

# 코로나와

# 플랫폼 경제

# AI 기반 기업의 성장과

# AI-Lockin-Loop에 따른

# 독과점 경향

**the rise of**

**the AI-Powered  
Companies**

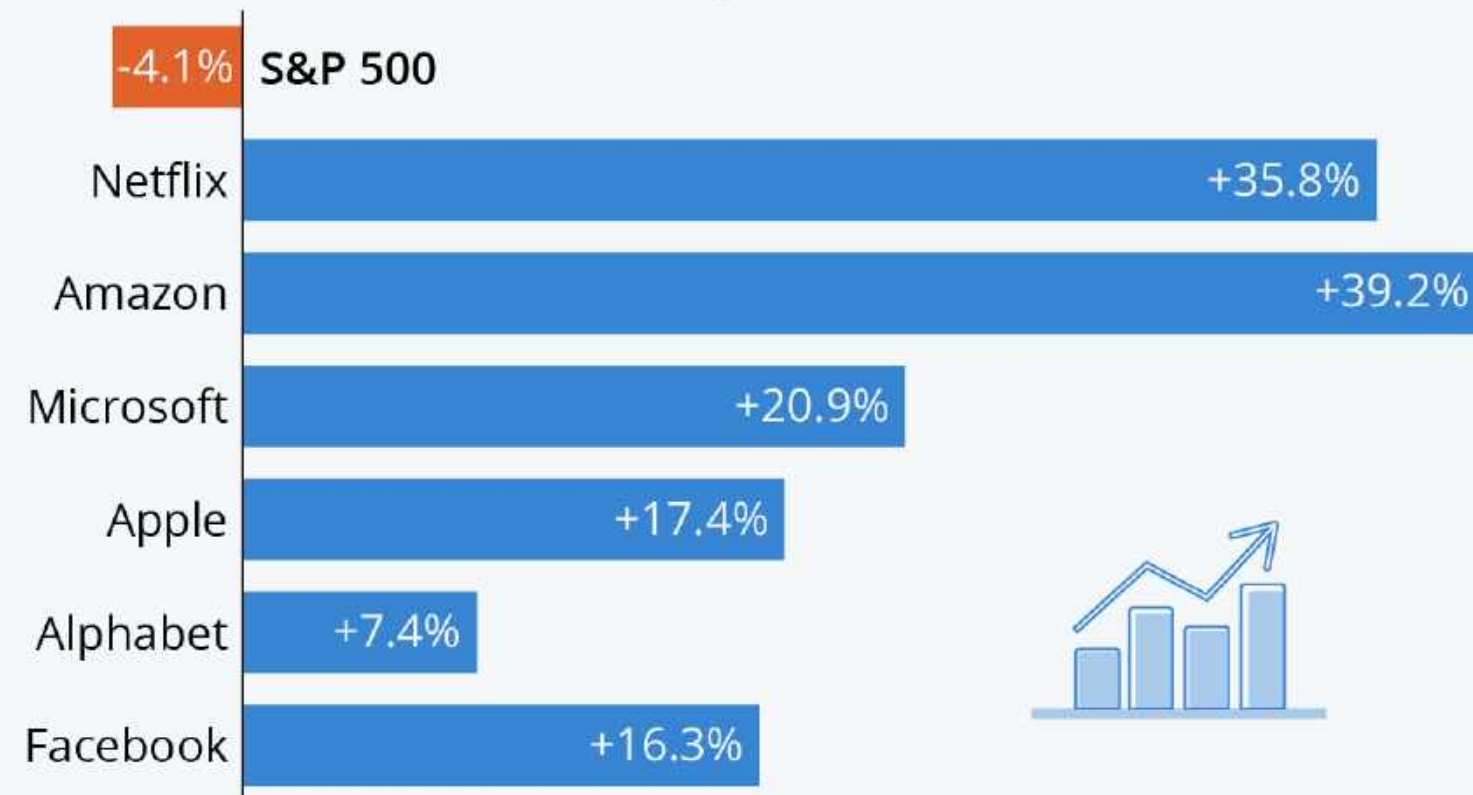
**& monopolistic  
tendencies**

**based on AI-Lockin-Loop**

# Winners & Losers

# Top Tech Stocks Weather the Storm

Percent change in stock price for the S&P 500  
and select tech companies in 2020



