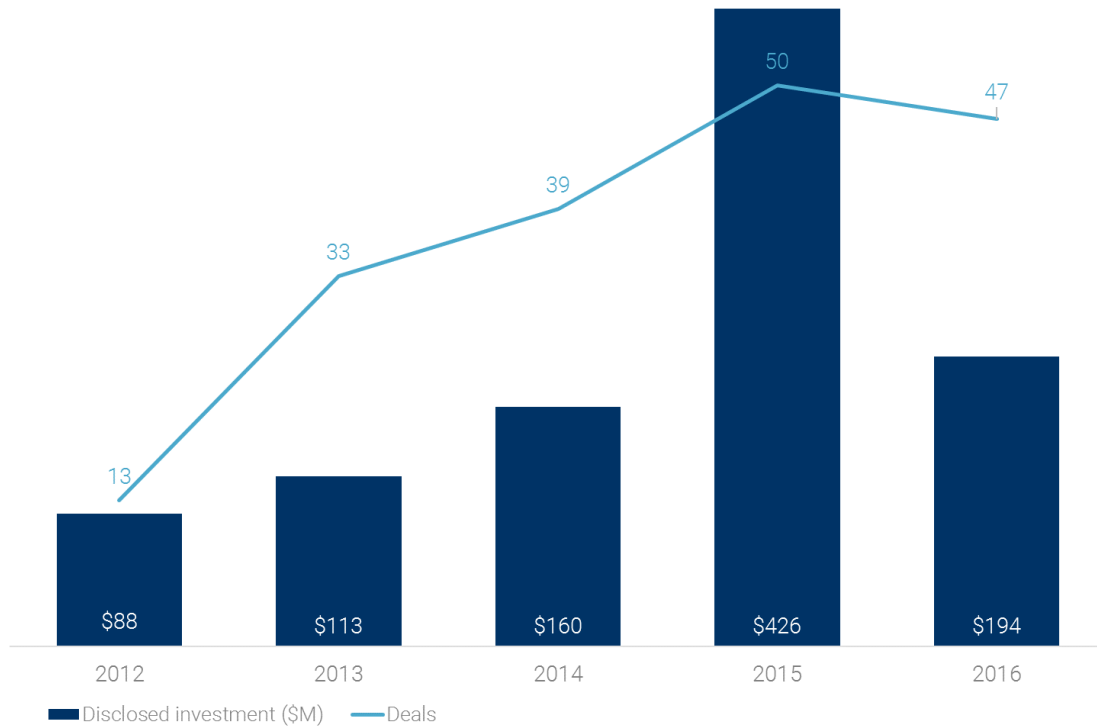
“Specifically, predictive marketers will leverage AI computing power to process immense amounts of data to inform marketing campaigns so they can create unique and customize experiences at the individual level in near real time--**finally delivering on the promise of 1:1 marketing that we have been talking about for 20 years.**”

Randy Wootton

CEO, Rocket Fuel

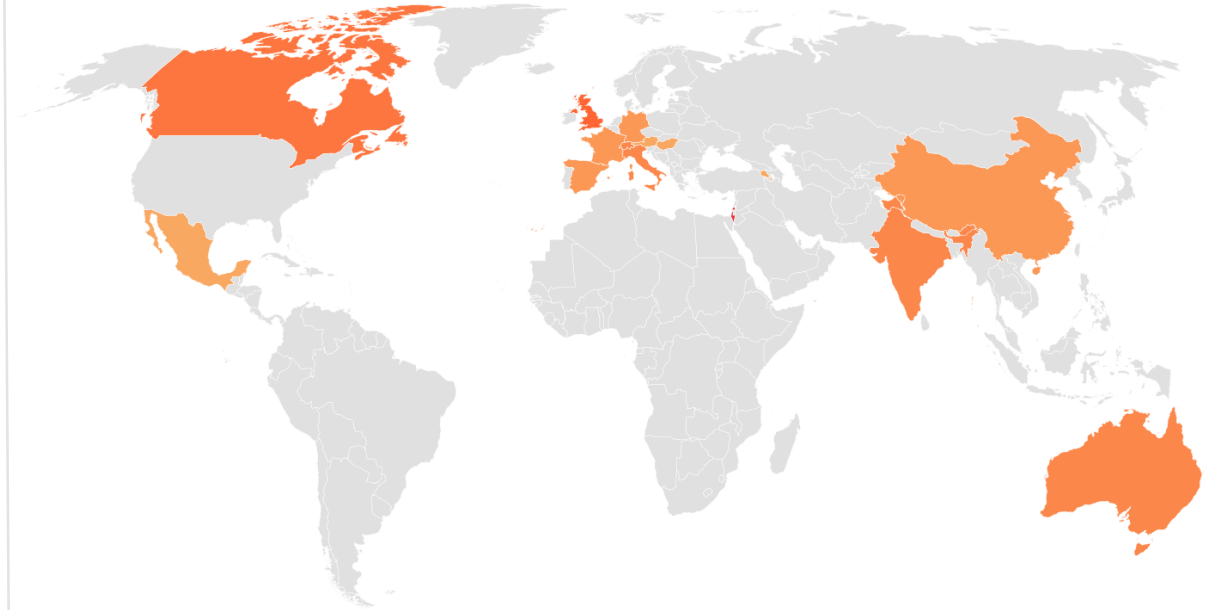
AI IN ADVERTISING & MARKETING

ANNUAL FUNDING HISTORY



Deals to advertising and marketing startups using artificial intelligence algorithms peaked in 2015 at 50, before dropping slightly to 47 in 2016. The top rounds last year were raised by Datorama (\$32M Series C) and Persado (\$30M Series C). So far in Q1'17, as of 3/21/17, investors poured in \$11.5M across 12 deals, including 6 seed rounds to startups like Uru (video advertising) and Ematic Solutions (e-mail marketing).

DEALS OUTSIDE THE UNITED STATES






NON U.S. DEAL SHARE = 24%





Startups in the United States accounted for over 90% of the deals in 2012. But the numbers fluctuated in the following years, before dropping to 68% in 2015, and increasing slightly to 73% in 2016. Overall, 4.7% of the deals went to startups in Israel, followed by United Kingdom (2.6%) and Singapore (2.1%).

TOP INVESTORS IN AI COMMERCE STARTUPS

2012-2017
(as of 3/23/17)

RANK	INVESTOR	SELECT INVESTMENTS
1		SalesPredict, Totango, Taboola
1		TVision Insights, nToggle, BlueConic
1		TapFwd, Ematic Solutions, Sentisis

EARLY-STAGE COMPANIES TO WATCH

COMPANY	MOSAIC (OUT OF 1000)	LAST ROUND/ DATE	SELECT INVESTORS	AREA OF FOCUS
 OCTANE AI	810	\$1.5M / Seed Nov'16	Boost VC, Dimension 6, General Catalyst	Building an audience using messenger bots
 ematic	770	\$2.4M/ Seed Mar'17	Convergence Ventures, MDI Ventures, Walden International, Wavemaker Partners	E-mail marketing
 Amplero	740	\$8M/ Series A July'16	Salesforce Ventures, Seven Peaks Ventures, Trilogy Equity Partners, Wildcat Venture Partners	ML-based marketing solutions to reduce churn and increase ROI
 AUTOMAT	670	Undisclosed/ Seed Jul'16	O'Reilly AlphaTech Ventures, Real Ventures, Relay Ventures, Slack Fund	Chatbots for 1:1 conversations

The background of the slide features a blue-tinted image of a city skyline, likely Dubai, with prominent skyscrapers. Overlaid on this image is a white network diagram consisting of numerous nodes connected by lines, symbolizing connectivity and data flow.

HEALTHCARE &
WELLNESS

COMMERCE

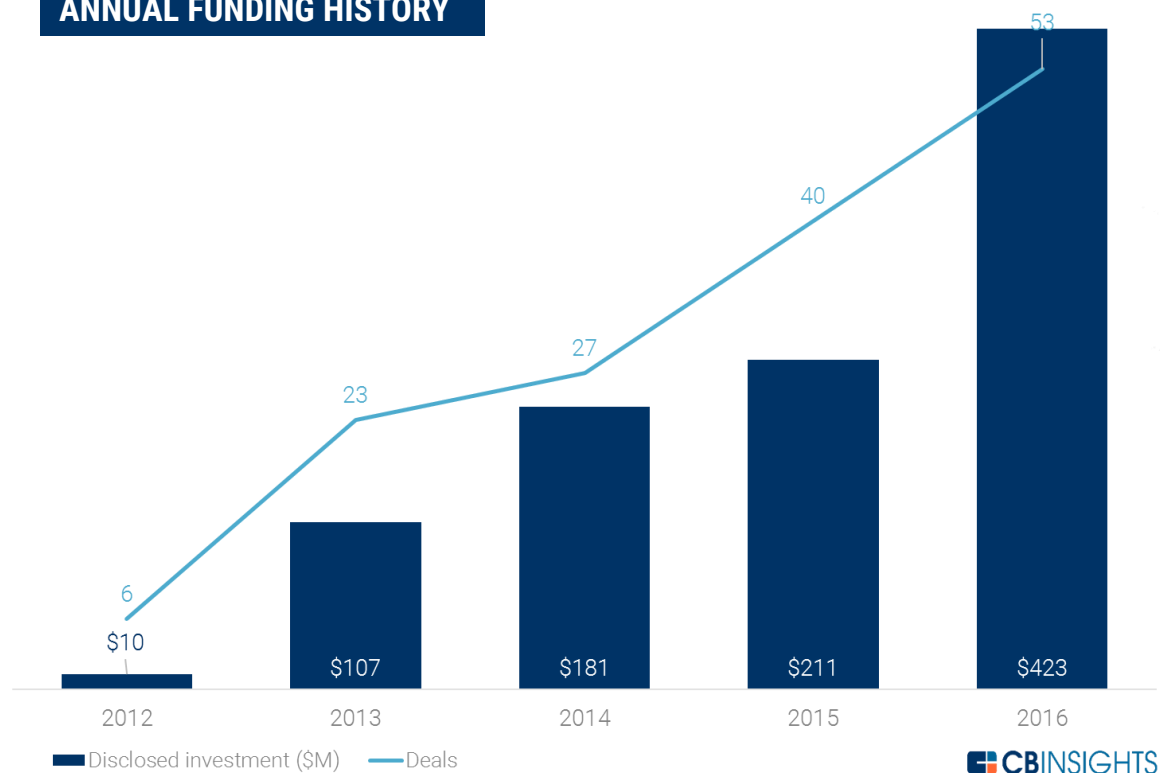
AD & MARKETING

Companies leveraging AI algorithms for predictive maintenance using industrial IoT data, wearable computing, and voice platforms for connected devices, among other things .

