



Top AI Trends To Watch In 2018



China is racing ahead in AI. Deep learning is getting a make over. AI is coming to Cannabis tech. We look at 13 artificial intelligence trends reshaping industries and economies.

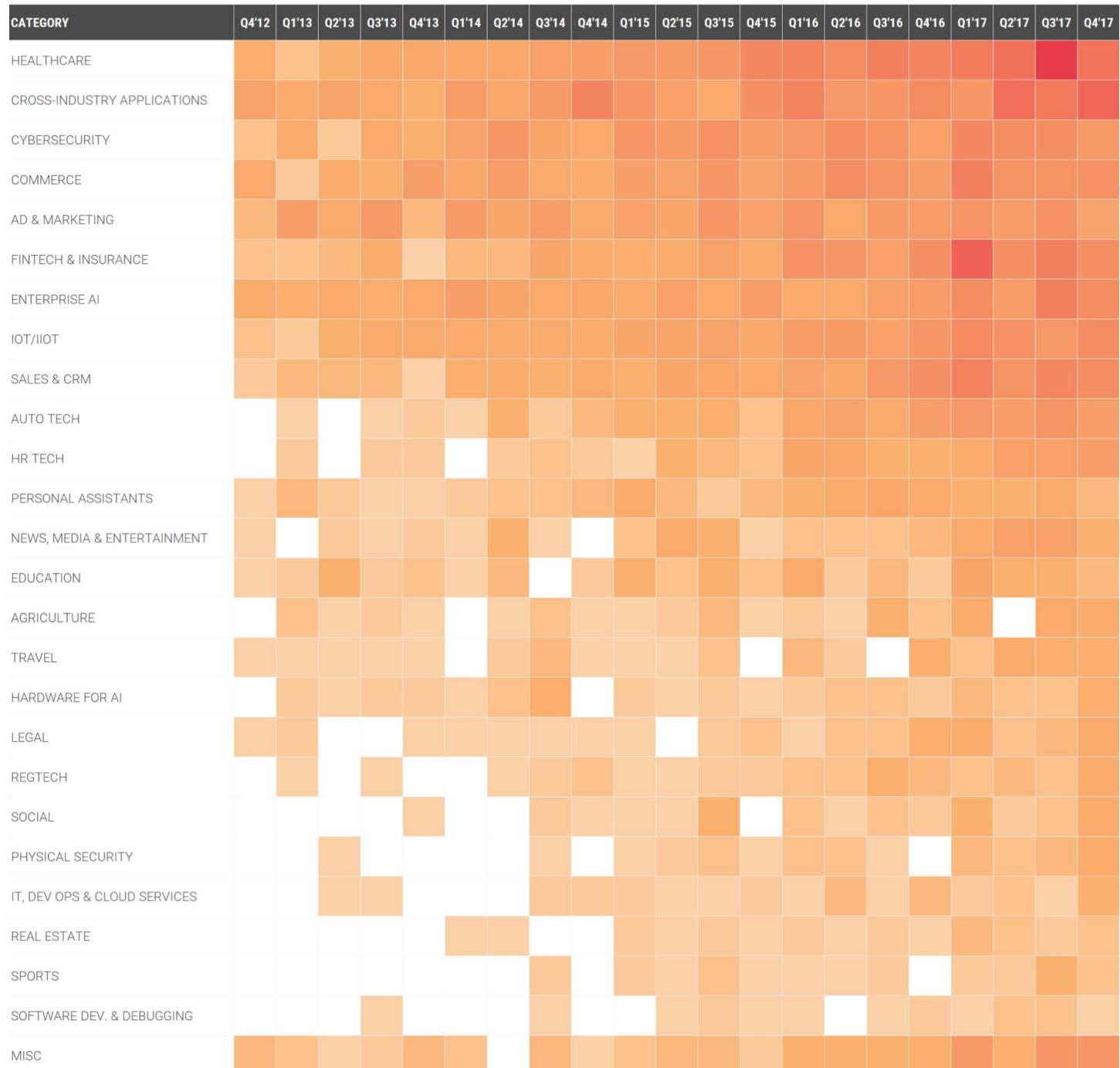
Artificial intelligence is changing the fundamental structure of every industry in areas ranging from agriculture to cybersecurity to commerce to healthcare, and more. We're also interacting with technology in new ways, from giving voice commands to washer-dryers to playing advanced gesture-controlled video games.

Governments are competing to establish superior AI research, seeing AI as a lever for greater economic influence and power.

We are also in the early stages of drastic shifts in the labor market. The hype around machine learning may start to fade – but that's because machine learning has already penetrated virtually every major piece of software, from calendar apps to search engines to sales management software.

AI is heating up across every industry

Equity deals Q4'12–Q4'17

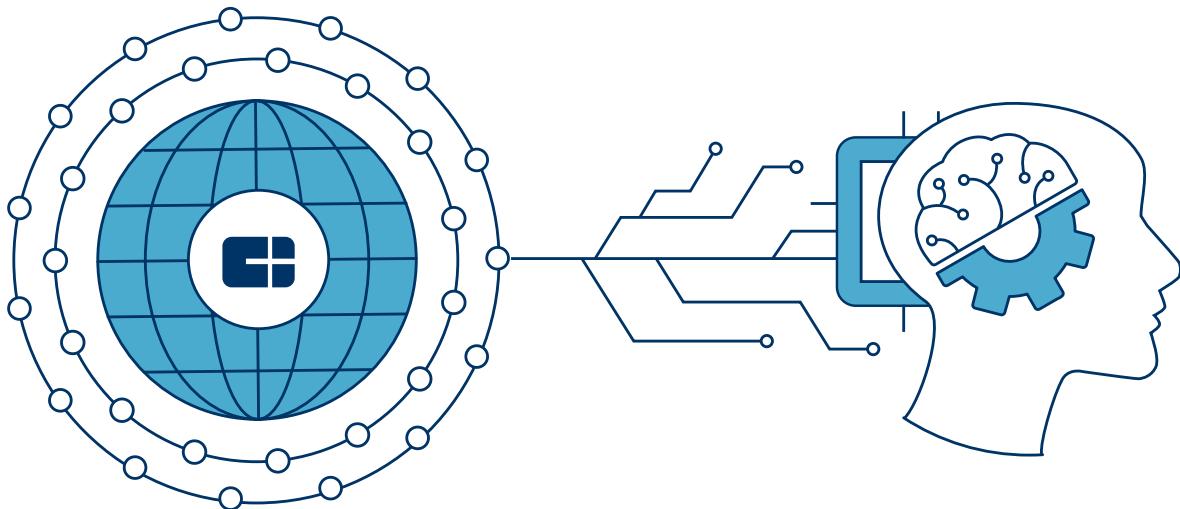


AI can now out-bluff world poker champions. A humanoid robot can do a perfect back flip and land on its feet. But despite these advances, AI algorithms are far from perfect in basic tasks that are easy for humans, such as understanding a scene in an image or recognizing a conversation's context.

Meanwhile, the promise of general AI — or artificial intelligence that can quickly learn new tasks without supervision — remains uncertain. Although a handful of companies like Vicarious Systems and Kindred have raised money to develop general AI, there is little evidence of specifics or real traction.

AI applications today focus on very narrow tasks. But together these narrow AI-driven tasks are reshaping businesses, markets, and industries.