As of midday June 17  
Source: Yahoo Finance



statista

# Price Change - First Half 2020:

**Amazon(42.9%)**

**Apple(24.2%)**

**Microsoft(29.0%)**

# Price Change - First Half 2020

**Boeing: -43.7%**

**Expedia: -24%**

**Delta Air Lines: -47.5%**

**United Airlines: -55.4%**



# Price Change - First Half 2020

**Zoom; 272.6%**

**Tesla: 158.1%**

**Nvidia: 61.5%**

코로나

COVID-19

Pandemic

The screenshot shows the top portion of a web browser displaying a news article from The New York Times. The page has a white background with a blue header area. At the top left, there is a hamburger menu icon. The main header reads "The New York Times" in a classic serif font. Below this, a navigation bar features "The Coronavirus Outbreak >" on the left, followed by a red "LIVE" badge, and then several menu items: "Latest Updates", "Maps and Cases", "Reopenings by State", "Reopenings Halted", and "Four Families Fight Back". The main content area has a large, bold, italicized title: "When Will the Pandemic End? And How?". Below the title is a paragraph of text: "The infection has now penetrated the White House, where two aides have tested positive. Unemployment could climb above 20 percent. And states are grappling with when and how to reopen." At the bottom of the article preview, there is a line of text: "Published May 10, 2020 Updated May 19, 2020". To the right of this text are four circular icons for social media sharing: Facebook, Twitter, Email, and a general share icon.

☰

The New York Times

The Coronavirus Outbreak > **LIVE** Latest Updates Maps and Cases Reopenings by State Reopenings Halted Four Families Fight Back

## *When Will the Pandemic End? And How?*

The infection has now penetrated the White House, where two aides have tested positive. Unemployment could climb above 20 percent. And states are grappling with when and how to reopen.

Published May 10, 2020 Updated May 19, 2020

f t e ↗

# NEWS

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World Africa Australia Europe Latin America Middle East More

## Coronavirus: German outbreak sparks fresh local lockdowns

23 June 2020

f WhatsApp Twitter Email Share

Coronavirus pandemic



Authorities have sent supplies to the quarantined workers of the Tönnies meatpacking plant

German authorities in the state of North Rhine-Westphalia have reimposed lockdown restrictions in two districts after a spike in cases, with more than half a million people affected.



One area is home to a meatpacking plant where more than 1,500

### Coronavirus Live Updates

THE CORONAVIRUS CRISIS

## After Weeks Of No New Cases Of COVID-19 In New Zealand, 2 Arrivals Test Positive

June 16, 2020 · 1:48 PM ET

 LAUREL WAMSLEY 



NEW ZEALAND

## Two cases of COVID-19 in New Zealand represent 'unacceptable failure of the system,' says PM

& Euronews · 17/06/2020



A windsurfer reels in his kite at New Brighton Beach in Christchurch, New Zealand, Tuesday, June 9, 2020. -Copyright Mark Baker/AP Photo

New Zealand recorded two new coronavirus cases after three weeks of no cases, in a situation the prime minister called "an unacceptable failure of the system".

The two women, family members and New Zealand citizens, had travelled from the United Kingdom and were in a managed isolation facility in Auckland upon arrival.

Atlanta  
**JEWISH TIMES**  
ISRAEL / NEWS

Israel Faces Spike in New Cases of COVID-19

# Israel Faces Spike in New Cases of COVID-19

Most new cases are being diagnosed in schools that had reopened after being shut for more than two months.

By **JAN JABEN-EILON**  
June 12, 2020, 7:14 am | 0

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Prime Minister Benjamin Netanyahu said the coronavirus "is not affected at all by the climate."