IOT/IIOT

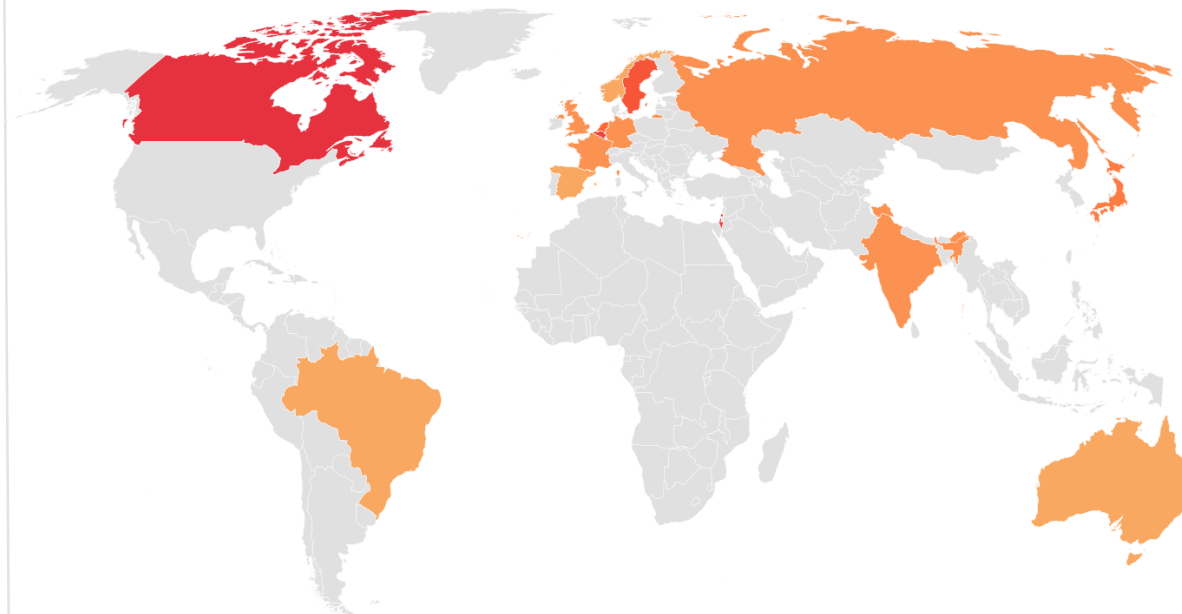
AI IN IOT & INDUSTRIAL IOT

ANNUAL FUNDING HISTORY



Funding to AI in IoT and industrial IoT doubled in 2016 to \$423M from \$211 the previous year. The top round was a \$100M private equity round raised by IIoT startup Stem (focused on the energy industry), followed by a \$70M Series D round raised by C3 IoT. Deals to the AI-IoT space grew 9x, from 6 in 2012 to 53 in 2016.

DEALS OUTSIDE THE UNITED STATES





NON U.S. DEAL SHARE = 26.5%





73% of the deals in the last years went to startups in the United States But US deal share have bene dropping over the years, from 83% in 2012 to 69% in 2016. In Q1'17, deals have gone to countries including Sweden, Australia, France, and India.

TOP INVESTORS IN AI COMMERCE STARTUPS

2012-2017 YTD
(as of 3/23/17)

RANK	INVESTOR	SELECT INVESTMENTS
1	 GE VENTURES	PingThings, Foghorn Systems, Sight Machine, Bit Stew Systems, MAANA, Stem, Predixion Software
2	FROST	AdaptiveWell Technologies, PingThings, OspreyData, MAANA, Predixion Software
3	 TECHNOLOGY VENTURES	Sense Labs, MAANA, Veros Systems

EARLY-STAGE COMPANIES TO WATCH

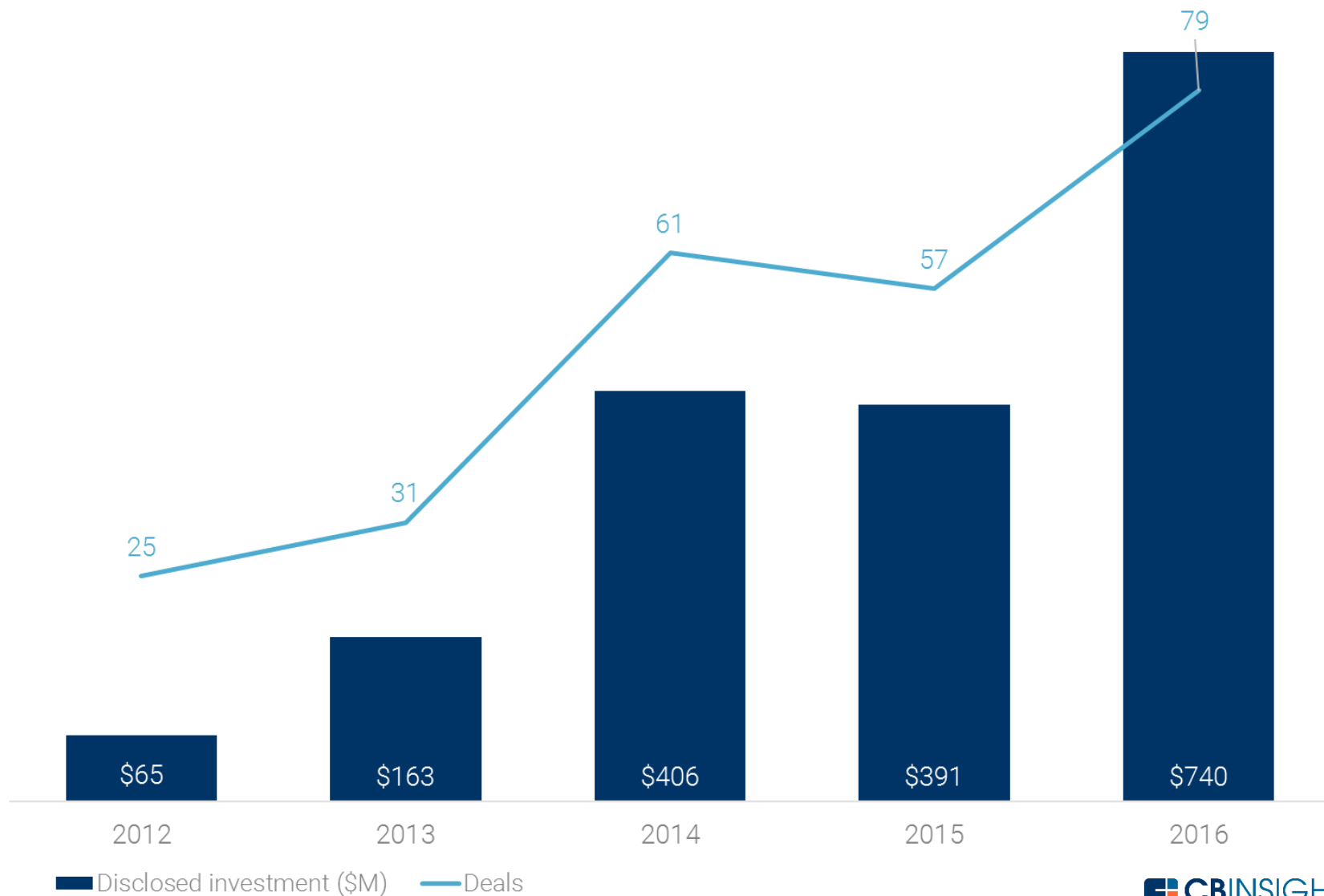
COMPANY	MOSAIC (OUT OF 1000)	LAST ROUND/ DATE	SELECT INVESTORS	AREA OF FOCUS
 NEURA	800	\$11M/ Series B Jan'16	AXA Strategic Ventures, Lenovo Group, Liberty Media Corporation, Pitango Venture Capital	Personalization platform for IoT devices
 netradyne	770	\$16M/ Series A June'16	Reliance Industries	Analytics and insights for fleet management
 KAYRROS	750	\$9.54M/ Series A Jan'17	Index Ventures	Predictive analytics for oil & gas industry
 nanit	730	\$6.6M/ Series A June'16	645 Ventures, AME Cloud Ventures, Flextronics International, Jacobs Technion-Cornell Institute, Lead Edge Capital, RRE Ventures, Upfront Ventures	Baby monitor

HORIZONTAL APPLICATIONS



AI HORIZONTAL APPLICATIONS: FUNDING HISTORY

2012-2016



INDUSTRY AGNOSTIC APPLICATIONS GAIN MOMENTUM IN 2016

Deals to startups developing AI solutions for different verticals dropped in 2015, but made a come back in 2016.

The top round last year was a \$120M Series B round raised by Beijing-based computer vision startup SenseTime.

Horizontal AI: 2015-16 Startup Landscape

TEXT ANALYTICS/ SEARCH ENGINE



VISION



CONVERSATIONAL AI/ BOT PLATFORMS



OTHER



A blue-tinted background image featuring the Star Wars droids R2-D2 and BB-8. R2-D2 is on the left, standing upright, and BB-8 is on the right, rolling. The image is partially obscured by a dark blue vertical bar on the right side.