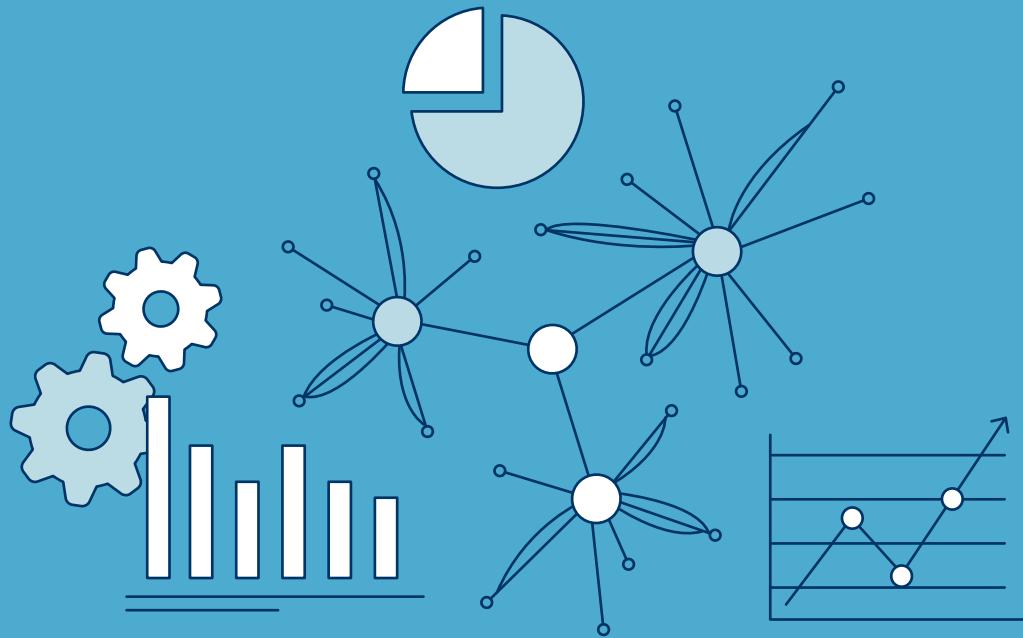
We examined our database for the metrics and trajectories of thousands of AI companies globally to bring you 13 artificial intelligence trends our analysts will be watching in 2018. These range from China's ambitious plans to the emergence of capsule networks to 6-figure salaries for AI specialists.



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Beti Cung,
CORPORATE STRATEGY, MICROSOFT

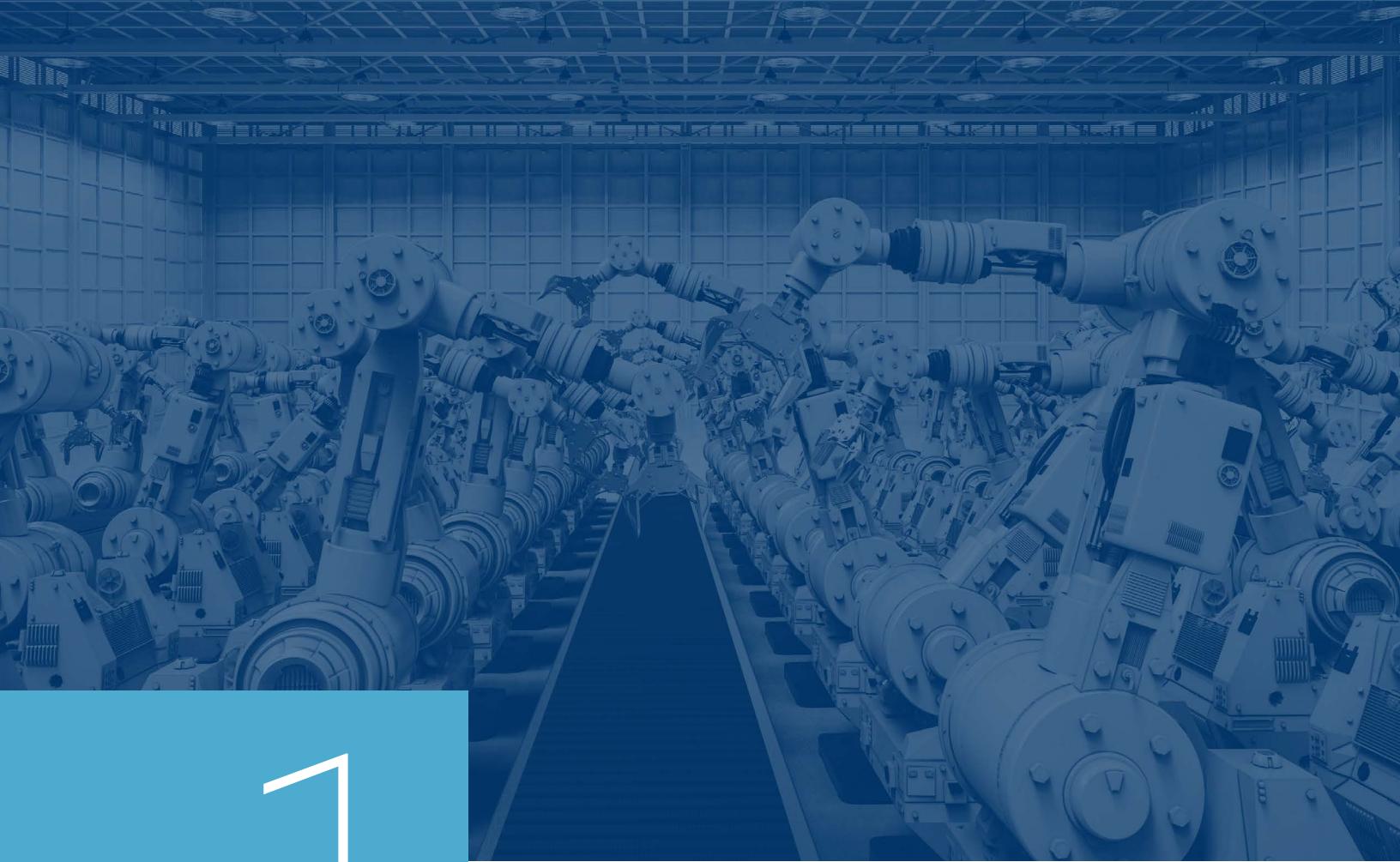


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1

Counterintuitively, industrial robots and manufacturing jobs are both on the rise in the United States.

New blue collar job – robot babysitters

Manufacturing jobs are notoriously vulnerable to being outsourced to developing countries where labor costs are cheaper.

But dropping industrial robot costs can sometimes also bring manufacturing bases closer to site of demand.

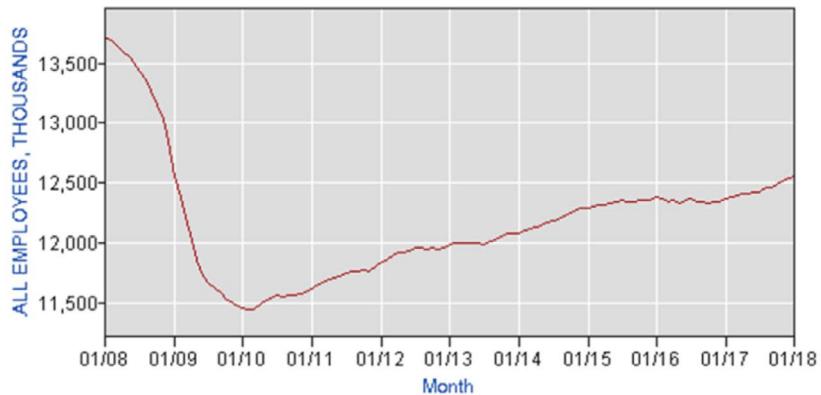
Recently, Chinese T-shirt manufacturer Tianyuan Garments Company signed a Memorandum of Understanding (MoU) with the Arkansas government to employ 400 workers at \$14/hr at its new garment factory in Arkansas. Operations were scheduled to begin by the end of 2017.