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**Coronavirus outbreak**  
Global report: South Korea has Covid-19 second wave as Israel ponders new lockdown

**New infections in and around Seoul; Spain reports 36 new outbreaks; New Zealand strengthens borders**

- [Coronavirus - latest updates](#)
- [See all our coronavirus coverage](#)

**Sam Jones and Charles Anderson in Nelson**

Mon 22 Jun 2020 15:38 BST

BBC News Sport Reel More Search

# NEWS

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Asia China India

## Coronavirus: South Korea confirms second wave of infections

22 June 2020

Facebook Messenger Twitter Email Share

Coronavirus pandemic

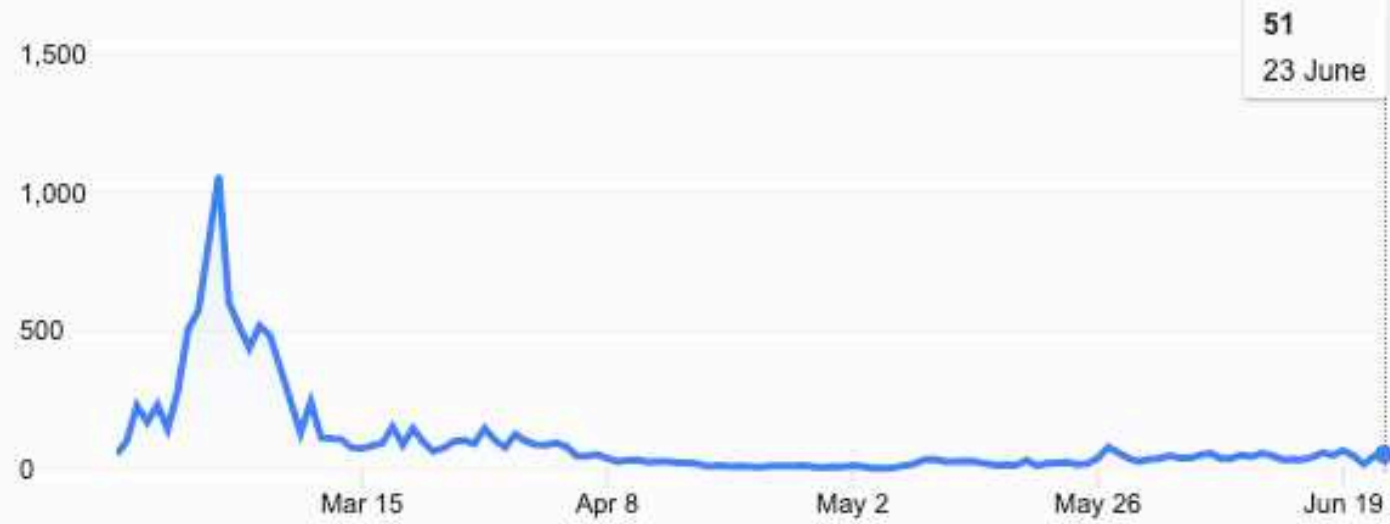


### Daily change

New cases ▾

South Korea ▾

All time ▾



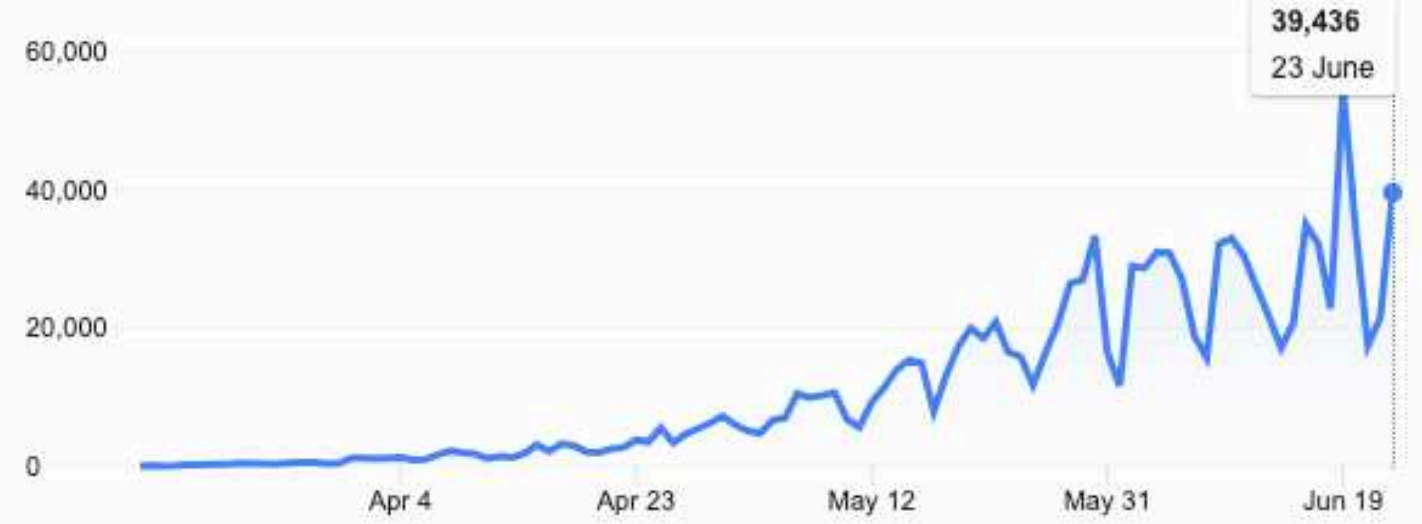
Each day shows new cases reported since the previous day · Updated less than 30 mins ago ·  
Source: [Wikipedia](#) · [About this data](#)