ROBOTICS: HARDWARE MEETS AI SOFTWARE



“Robots are not going to replace humans, **they are going to make their jobs much more humane.** Difficult, demeaning, demanding, dangerous, dull – these are the jobs robots will be taking.”

Sabine Hauert

Co-founder, Robohub.org



Robotics Funding Since 2012:

\$3 BILLION

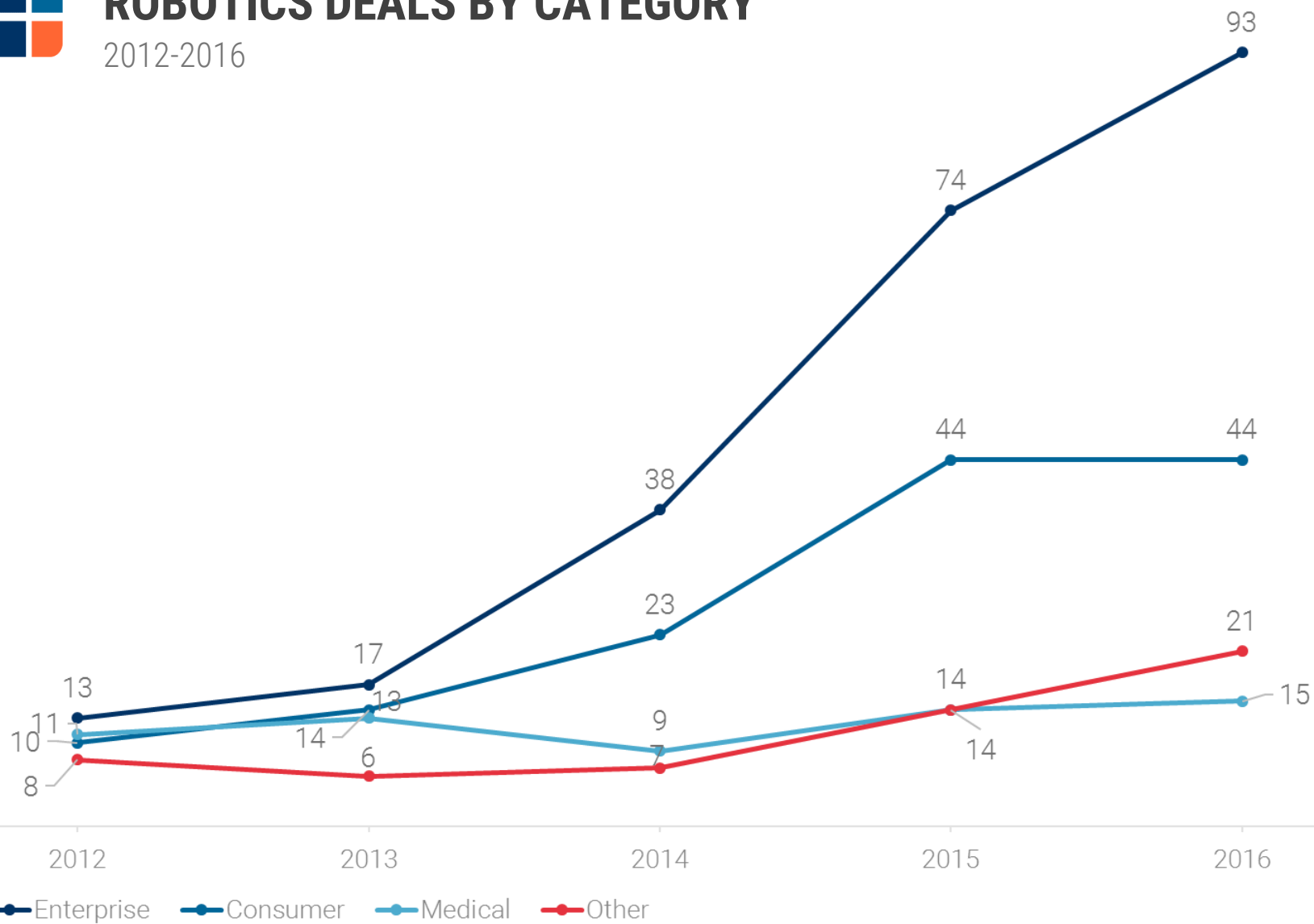
across

488 DEALS



ROBOTICS DEALS BY CATEGORY

2012-2016



CBINSIGHTS

INTEREST SOARS IN ENTERPRISE ROBOTS

Much of deal growth in robotics was driven by the enterprise robotics sector, which saw 74 deals in 2015 – 95% growth from 38 deals the previous year – and 93 deals in 2016. Deals to the consumer robotics sector remained constant at 44 in 2016, after seeing 91% growth in 2015.

DRONES (NON-DELIVERY)



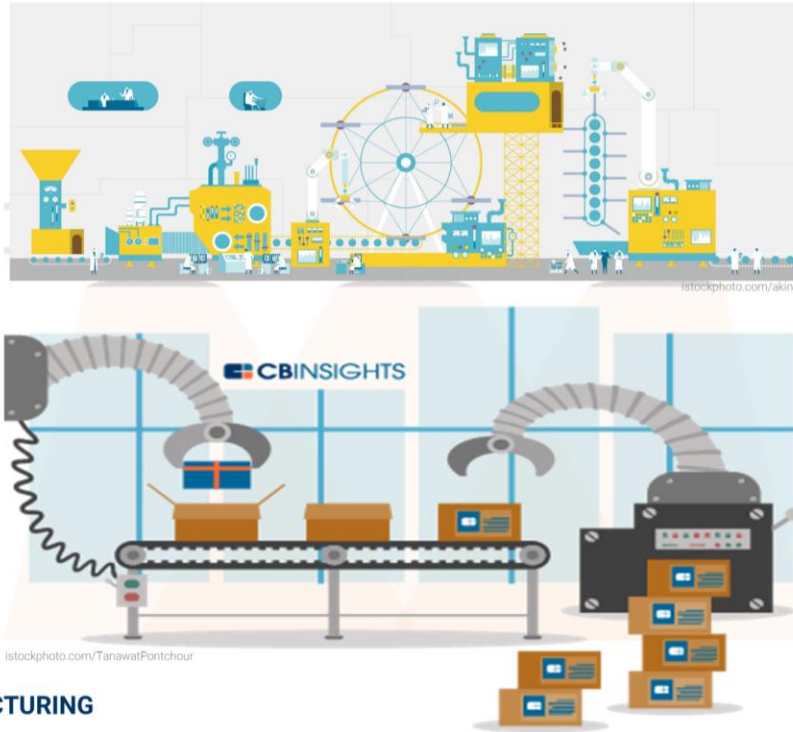
DELIVERY



RESTAURANTS



HEAVY INDUSTRIAL & MANUFACTURING



RETAIL & WAREHOUSE



SERVICE (OTHER)



AUTOMATING THE ENTERPRISE

The startups on the market map are building robots for industrial automation, manufacturing, warehouse automation, and restaurant services, among other tasks.

EDUCATIONAL



SOCIAL



PERSONAL DRONES



SERVICE (OTHER)



DESKTOP ARMS



COOKING/BARTENDING



HOUSEKEEPING



TRANSPORTATION/ LUGGAGE



50+ CONSUMER ROBOTS HELPING TO CLEAN, COOK, AND MORE

The startups on the market map are building robots for industrial automation, manufacturing, warehouse automation, and restaurant services, among other tasks.