Tianyuan's factory in Little Rock, Arkansas, will use sewing robots developed by Georgia-based startup SoftWear Automation to manufacture apparel for Adidas.

It appears much of the heavy lifting will be done by the robots with human workers taking over high-end jobs including robot maintenance and operation.

This means that the number and nature of manufacturing jobs will never equal 2008 numbers.

The Bureau of Labor Statistics includes different types of jobs under its definition of the manufacturing industry. Its outlook for quality control inspectors and assembler and fabricators, for instance, is negative due to the impact of automation.



For context, a 2012 DARPA contract awarded to previously-mentioned SoftWear Automation clearly states “complete production facilities that produce garments with zero direct labor is the ultimate goal.”

But ever-changing consumer preferences and robots that are unable to adapt to drastic process changes stand in the way of complete automation.

This is reflected even in Amazon’s highly automated warehouses.

Amazon’s collaborative warehouse robots perform much of the heavy lifting, while workers focusing on delicate tasks like “picking” items off shelves and slotting them into separate orders.

Robots are still less-than-perfect at gripping, picking, and handling items in unstructured environments. Amazon already uses over 100,000 robots in various warehouses, but at the same time is creating thousands of new jobs for humans in its new fulfillment centers.

2

The 'AI for X' trend is unstoppable. From brewing beer to tending to cannabis buds, machine learning is doing it all.

AI for X is ... everywhere

Artificial intelligence is everywhere. Or more exactly, machine learning is everywhere. Machine learning refers to the training of algorithms on large data sets so that they learn how to identify and generate desired patterns. Over time, the algorithms — provided with the correct parameters by their human creators — get better at their tasks.

This tech can basically be used to do anything, provided there is data to train the software on and a desired outcome in mind.

So: UK's IntelligentX wants to introduce the world's first AI-brewed beer.

DeepFish in Russia is using neural networks to identify, well, fish. It merges radar technology with AI to differentiate between fish and noise in radar images.

Sweden's Hoofstep raised VC money to bring deep learning-based behavioral analysis to horses.

Are you vegan, gluten-free, or allergic to soy? New York's Prose wants to use AI for made-to-order hair products. It raised \$7.57M from well-known VCs including Forerunner Ventures, Lerer Hippeau Ventures, and Maveron.

AI is also coming to cannabis tech. DeepGreen uses computer vision to identify the gender and health profile of cannabis plants. Weedguide raised \$1.7M to use AI for personalized weed recommendations.

From hobbies to revenue-generating ideas to simply taking things too far, we expect to see more out-of-the-box “AI for X” in 2018. More broadly, the prevalence of this trend and increasingly absurd-seeming examples reveal that machine learning is not an exotic technology. Rather, it is one of the building blocks for modern software and applications.



3

China vies with US for global AI leadership

Despite a mere 9% share of deals going to AI startups globally, China's AI startup scene took nearly 50% of dollars going to AI startups globally in 2017, surpassing the United States for the first time for share of dollars.

China is aggressively executing a thoroughly-designed vision for AI. In some areas of AI, China is clearly beating the US.

The Chinese government is promoting a futuristic artificial intelligence plan. It encompasses everything from smart agriculture and intelligent logistics to military applications and new employment opportunities growing out of AI.

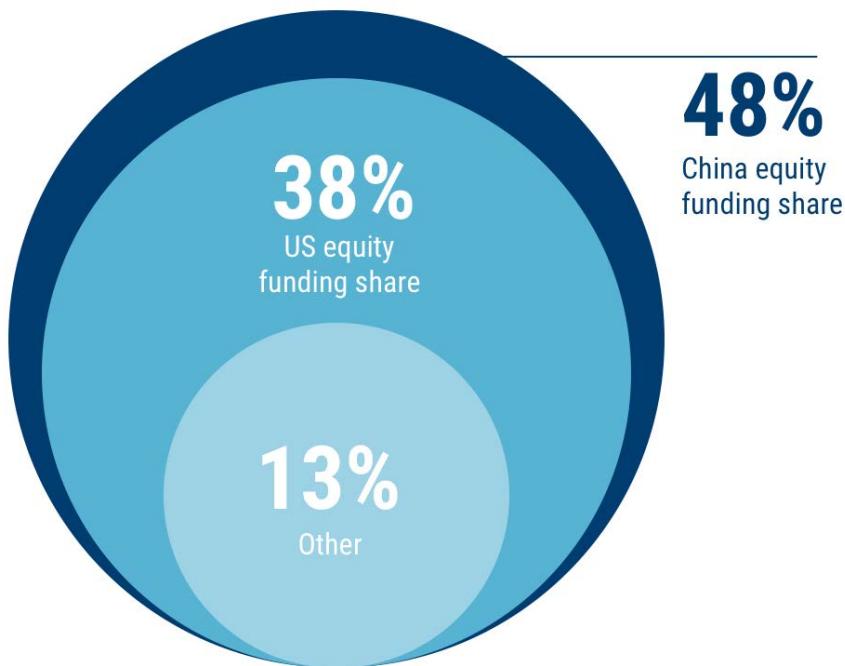
Part of the resources are going to innovative China-based startups developing AI in industries ranging from healthcare to media.

In fact, China accounts for a mere 9% share of deals going to AI startups globally. But China's AI startups took 48% of all dollars going to AI startups globally in 2017, surpassing the United States for the first time for share of dollars.

To put this proportion in perspective, in 2016, China accounted for only 11.3% of global funding.

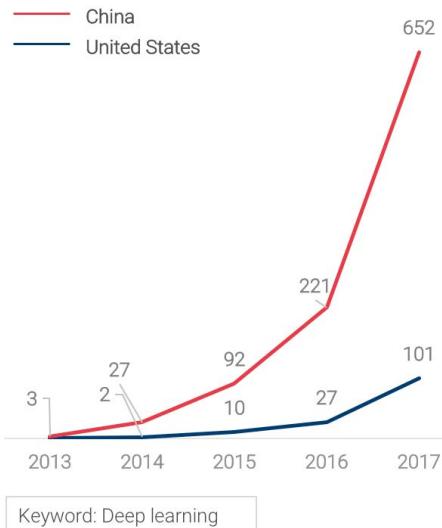
China dominates global AI funding

US vs. China total equity funding to startups in 2017



AI-related patent publications explode in China

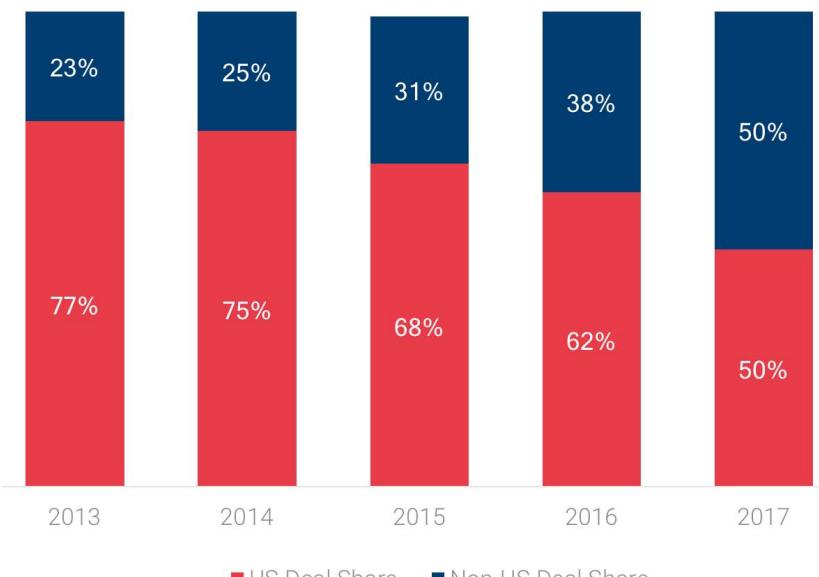
Based on keyword searches of title and abstract, 2013–2017