### Daily change

New cases ▾

Brazil ▾

All time ▾



Each day shows new cases reported since the previous day · Updated less than 30 mins ago ·  
Source: [Wikipedia](#) · [About this data](#)



# Fear & Dread



**fear: [일반적인 공포, 두려움]을 의미**

**dread: 마주하고 싶지 않은,**

**그러나 [마주해야하는 구체적 공포, 두려움]**

**in uncertain times**

**불확실의 시대**

# Sharp discontinuities

Before Corona

**After Corona**

Post-Corona

# a cliché

# Fear

# & Dread

We start to see  
our fellow human  
as *a potential enemy*



# Fear

# & Dread

# The Stress of Lockdown

**It's not just the virus**

**we fear**

but *the future itself.*

seeing the future

not as a promise

but as a threat

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☰

The New York Times

The Coronavirus Outbreak > **LIVE** Latest Updates Maps and Cases Reopenings by State Reopenings Halted Four Families Fight Back

## *When Will the Pandemic End? And How?*

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Published May 10, 2020 Updated May 19, 2020

f t e ↗

# climate crisis?

# machine crisis?



# AI-Impact on Productivity

The screenshot shows a PwC Global article page. The header includes the PwC logo, 'Global', a search icon, 'Share', a location pin icon, and a 'Menu' button. Below the header, there are links for 'My account' and 'My Lists'. The main content area has a red background with white text. The title is 'AI to drive GDP gains of \$15.7 trillion with productivity, personalisation improvements'. Below the title, there is a star icon and the date '27 June, 2017'. The article content includes two bullet points: 'Global GDP will be 14% higher in 2030 as a result of AI' and 'Productivity improvements are expected to account for half of all gains to 2030'.