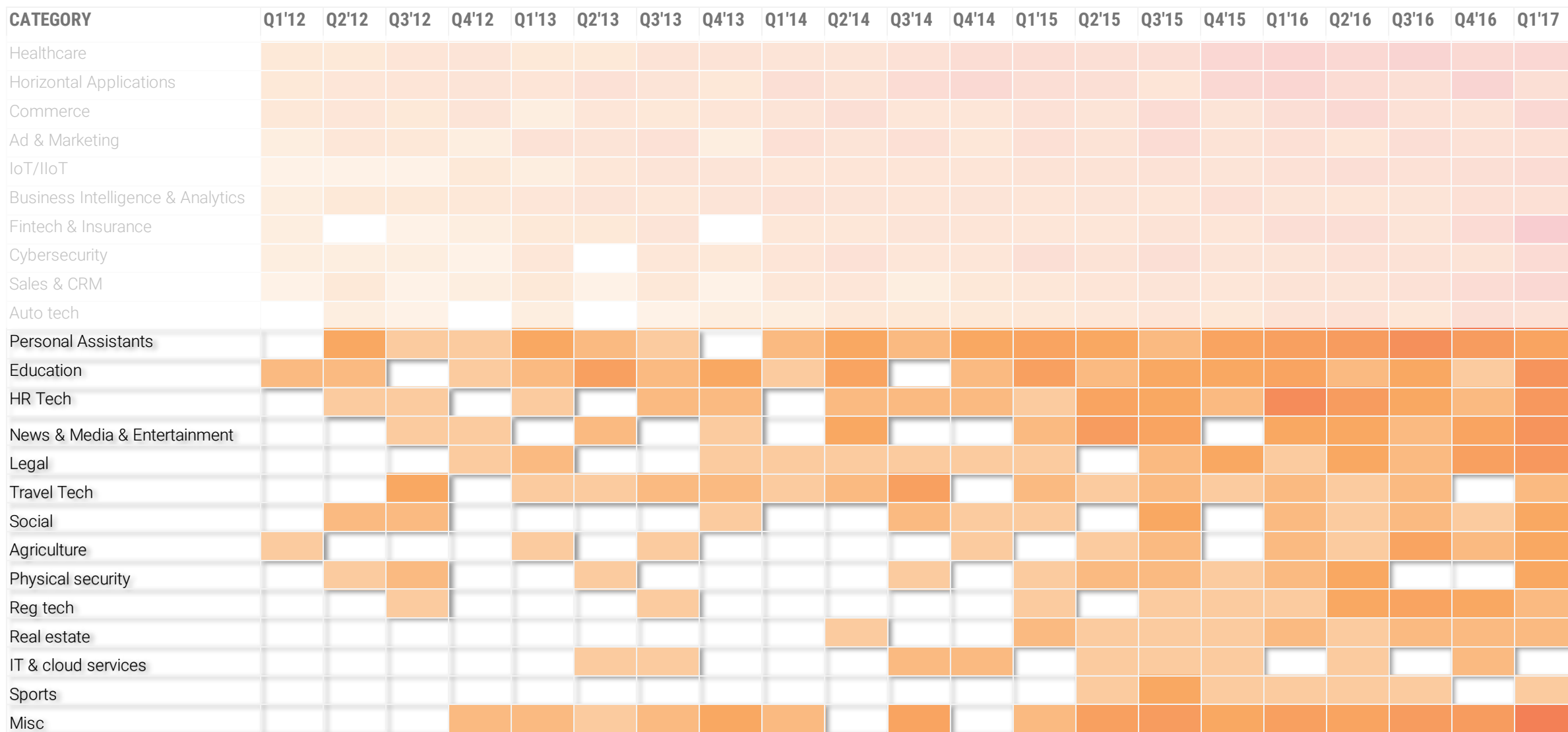


Emerging applications
**GAMING, REG TECH, EXPERT AUTOMATION,
AND MORE**



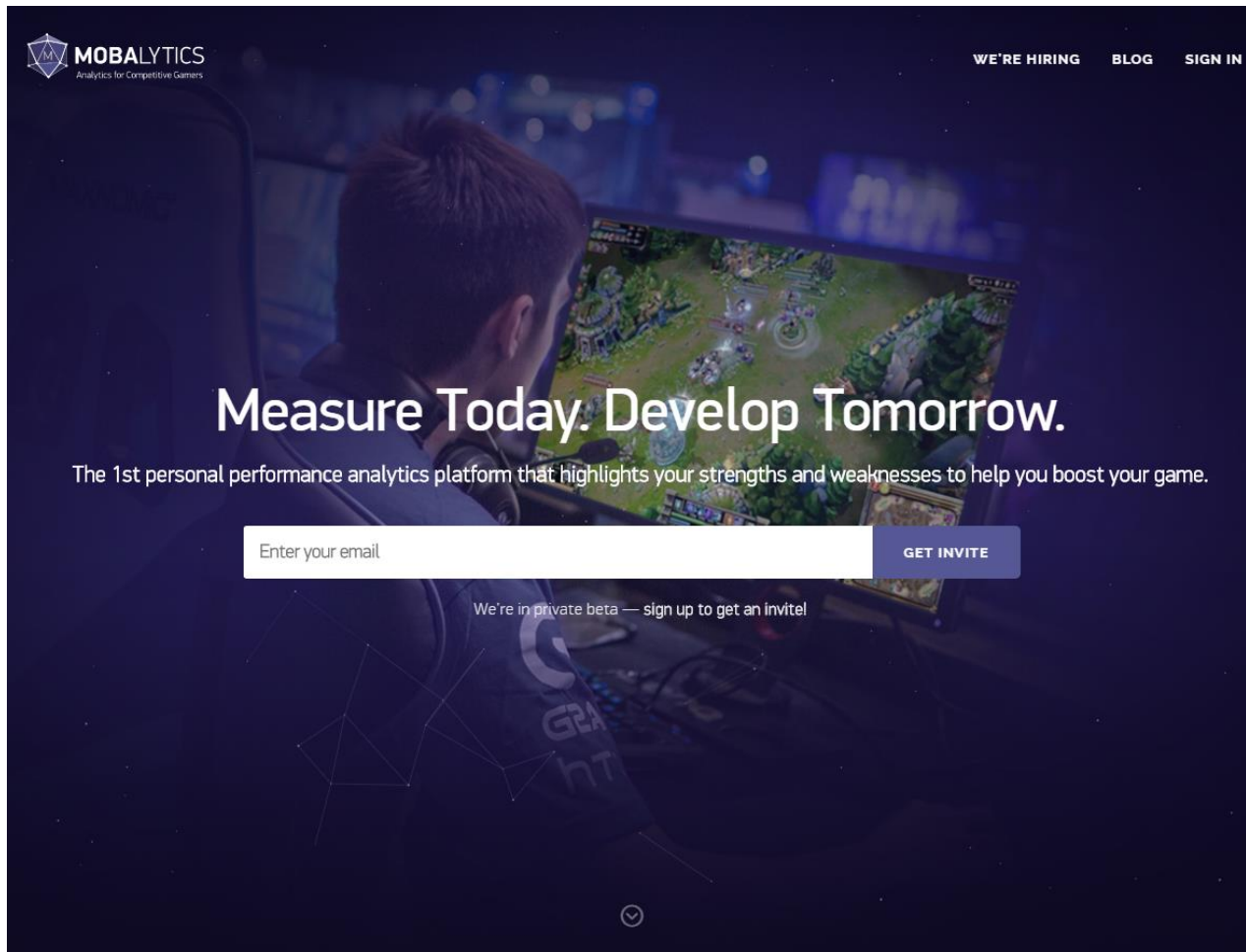
EMERGING AI APPLICATIONS: DEALS DISTRIBUTION BY CATEGORY

Q1'12-Q1'17 (as of 3/23/17)



Low deal saturation High deal saturation

PERFORMANCE ANALYTICS FOR GAMERS



HEATMAP CATEGORY: NEWS, MEDIA & ENTERTAINMENT

Total funding: \$2.65M

Select investors: Almaz Capital Partners, Beta Bridge Ventures, Deep Space Ventures, Founders Fund, General Catalyst, GGV Capital

Performance analytics for gamers in areas like vision, aggression, and teamplay consistency.

AI ASSISTED PAPER GRADING

Q1. Calculus

Q1.1 [3pt] What is the integral of x ?

$$x^2$$

Submission: 11 of 20

1.1: Integral

13 / 20 Graded

TOTAL POINTS

1/3.0 pts

1	0.0	Correct
2	3.0	Blank
3	1.0	Forgot the constant
4	1.0	Forgot 1/2

SUBMISSION SPECIFIC ADJUSTMENTS

Point Adjustment: 0.0

Previous Ungraded Previous



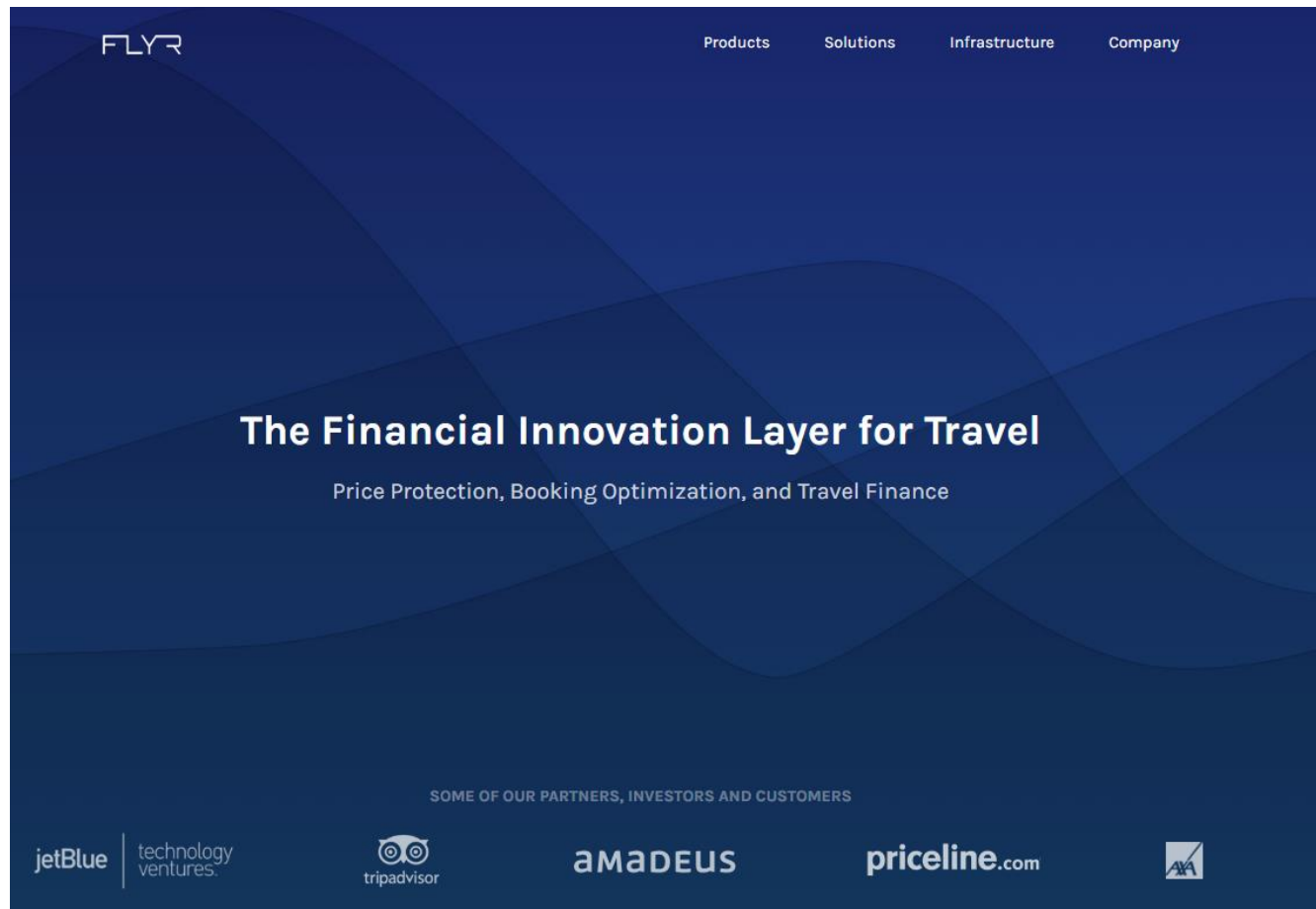
HEATMAP CATEGORY: EDUCATION

Total funding: \$2.6M

Select investors: Bloomberg Beta, Freestyle Capital, K9 Ventures, Reach Capital, The House Fund

Integrating machine learning algorithms that learn from previously graded work to predict how answers should be graded.