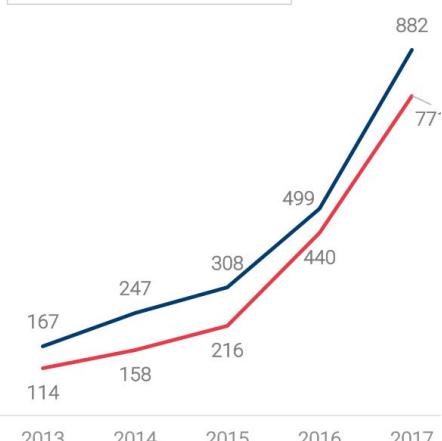
The United States still dominates globally in terms of the number of AI startups and total equity deals. But it is gradually losing its global deal share.

The United States is losing its global AI deal share

Equity deal share, 2013–2017



Keyword: Artificial intelligence



Chinese companies' R&D efforts are reflected in their patent activity.

Chinese companies seem to be overtaking their US counterparts in AI patent applications. Based on basic keyword searches of title and abstract, AI-related patent publications in China are surging far ahead of patents being published in these spaces by the US Patent and Trademark Office.

In deep learning, for example, patents published in China are 6x what they are in the US. (Note: The patent filing process involves a significant time-lag before the publishing of patent applications.)

Keyword: Machine learning

Source: epo.org

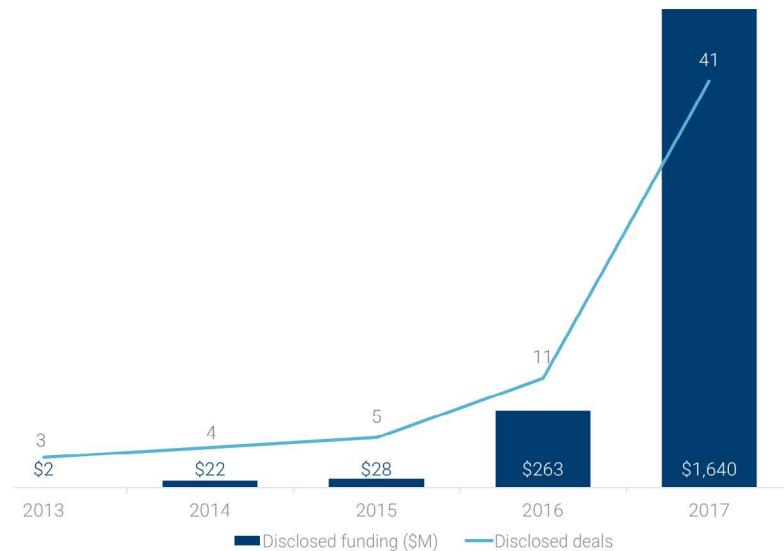
Two prominent technologies fueling China's AI growth are facial recognition and AI chips. The former advances the government's ambitious country-wide surveillance plans, while the latter is a direct challenge to US-made chips.

Three key players here are China-based unicorns Megvii (dba Face++) and SenseTime, and startup CloudWalk (the latter a recipient of a \$301M grant from the Guangzhou Municipal Government).

In 2017, around 55 cities in China were part of a plan called Xue Liang or "sharp eyes." Footage from surveillance cameras in public and private properties will be processed centrally to monitor people and events. Media reports suggest that this may eventually power China's Social Credit System: a metric to gauge the "trustworthiness" of its citizens.

China invests heavily in facial recognition technology

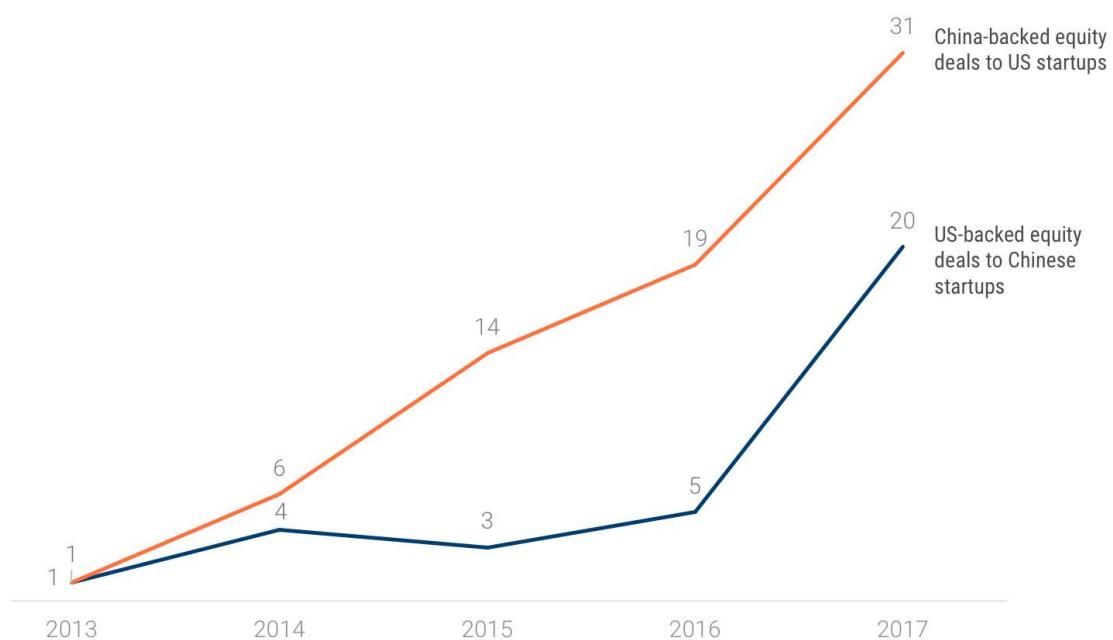
All deals, including grants, 2013 - 2017



Startup Megvii already has access to 1.3 billion face data records on Chinese citizens and is backed by Chinese insurance companies (Sunshine Insurance Group), government entities (Russia-China investment group), and corporate giants (Foxconn, Ant Financial).

Cross-border AI investments are on the rise

Equity deals, 2013 - 2017



Two investors in the company, Alibaba Group (through Ant Financial) and Foxconn, partnered with Hangzhou city in China in 2016 for the "City Brain" project, using AI to analyze data from surveillance cameras and social feeds.

Ant Financial separately uses facial recognition for payments at Alibaba-owned retail stores.

The United States and China are also competing on dominance in AI chip technology.

In July 2017, the Chinese government said it planned to reach parity with the United States on artificial intelligence by 2020 and become the world leader by 2030. One government-backed project is to create a chip that has 20 times the performance

and energy efficiency of NVIDIA's GPUs. Chinese company Cambricon is pledging to make one billion processing units in the next three years and is developing chips specifically for deep learning.

Key Chinese tech giants like Baidu and JD are investing in AI companies abroad, including in the US.

Recently, Baidu and JD.com backed ZestFinance, and Tencent backed NY-based ObEN. Some start-ups like WuXi NextCODE and Pony.ai are operating in both countries, further blurring competitive lines.