pwc | Global

Search Share Location Menu

My account My Lists

## AI to drive GDP gains of \$15.7 trillion with productivity, personalisation improvements

☆ 27 June, 2017

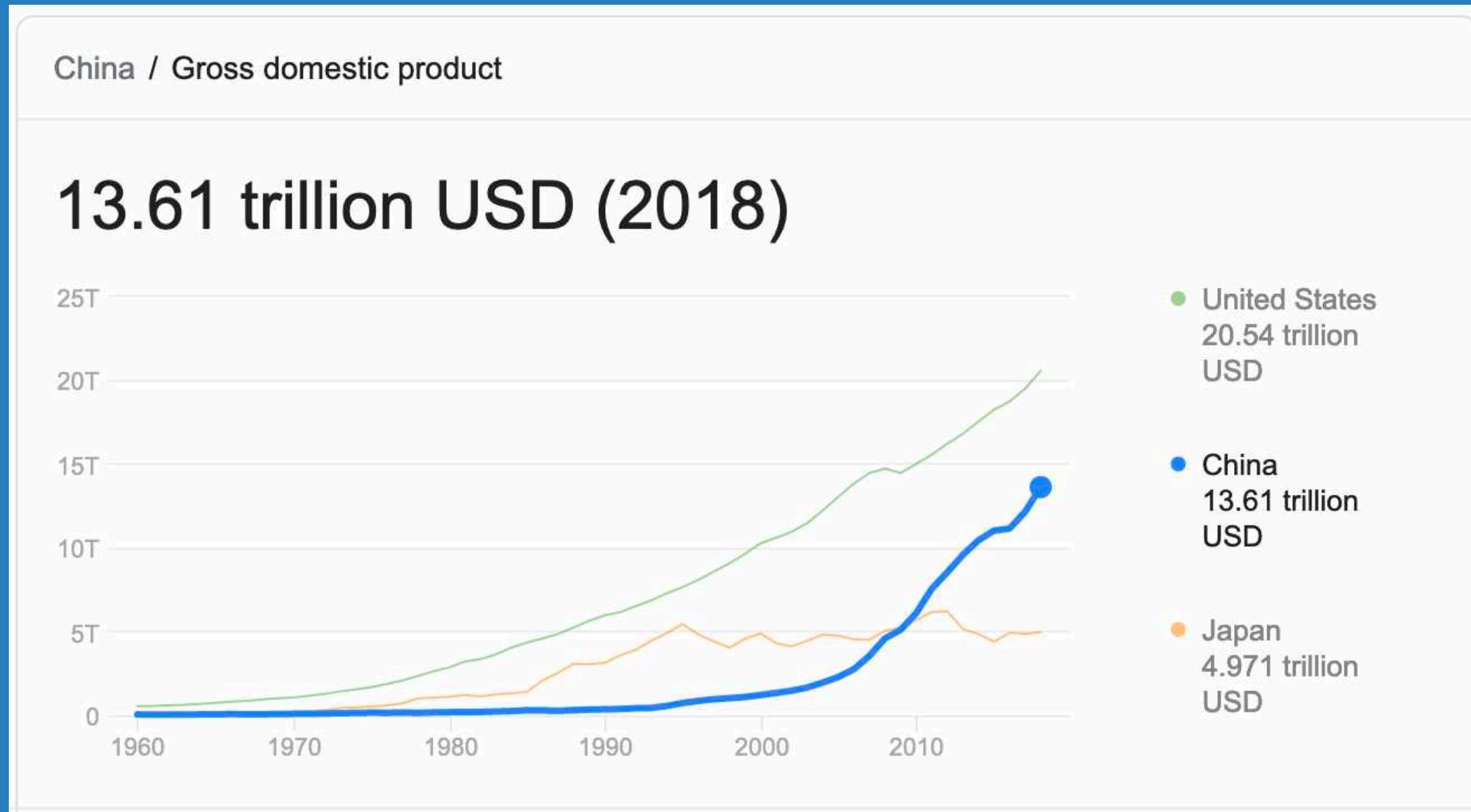
- Global GDP will be 14% higher in 2030 as a result of AI
- Productivity improvements are expected to account for half of all gains to 2030

# \$13trn



Nevertheless, at the global average level of adoption and absorption implied by our simulation, AI has the potential to deliver additional global economic activity of around ~~\$13 trillion~~ **\$13 trillion** by 2030, or about 16 percent higher cumulative GDP compared ~~with today~~ **with today**. This amounts to 1.2 percent additional GDP growth per year. If delivered, this impact would compare well with that of other general-purpose technologies through history.

# \$13trn? = nearly China's GDP



# AI-Impact = Fire or Electricity


**Vox** **recode**

## Google CEO Sundar Pichai says AI is more profound than electricity and fire

How dangerous is fire or AI?