TRAVEL SMART: DEMAND FORECASTING



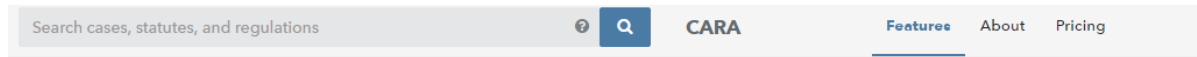
HEATMAP CATEGORY: TRAVEL TECH

Total funding: \$14.3M

Select investors: Amadeus Ventures, AXA Strategic Ventures, Chasm Capital Management, JetBlue Technology Ventures, Plug and Play Ventures, Streamlined Ventures, Thiel Capital, Western Technology Investment

Risk analytics, demand forecasting, and price forecasting, among other solutions for the travel industry.

REDUCING TIME ON LEGAL WORK



Navigate Precedent with Unprecedented Ease.

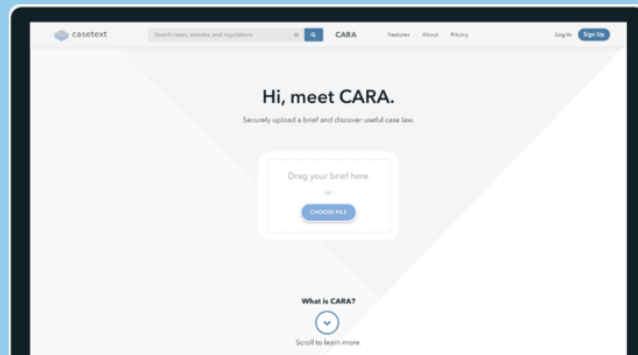
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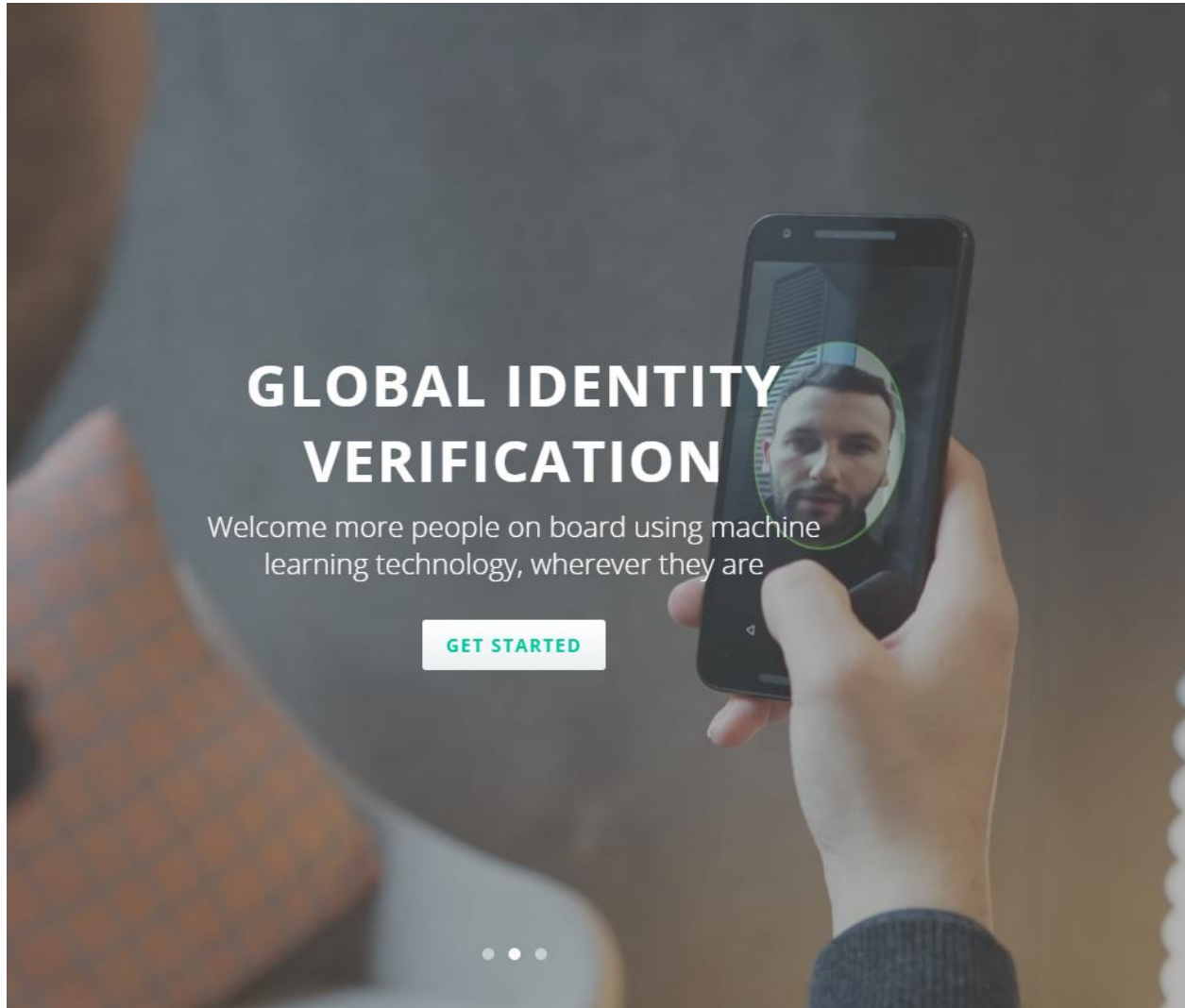
HEATMAP CATEGORY: LEGAL

Total funding: \$24.3M

Select investors: Union Square Ventures, 8VC, Canvas Ventures, Red Sea Ventures, Formation 8

Uses AI and machine learning for advanced legal search and to find case laws related to a particular brief.

REG TECH: IDENTITY VERIFICATION



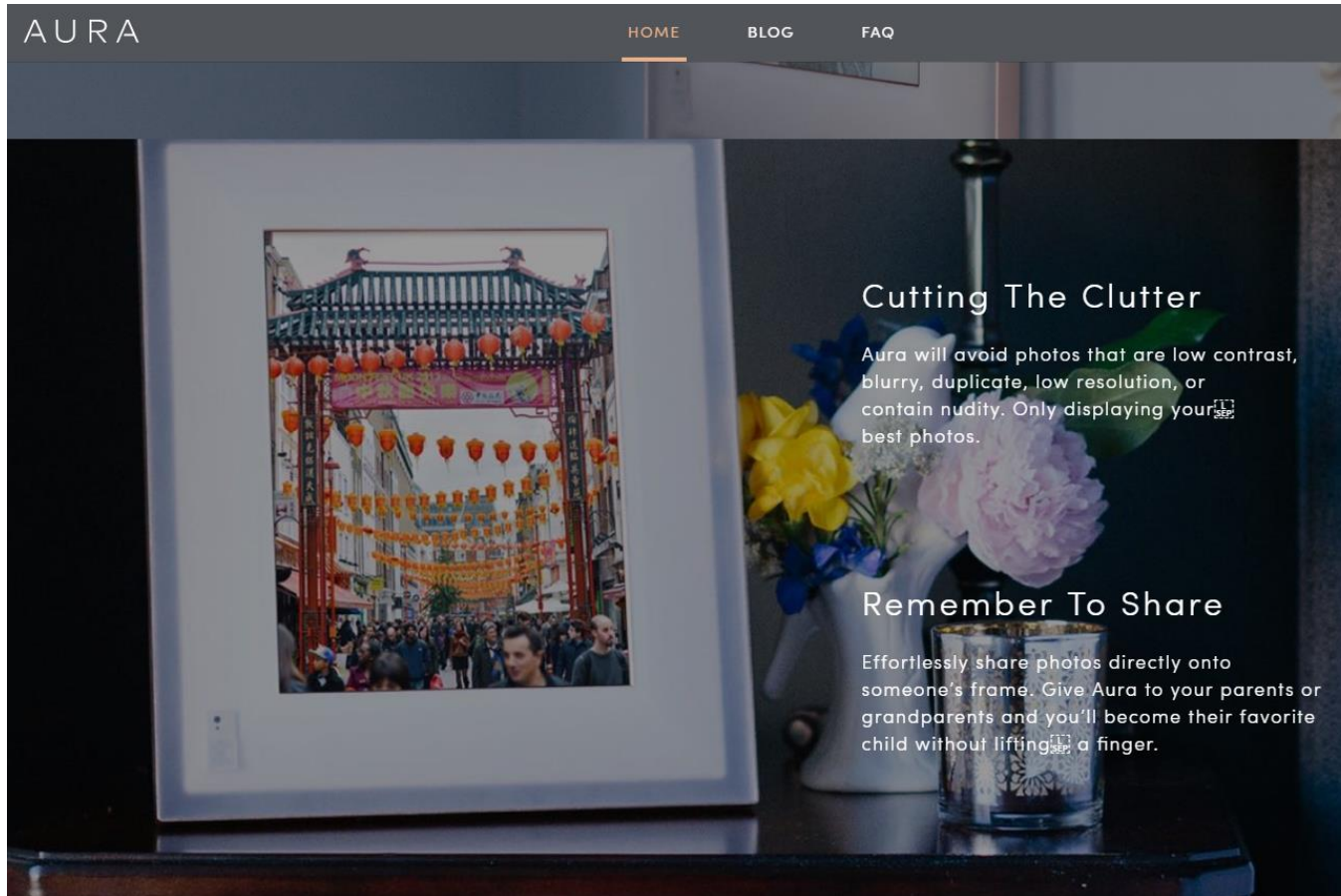
HEATMAP CATEGORY: REG TECH

Total funding: \$29.5M

Select investors: Salesforce Ventures, Talis Capital, IDInvest Partners, Wellington Partners

Machine learning-based background verification.