Despite scrutiny of Chinese companies seeking partnerships or investments in the US, there are more Chinese investments in AI startups in the US, than vice-versa.

4

The AI-cybersecurity market is getting increasingly crowded. Some of the startups boast a roster of government clients hoping to stay one step ahead of hackers.

The future of defense turns on AI

The battlefield is moving to data centers.

As far back as in 2014, Amazon built a custom cloud computing service for the CIA, meeting stringent compliance and regulatory requirements for sensitive data.

In Q4'17, AWS opened these tools to other government customers outside the intelligence community.

Amazon has also acquired two AI-cybersecurity companies – Harvest.ai and Sqrrl – for securing sensitive data in the cloud.

Whether it's Amazon or a host of new startups catering to government clients, AI promises to be the backbone of new government-sponsored cybersecurity efforts.

In the Cold War, governments talked about their “missile gaps,” or their disadvantages relative to rivals in terms of nuclear warheads. Now, governments increasingly rate their gaps in terms of cyber capabilities. As a result, the worlds of cybersecurity and traditional defense are merging.

Data breaches bring the risks into sharp relief: from the Equifax leak of millions of citizens' social security numbers to WannaCry ransomware to Russian meddling in elections in the US and elsewhere.

US government organizations received one of the lowest scores for cybersecurity in a 2017 analysis by SecurityScorecard (a New York-based company backed by Intel Capital and Moody's Corporation, among others). The analysis included "552 local, state, and federal government organizations, each with more than 100 public-facing IP addresses."

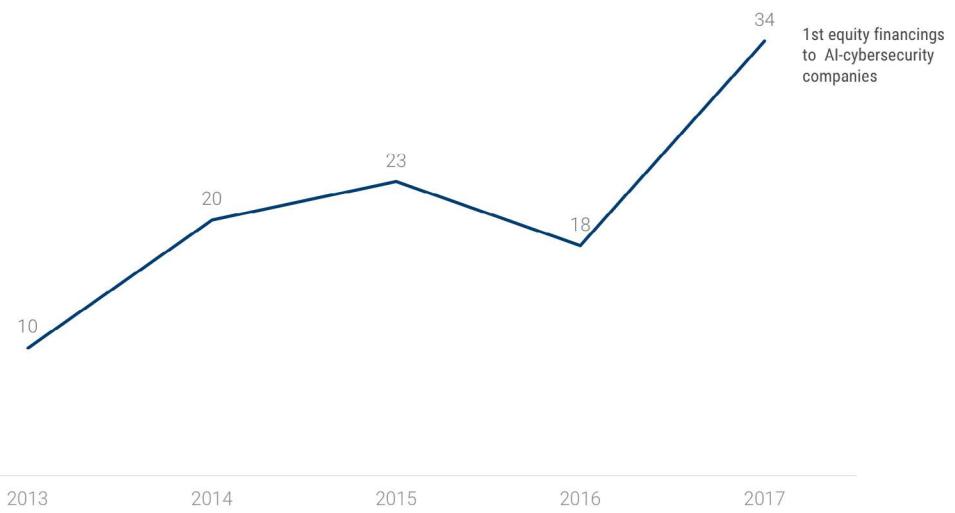
Cybersecurity poses a real opportunity for the deployment of AI algorithms, since attacks are constantly-evolving and defenses frequently face previously-unknown types of malware. Presumably, AI would have an edge here given its ability to operate at scale and sift through millions of incidents to identify anomalies, risks, and signals of future threats.

The market is now flooded with new cybersecurity companies trying to leverage machine learning to some degree.

A total of 134 startups have raised \$3.65B in equity funding in the last 5 years. About 34 of them raised equity for the first time last year to compete in a market still dominated by larger companies like Cybereason, CrowdStrike, Cylance, and Tanium — each with \$900M+ valuations.

New AI-cybersecurity startups enter market dominated by unicorns

1st equity deals, 2013 - 2017



Even a traditional consulting firm like Accenture has been scaling its technology in AI-cybersecurity to better serve federal government clientele. A notable deal here is startup Endgame, which has clients like the US Air Force. Endgame sold its government services division to Accenture.

The intelligence community's venture arm In-Q-Tel funded Anomali, Interset, and Cylance in 2016. UK's Darktrace claims its system has over 3,000 worldwide deployments, including use by government agencies. Colorado-based Logrhythm works with the US Air force, NASA, and defense contractor Raytheon.

Other top defense contractors are investing here as well. Lockheed Martin was an early investor Cybereason (currently valued at over \$900M). In 2017, Boeing backed Texas-based cybersecurity startup SparkCognition through its venture arm HorizonX.

5

Amazon Echo and Google Home dominate the smart home speaker market. But non-English speaking markets are currently underserved by the big tech companies.

¿Cómo estás, Alexa?

Alexa has unleashed a voice revolution.

Voice-enabled computing was all the buzz at the Consumer Electronics Show in 2018. Hardly any IoT device was without integration into the Amazon Echo or Google Home.

Samsung is now working on its own voice assistant, Bixby. It wants all of its products to be internet-connected and have intelligence from Bixby by 2020. LG made all of its appliances in 2017 WiFi-enabled. Over 80 LG products now integrate with Google Home.

Although Amazon had an early lead in voice computing, it has fallen behind in terms of language support.

Amazon announced last quarter that it'll start shipping its Alexa-powered speakers to around 80 countries. But on the downside, it expects users around the globe to either interact in English, German, or Japanese.

Google Home is available in English, German, French, and Japanese. Apple's HomePod currently is available in English only, despite its plans of launching soon in Germany and France.

Google has a significant advantage over Amazon here. Google Assistant for Android phones is available in English, French, German, Italian, Japanese, Korean, Spanish, and Portuguese. Its speech recognition capabilities – used for speech-to-text conversions and voice searches – extends to 119 languages.

The Spanish smart home market is currently underserved by big tech companies, despite being one of the most widely spoken languages in the world after Mandarin.

In China, Alibaba reported that its Chinese-speaking Tmall Genie (its version of Amazon Echo) has sold over 1 million units since officially launching in July 2017.

In 2018, we will continue to see voice assistants battle it out for dominance in non-English speaking markets.

6

White collar workers – including lawyers, consultants, financial advisors, journalists, traders, and more – will face the effects of AI as much as blue-collar laborers.

White-collar automation accelerates

A growing wave of AI-infused Expert Automation & Augmentation Software (EAAS, pronounced /ēz/) platforms will usher in a new era of AI-assisted or AI-enhanced productivity.

This AI-enhanced productivity is threatening jobs at the more clerical end of the white-collar spectrum.

The EAAS market map below highlights some of the startups building expert automation & augmentation software across a number of professions and industries ranging from lawyers to journalists to wealth managers to traders to consulting, and more.

For instance, artificial intelligence has huge potential to reduce time and improve efficiency in legal work. On the litigation side, natural language processing (text analytics) can summarize thousands of pages of legal documents within minutes. This is a task that might take a human counterpart several days to complete. Meanwhile, it also reduces the probability of error.

As AI platforms become more efficient and commercialized, this will impact the fee structure of external law firms that charge by the hour.

LAWYERS



HR MANAGERS



MARKETERS



TEACHING ASSISTANTS



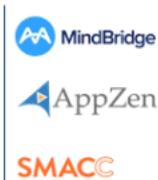
REPORTERS & EDITORS



TRADERS



ACCOUNTANTS & AUDITORS



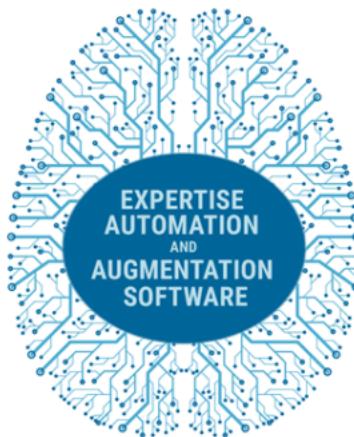
COMPLIANCE OFFICERS



INVESTMENT MANAGERS



SOFTWARE DEVELOPERS



CRM & SALES CLERKS



RESEARCHERS & CONSULTANTS



Programmers are not immune. Early-stage startups are focused on AI-based software testing, debugging, and basic frontend development. One of the top rounds last year went to UK-based DiffBlue, which is developing AI to automate traditional coding tasks like bug fixing, custom code development, and translating code from one programming language to another.

Healthcare and education are considered to be some of the industries least at risk of automation due to the dynamic nature of tasks. These fields also require a high level of emotional intelligence. But in education, for instance, AI startups are beginning to provide ancillary services like paper grading, language coaching, and feedback on writing.



7

2017 saw a major push for bringing AI to the edge, i.e. to smaller devices and sensors operating closer to the periphery of computing networks. In other words, AI may live within your earphones rather than being housed in the cloud or in your smartphone.

AI moves to the edge

AI is getting decentralized.

Intelligence on a device – like a smartphone or a car or even a wearable device – gives it the ability to process information locally and respond quickly to situations, instead of communicating with a central cloud or server.

For instance, an autonomous vehicle has to respond in real-time to what's happening on the road. Decisions are time-sensitive and latency could prove fatal.

Another case for edge AI would be training your personal AI assistant locally on your device to recognize your unique accent or identify faces.

2017 was marked by big tech companies making huge leaps in edge computing.

AI on the edge reduces response times

A few examples of emerging edge AI applications



In-home smart cameras can recognize that a person(s) has entered an area

Eg: IQ cameras,



On-device facial recognition and object recognition, where user data doesn't leave the device

Eg: neural engine
 AI processor



On-board AI making instantaneous driving decisions

Eg: autopilot



Vision for baby monitors, drones, robots, and other devices that can respond to situations without internet connection

Eg: Myriad X



Cloud stores large datasets, trains algorithms, collects edge data, pushes AI model updates

Apple released its A11 chip with a “neural engine” for iPhone 8 and X. Apple claims it can perform machine learning tasks at up to 600B operations per second. It powers new iPhone features like FaceID, which scans a user’s face with an invisible spray of light, without uploading or storing any user data (or their face) in the cloud.

As the dominant processor in many data centers, Intel has had to play catch-up with massive acquisitions. Recently Intel released an on-device vision processing chip called Myriad X (initially developed by Movidius, which Intel acquired in 2016).

Myriad X promises to take on-device deep learning beyond smartphones to devices like baby monitors and drones.

Google proposed a similar concept with its “federated learning” approach, where some of the machine learning “training” can happen on your device. It’s testing out the feature in Gboard, the Google keyboard.

AI on the edge reduces latency. But unlike the cloud, edge has storage and processing constraints.

More hybrid models will likely emerge with intelligent edge devices communicating with each other and a central server.

8

Deep learning has fueled the majority of the AI applications today. It may now get a makeover thanks to capsule networks.

The emergence of 'capsule networks'

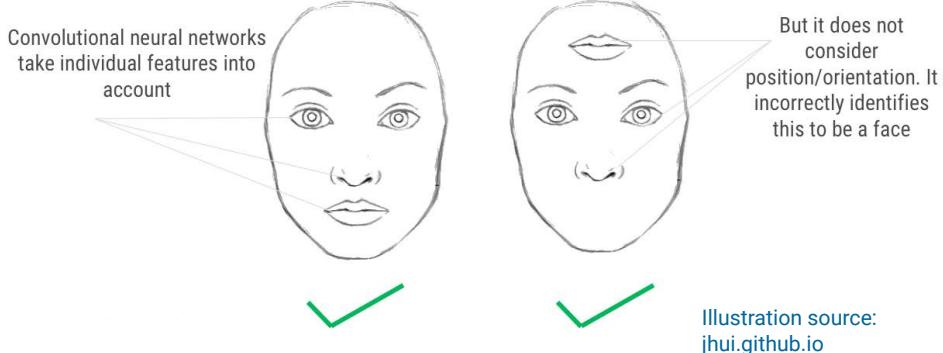
Neural networks have different architectures. A popular one in deep learning today is known as convolutional neural networks.

Now a new architecture, capsule networks, has emerged and promises to outperform convolutional neural networks (CNNs) on multiple fronts.

CNNs, despite their success, have shortcomings that may lead to lack of performance or even security gaps. Researchers are looking for ways to improve AI algorithms and overcome these drawbacks.

The example below shows a very basic illustration. A CNN would identify individual features and mistake the second image to be a face.

Challenges of convolution neural networks

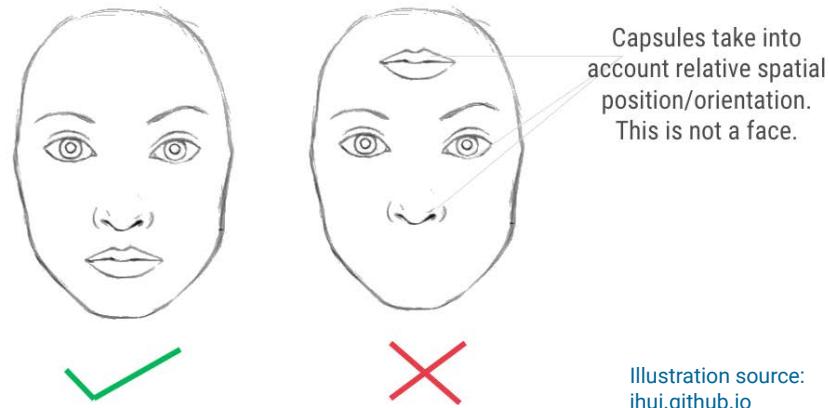


One of the pioneering researchers in deep learning, Google's Geoffrey Hinton, published a research paper in 2017 that introduces the concept of "capsule networks," also known as CapsNet.

The paper is still in the review stage, and will need to be tested in practical scenarios. But the promise it holds has generated a lot of buzz in the media and tech community.

Without getting into technical details, capsule networks would allow AIs to identify general patterns with less data and be less vulnerable to incorrect results. For example, these networks would more easily identify that when features on a face are rearranged it is no longer a face. This is something convolutional networks are not good at.

Promise of capsule networks



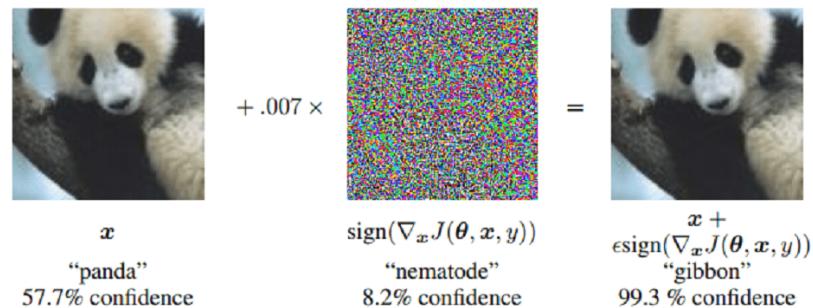
Another issue with CNNs is that they cannot handle different variations of input data. For instance, you have to train the algorithm with images of the same object from different angles or viewpoints for a CNN to identify all variations. As a result, it would require a large volume of training data to cover all possible variations.