EVEN THE PHOTO FRAMES IN YOUR HOME



AURA

HEATMAP CATEGORY: SOCIAL

Total funding: \$9.39M

Select investors: Spark Capital

A digital picture frame using facial recognition and gesture control technologies.



Where are we headed?

THE 'ARTIFICIAL GENERAL INTELLIGENCE' DEBATE

Artificial General Intelligence or General AI is the concept of an AI system with human-level intelligence and cognitive abilities that can perform a **broad range of tasks** and apply that knowledge to **solve unfamiliar problems** without being trained to do so.

ARE WE GETTING THERE? MAYBE.



“People sometimes ask how quickly I think we will get there, and my honest answer is I don’t know. We could get there in 3 years or in 30 years. But I do believe that it will happen in this century.”

Marek Rosa

CEO, GoodAI

ARE WE GETTING THERE? MAYBE NOT.

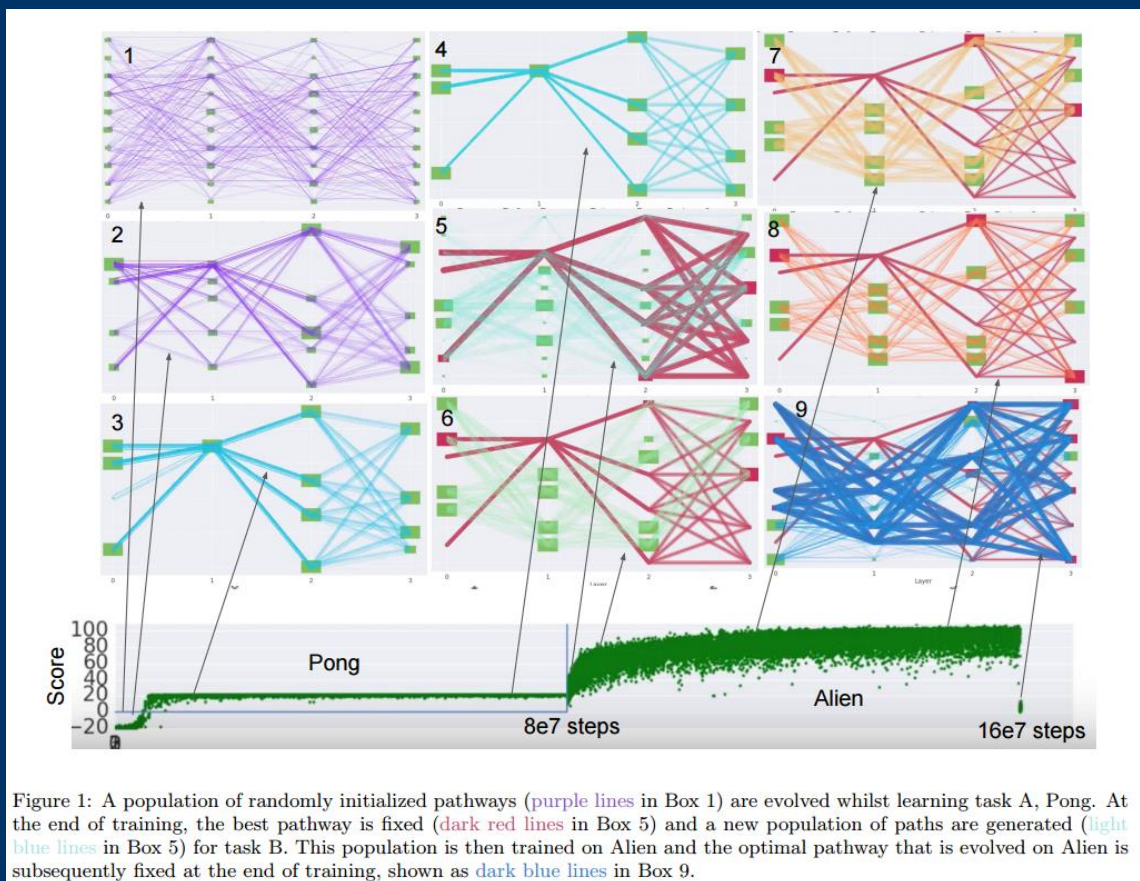


“Creating this kind of advanced software requires a prior scientific understanding of the foundations of human cognition, and we are just scraping the surface of this. This prior need to understand the basic science of cognition is where the ‘singularity is near’ arguments fail to persuade us.”

PAUL ALLEN

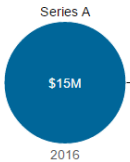
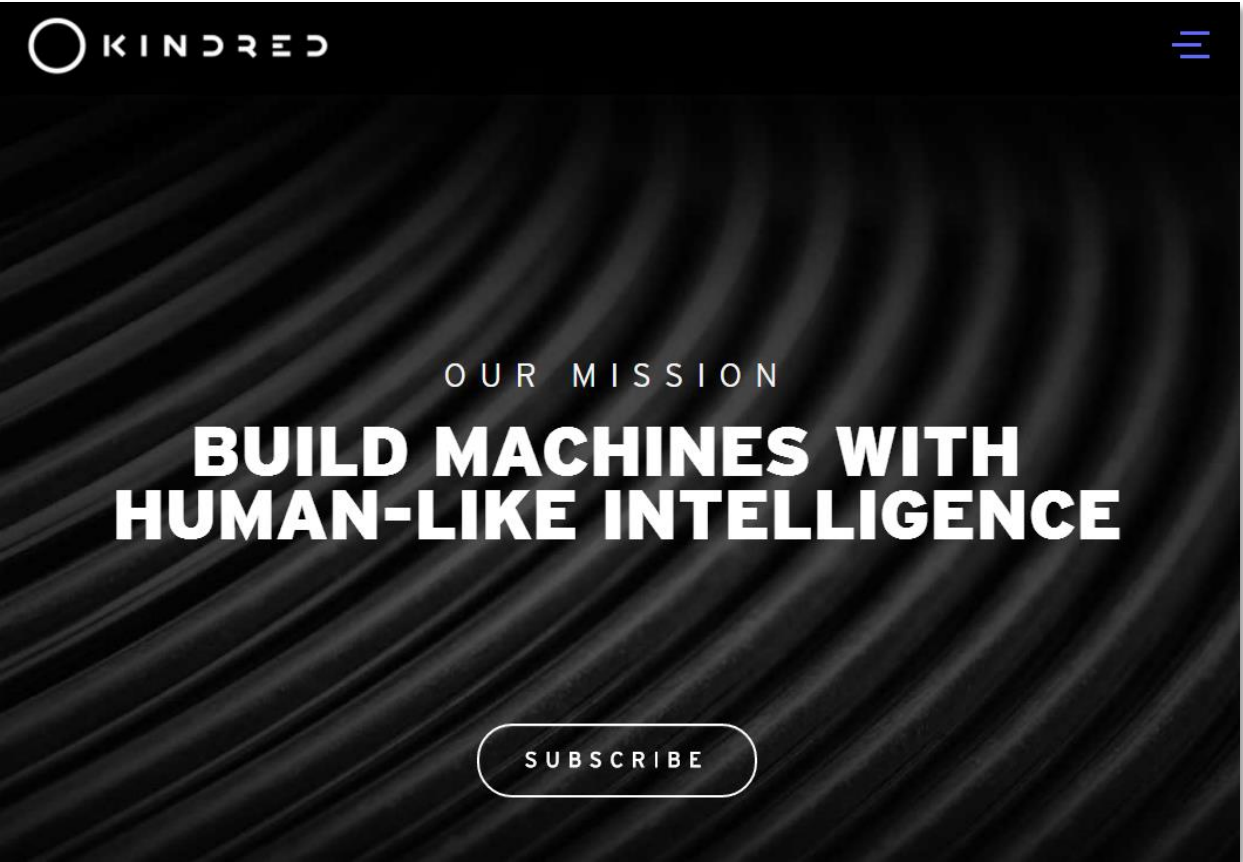
Co-founder, Microsoft

PATHNET: GOOGLE'S DEEPMIND PUBLISHES PAPER ON GENERAL AI'S FIRST STEPS



“For artificial general intelligence (AGI) it would be efficient if multiple users trained the same giant neural network, permitting parameter reuse, without catastrophic forgetting. PathNet is a first step in this direction.”