Capsule networks claim to outperform CNNs here. They would require less training data, and would take relative positions and orientation of an object into consideration without needing to be trained exhaustively on variations.

Hinton's paper also claims that capsule networks have been tested against some sophisticated adversarial attacks (tampering with images to confuse the algorithms) and was found to outperform convolutional neural networks.

Hackers can introduce small variations to fool a CNN.
Researchers at Google and OpenAI have demonstrated this with several examples.

One of the more popular examples is from a 2015 paper. As can be seen below, a small change that is not readily noticeable to the human eye means the image results in a neural network identifying a panda as a gibbon, a type of ape, with high confidence.





9

The demand for AI talent is far outpacing the availability of skilled researchers. Top AI researchers can now mint money in the millions.

6-figure salaries in the AI talent wars

China is hiring AI experts.

Some of the salaries listed are nearly \$567-624K for a senior machine learning researcher at BMW China, and \$315-410K for ML experts at various other companies.

The jobs are listed on Liepin, a recruitment platform that is itself a unicorn startup from China.

According to a recent Tencent report, the estimated number of qualified researchers currently in the field is 300,000, including students in relevant research areas. Meanwhile, companies likely require a million or more AI specialists for their engineering needs.

In the US, a Glassdoor search for “artificial intelligence” shows over 32,000 jobs currently listed, with several salary ranges well into the 6 digits.

Big tech companies are scooping up the crème-de-la-crème of AI with competitive salary packages.

Deepmind Technologies (acquired by Google in 2014) reported in its financial statement last year that “staff costs and other related costs” accounted for £104.8M. A quick LinkedIn search puts the staff number at 415. Assuming this as team size in 2016, and discounting other expenses, this puts the average employee salary for the team at £252,000 (around \$350,000 per annum).

DEEPMIND TECHNOLOGIES LIMITED

Notes to the financial statements For the year ended 31 December 2016

3. Turnover

The turnover represents research and development fees from other group undertakings (US) amounting to £40,283,597.

4. Operating loss

Operating loss is arrived at after charging the following:

	Year ended 31 Dec 2016 GBP	Year ended 31 Dec 2015 GBP
Staff costs and other related costs	104,774,132	44,284,695
Management service fee	41,141,450	-
Depreciation	85,641	-
Amortization of intangible assets	777,904	-
Advertising and promotional expense	1,848,927	270,646
Legal fees	658,144	146,881
Audit	11,005	9,891
Professional services	3,873,872	630,077
Other administrative expenses	10,640,922	8,820,453
	<u>163,811,997</u>	<u>54,162,443</u>

Source: Companies House, United Kingdom

Adding to this, AI researchers at big tech corporations are also leaving to start their own companies.

Andrew Ng left Baidu to launch a \$175M AI fund. The chief technology officer of stealth AI chip startup Groq worked at the hardware engineering unit for the Tensor Processing Unit at Google and later at Google X.

The CTO and co-founder of chip startup Horizon Robotics was a previous Baidu employee who led the image recognition team at the Baidu Deep Learning Institute.

With talent bleeding to startups, the talent war becomes even more intense.



10

Machine learning will soon become the new normal. And the 1,100+ new AI startups that emerged after 2016 will need robust business models to stay alive.

The machine learning hype will die

First came big data, then the cloud, then the machine learning frenzy.

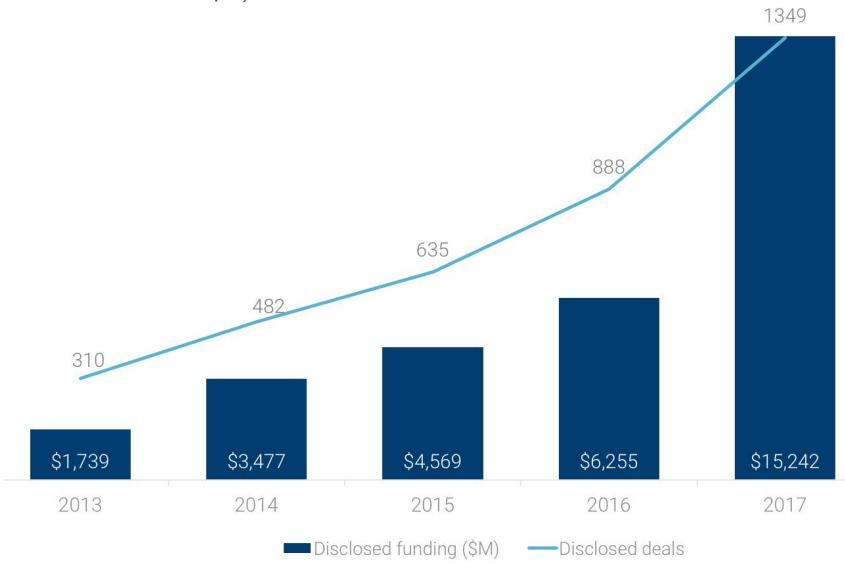
We reached peak machine learning in 2017. Incubators alone housed more than 300 AI startups, up 3x from the previous year.

Last year investors poured in over \$15.2B in funding to AI startups across industries. It was a 141% jump in funding from 2016.

Over 1,100 new AI companies have raised their first rounds of equity funding since 2016. To put this in perspective, that's more than half the historic number of AI startups that have ever raised an equity round.

AI sees 141% funding jump in 2017

Equity deals, 2013 – 2017 (excluding hardware-focused robotics startups)



But the hype will soon die.

The normalization of machine learning will make investors picky about the AI companies they fund.

As Frank Chen of a16z put it, “in a few years, no investors are going to be looking for AI startups.” It will be “assumed” that startups are using the necessary AI algorithms to power their products.

We are already seeing this happen in many industries.

Machine learning is inseparable from IIoT. We need AI to make sense of the vast amounts of data collected from machines and sensors, and process them in real-time. Almost all cybersecurity companies use machine learning to some extent today. In addition to this, big tech companies are offering a suite of machine learning solutions to enterprises.

Top investors are carefully gauging startups using AI. For instance, diagnostics startup Freenome was sent 5 unlabeled blood samples for analysis with its AI-powered algorithms before a16z decided to back the company.



11

Investors poured in \$1.8B into enterprise AI startups in 5 years. Now Amazon, Microsoft, and Google may make smaller companies obsolete.

Amazon, Google, Microsoft dominate enterprise AI

As companies struggled to integrate machine learning into their products, startups emerged to provide ML-as-a-service.

Now, as big tech companies like Google, Amazon, Salesforce, and Microsoft improve their enterprise AI offerings, they will make smaller companies and funding to the space obsolete.

Google released Cloud AutoML. Customers can bring their own data to train the algorithms to suit their specific needs.

Amazon began selling AI-as-a-Service with "Amazon AI" under its AWS banner. Amazon AI's goal is to serve big and

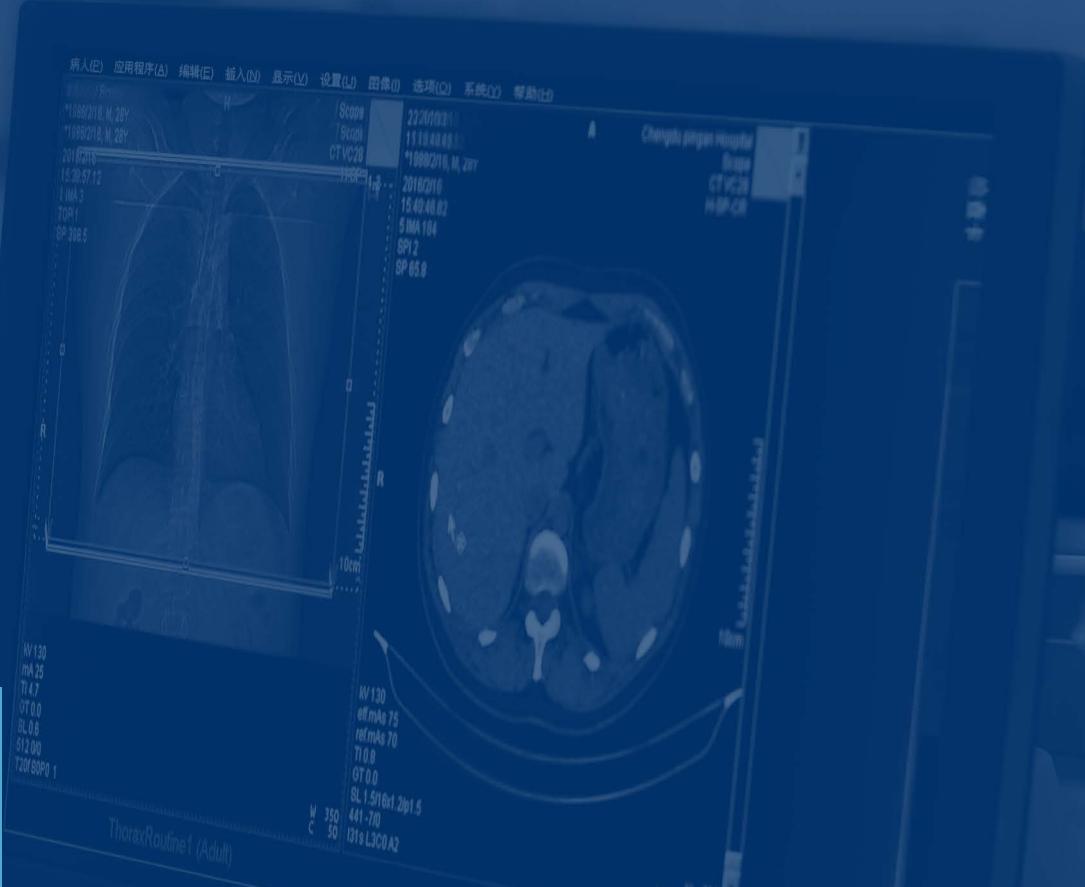
small-time developers that want AI without the upfront costs or hassle. It unveiled offerings that will work like an API and allow any developer to access Lex (the NLP inside Alexa), Amazon Polly (speech synthesis), and Amazon Rekognition (image analysis).

In Q4'17, Amazon expanded its services to include video recognition, audio transcriptions, and sentiment analysis. AWS has a massive footprint. Its fourth quarter revenue alone was \$5B, up 44% quarter-to-quarter.

Microsoft is competing neck and neck with Amazon. Salesforce and other companies like Oracle are also not far behind.

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*It will soon
be routine for
machine learning
to play a role in
medical imaging
and diagnostics.*



AI diagnostics gets the nod from regulators

US regulators are looking at approving AI for use in clinical settings.

The promise of AI in diagnostics is early detection and increased accuracy.

Machine learning algorithms can compare a medical image with those of millions of other patients, picking up on nuances that a human eye may miss. It can do in seconds what a human would take hours to complete.

Consumer-focused AI monitoring tools like SkinVision – which uses computer vision to monitor suspicious skin lesions – are already in use. But a new wave of healthcare AI applications will institutionalize ML capabilities in hospitals and clinics.

This month AstraZeneca announced a partnership with Alibaba subsidiary Ali Health to develop applications including AI-assisted screening and diagnostics in China.

This comes on the heels of GE and Nvidia's partnership to bring deep learning capabilities to GE's medical imaging devices, and

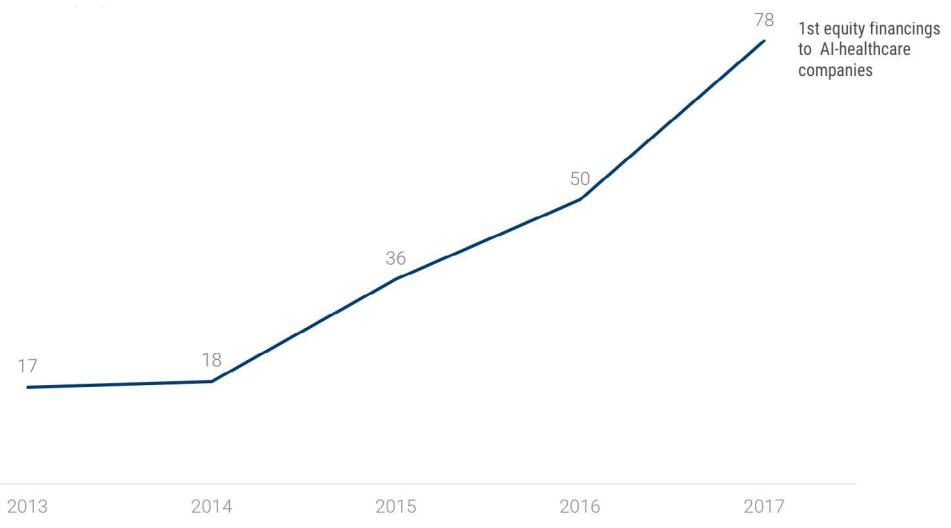
Google DeepMind's advances in using AI to diagnose eye diseases.

Big names Google DeepMind, IBM, GE, and Alibaba make this a tough market for smaller startups to compete in. But this hasn't stopped new companies from venturing into the space.

Healthcare is the hottest area of AI startup investment as our heatmap at the beginning of the report showed. Much of this growth is fueled by medical imaging & diagnostics companies.

The increasingly crowded healthcare AI space

1st equity deals, 2013 - 2017



One of the first FDA approvals was for startup Arterys. Its cloud computing platform was approved for analyzing cardiac images, reportedly based on a series of tests for accuracy and speed of diagnosis. It is now applying for FDA approval for AI in oncology.

Another startup, MedyMatch, is using deep learning to detect intracranial hemorrhage from CT scans. The FDA recently gave it a "breakthrough device designation" to expedite the process of bringing the product to market.

The biggest bone of contention in a high-stakes industry like healthcare is who takes responsibility for misdiagnosis by AI software. The current wave of applications are all geared to assist radiologists and physicians, as opposed to serving as a final verdict on diagnosis.

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*Make your voice
assistant sound
like Dalek from Dr.
Who. Or build your
own AI camera.*

DIY AI is here

You don't need a PhD in computer science or mathematics to build your own AI.

Between open source software libraries, hundreds of APIs and SDKs, and easy assembly kits from Amazon and Google, the barrier to entry is lower than ever before.

Google launched an "AI for all ages" project called AIY (artificial intelligence yourself).

The first product was a do-it-yourself voice recognition kit for Raspberry Pi. From making mid-80s intercoms with intelligent assistants inside of them, to making voice assistants sound like characters from Dr. Who, users are knocking themselves out creating new AI-based inventions.

Google also launched a vision kit with neural network software programs so users can make algorithms to identify dogs and cats, or to match emotion to facial expressions.

Amazon has launched DeepLens, a \$249 deep learning-based video camera. Amazon is offering \$7,500 for the winners of its first DeepLens hackathon, which involves building machine learning projects.