STARTUPS WORKING ON GENERAL AI: KINDRED



FUNDING HISTORY

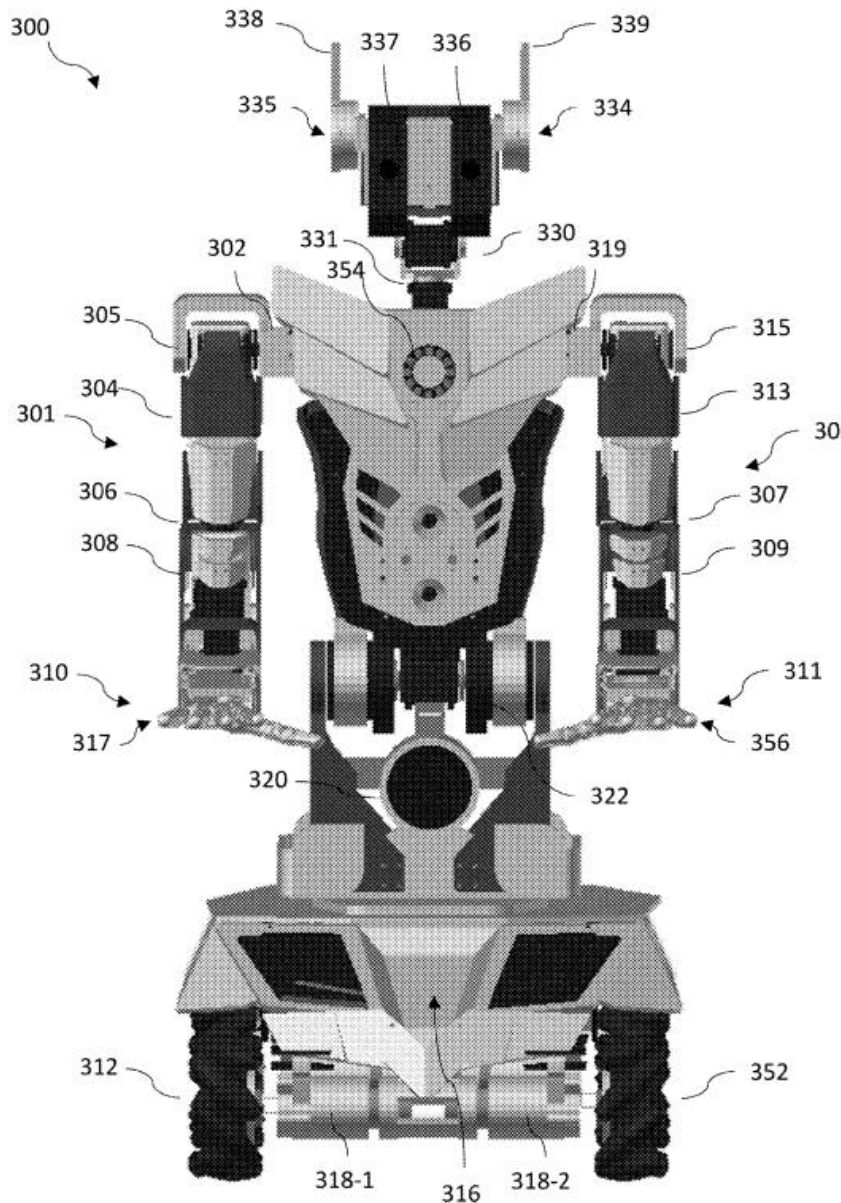
Total Funding
\$15M
161 days
6 months since last funding

SELECT INVESTORS

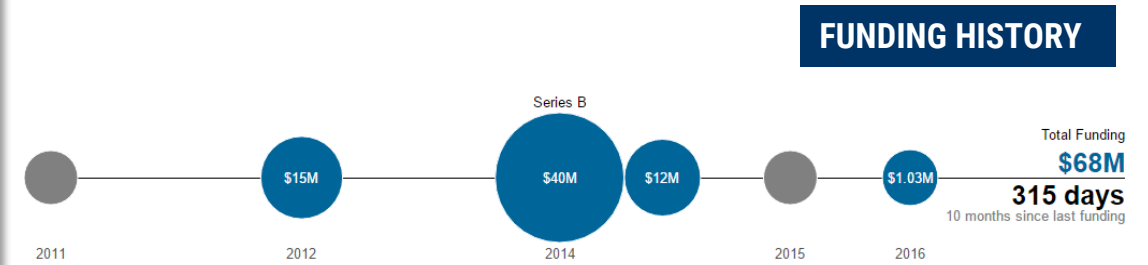
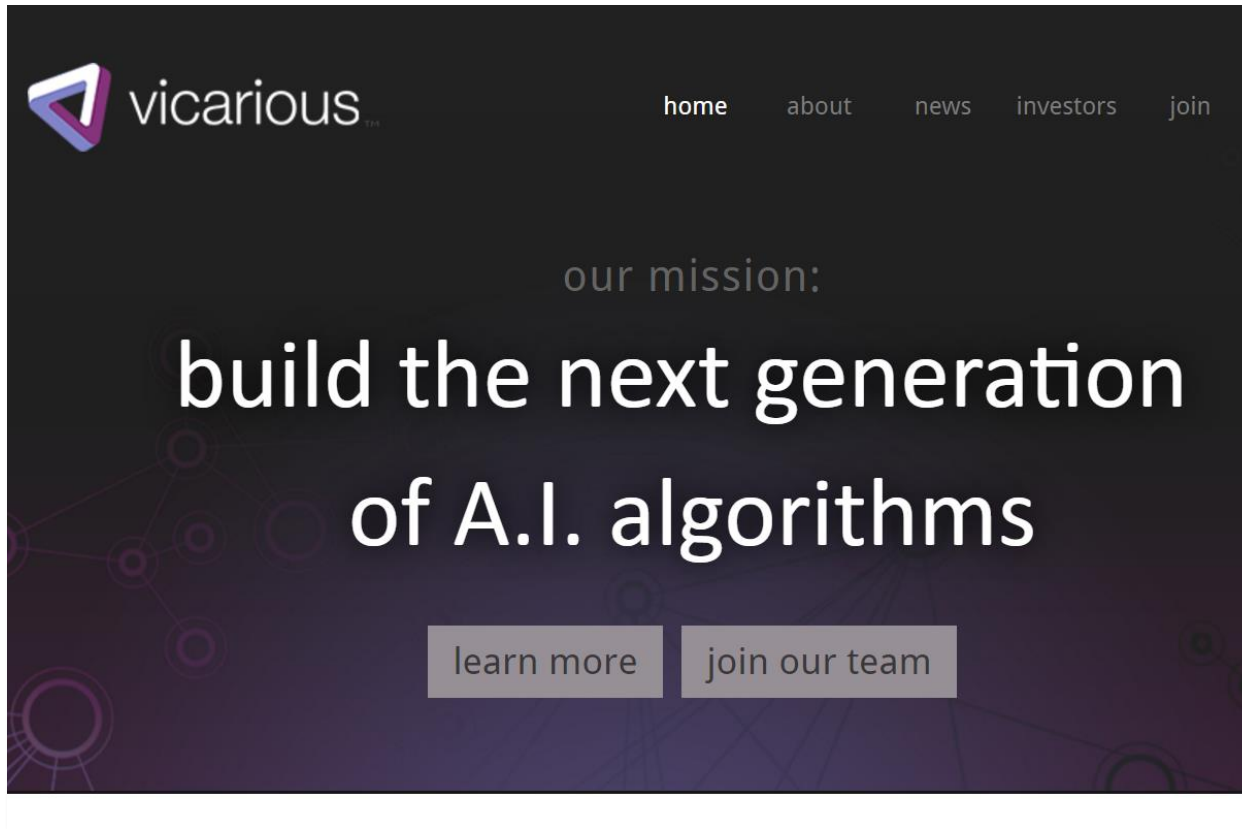
11.2 Capital, AME Cloud Ventures, Bloomberg Beta, Bold Capital Partners, Data Collective, Eclipse Ventures, First Round Capital, Google Ventures, Innovation Endeavors

KINDRED'S PATENT ON ROBOTIC APPARATUS

Kindred Systems' patent filing activity started recently, with 2 patents filed in 2016 titled "facilitating device control" and "methods of self-preservation of robotic apparatus."



STARTUPS WORKING ON GENERAL AI: VICARIOUS

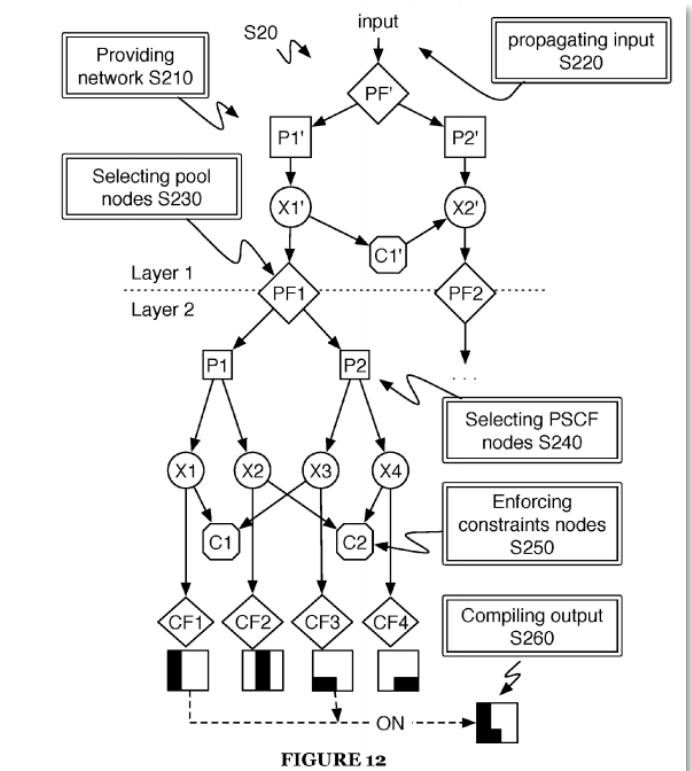
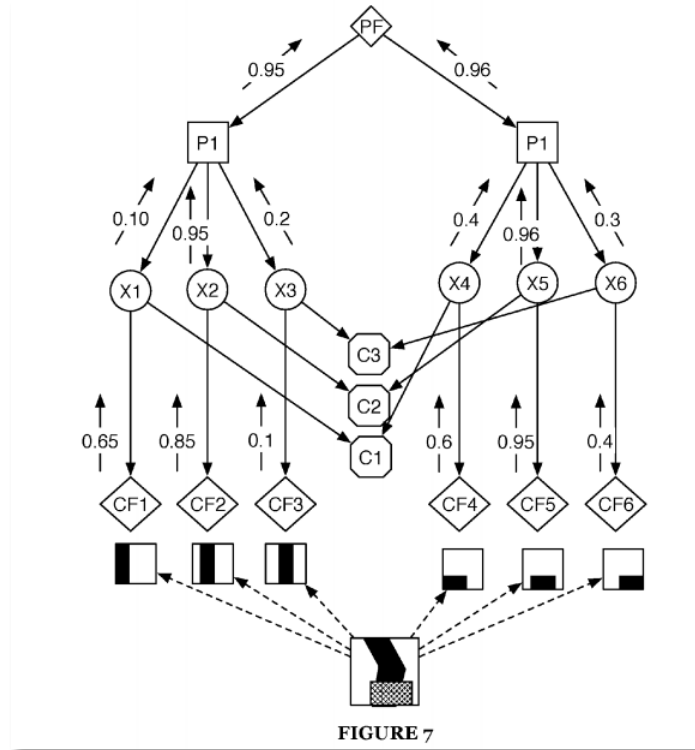
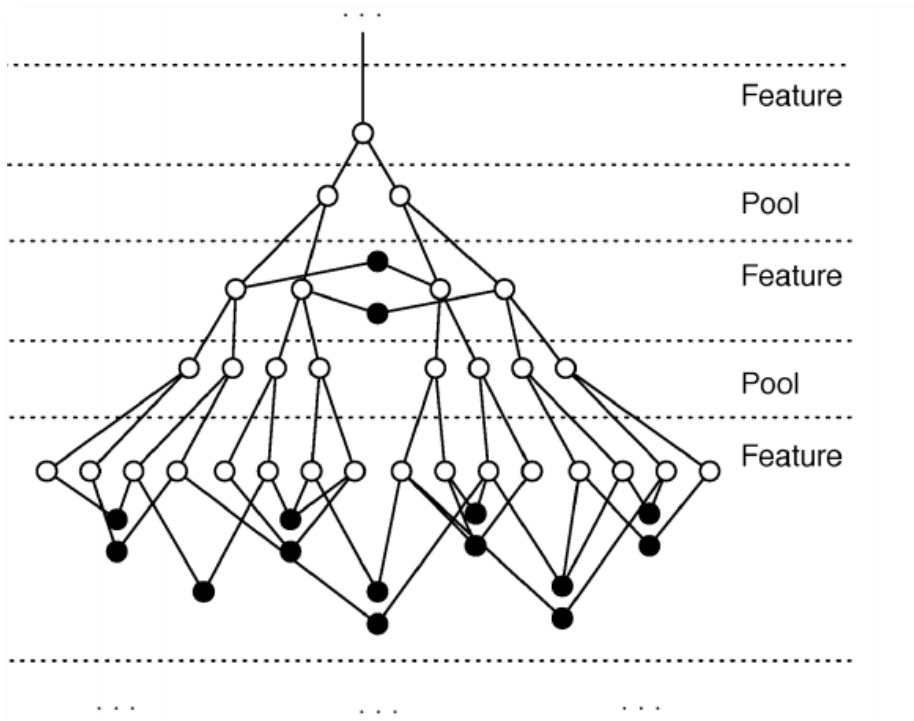


SELECT INVESTORS


Samsung Ventures, Wipro Ventures, ABB Technology Ventures, Marc Benioff, Data Collective, Elon Musk, Felicis Ventures, Formation 8, Good Ventures, Jeff Bezos, Khosla Ventures, Mark Zuckerberg, Open Field Capital, Sam Altman

VICARIOUS FOCUSES ON CORTICAL NETWORKS

Vicarious Systems has applied for around 6 patents since 2013, on topics like object recognition using recursive cortical networks .



STARTUPS WORKING ON GENERAL AI: NUMENTA




Search...

Leading the New Era of Machine Intelligence

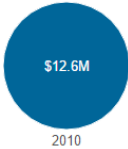
Welcome to **Numenta.com**. Here you'll find information about the company Numenta. If you would like to learn about Numenta's HTM community and open source project visit [Numenta.org](https://numenta.org).

Numenta is tackling one of the most important scientific challenges of all time: reverse engineering the neocortex. Studying how the brain works helps us understand the principles of intelligence and build machines that work on the same principles. We believe that understanding how the neocortex works is the fastest path to machine intelligence, and creating intelligent machines is important for the continued success of humankind.

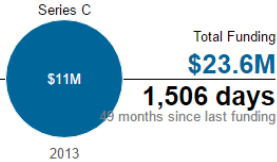
We are at the beginning of a thrilling new era of computing that will unfold over the coming decades, and we invite you to learn about how our approach is helping to advance the state of brain theory and machine intelligence.



About	Developing a neocortical theory for biological and machine intelligence
Established	Feb 4, 2005 · Redwood City, CA
Employees	15 – 20
Business	Licensing
Content	Blog · Newsletter
Press	Releases · Links
Events	Events
Latest	BAMI adds 2 chapters NEW



FUNDING HISTORY



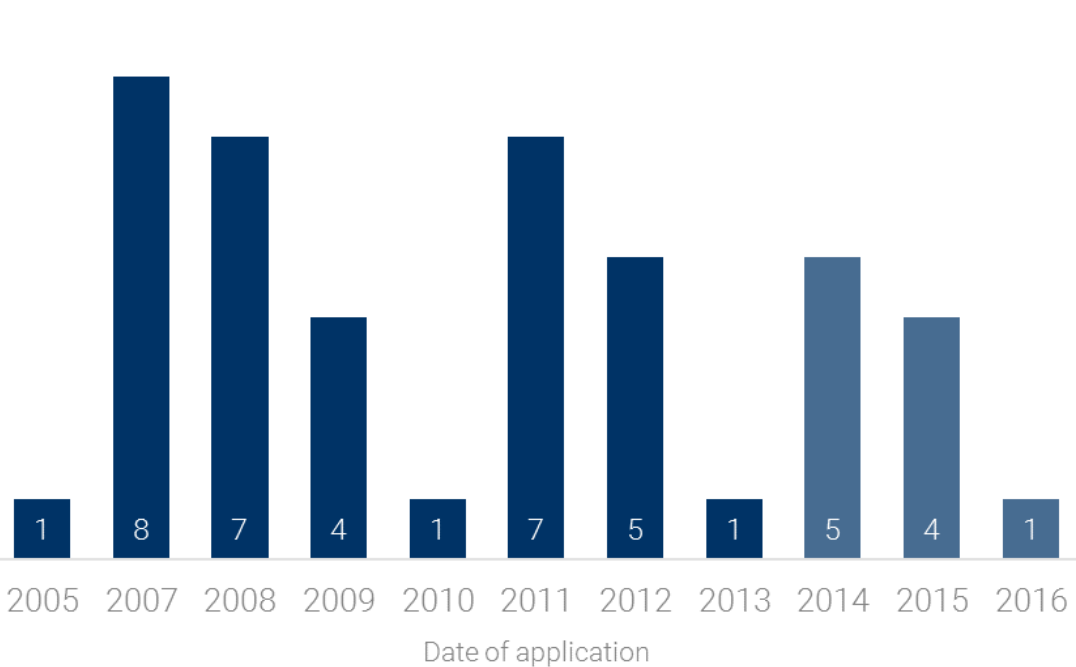
SELECT INVESTORS

Ed Colligan, SkyMoon Ventures

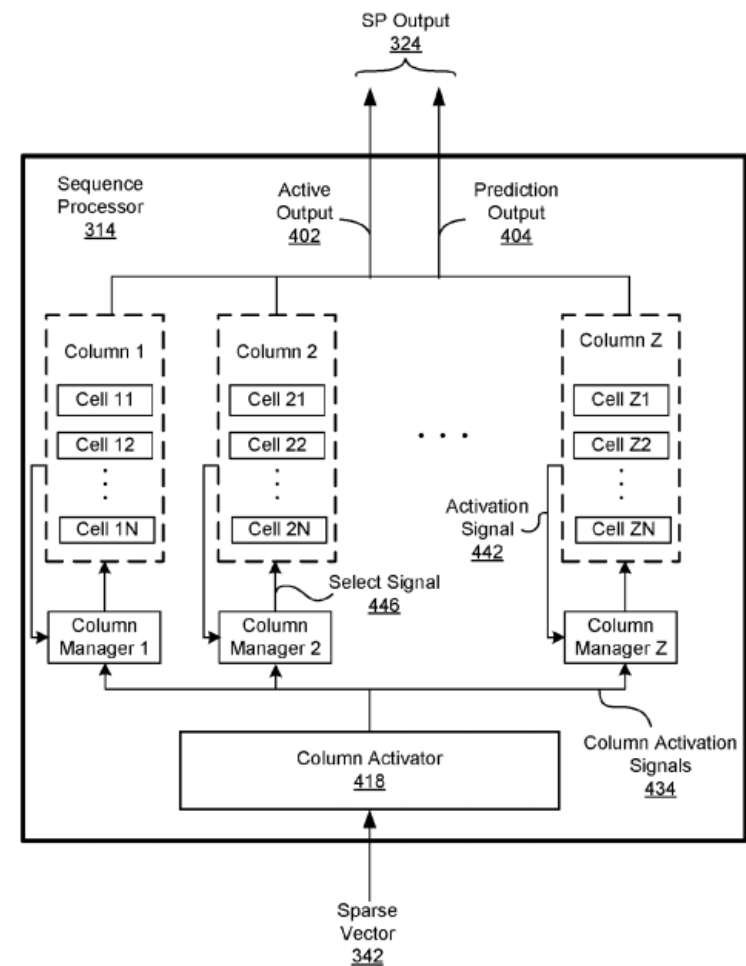
NUMENTA'S PATENT APPLICATION ACTIVITY

Numenta, which is attempting to “reverse engineer the neocortex,” has applied for over 40 patents since 2005.

NUMENTA PATENT APPLICATION ACTIVITY



Note: The patent filing process involves a significant time-lag before the publishing of patent applications. This delay can range from several months to over two years, meaning that records prior to 2013 are likely complete at the time of analysis, but there may be applications from 2014 on that have yet to be published.





In 50 years, this 18-month period we're in now will be seen as being crucial for the future of the A.I. community.... It's when the A.I. community finally woke up and took itself seriously and thought about what to do to make the future better."

Stuart Russell

Computer science prof. at UC Berkeley

CBINSIGHTS

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dvaradharajan@cbinsights.com