By **Theodore Schleifer** | @teddyschleifer | Jan 19, 2018, 4:38pm EST

f t SHARE



Google CEO Sundar Pichai | MSNBC / Kim White

**Is AI really  
a world changing  
technology?**

**Will AI**

**have**

**a world-altering**

**impact?**

**AI = machine learning**

**have made**

**much progress.**

**in the early 2010s**

**recognizing patterns in  
data**

**(images, speech, etc.)**



**improved algorithms**

**more powerful computers**

**more data**

**powerful**

**pattern-recognition**

**tools**

# AI

= a general-purpose

= technology

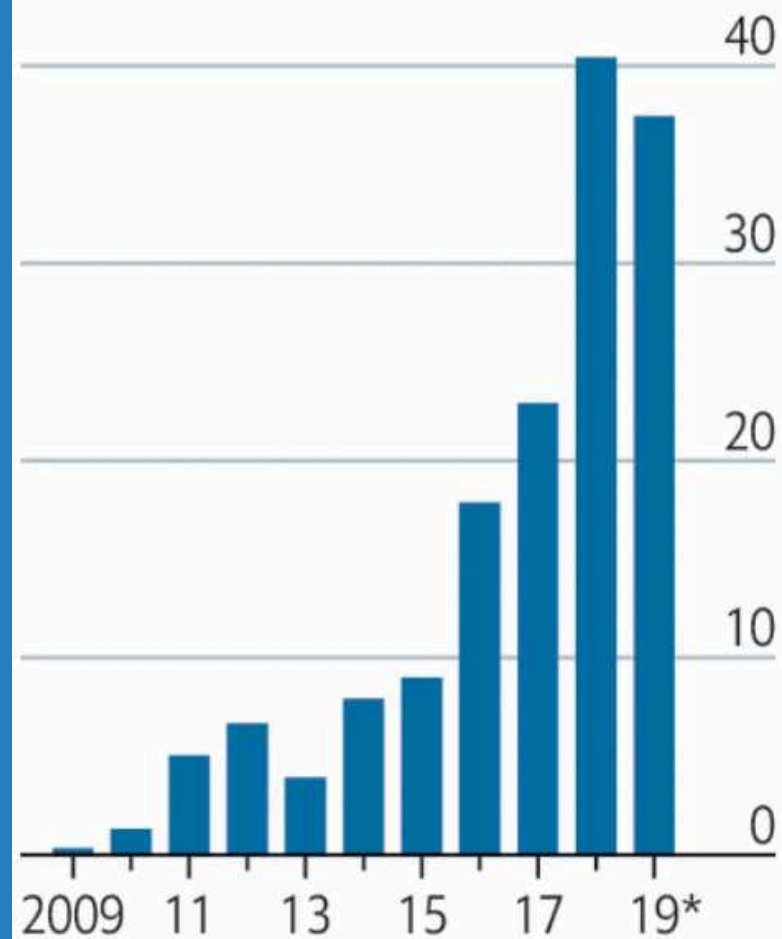
**affecting**

**entire economies**

## On the up

Worldwide

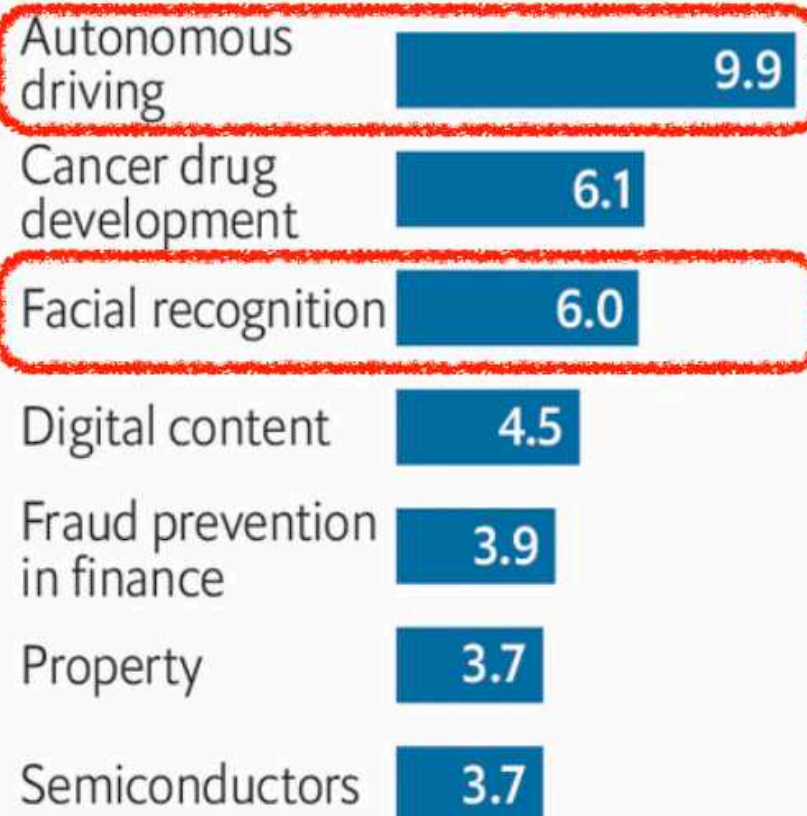
Total private investment in AI  
\$bn



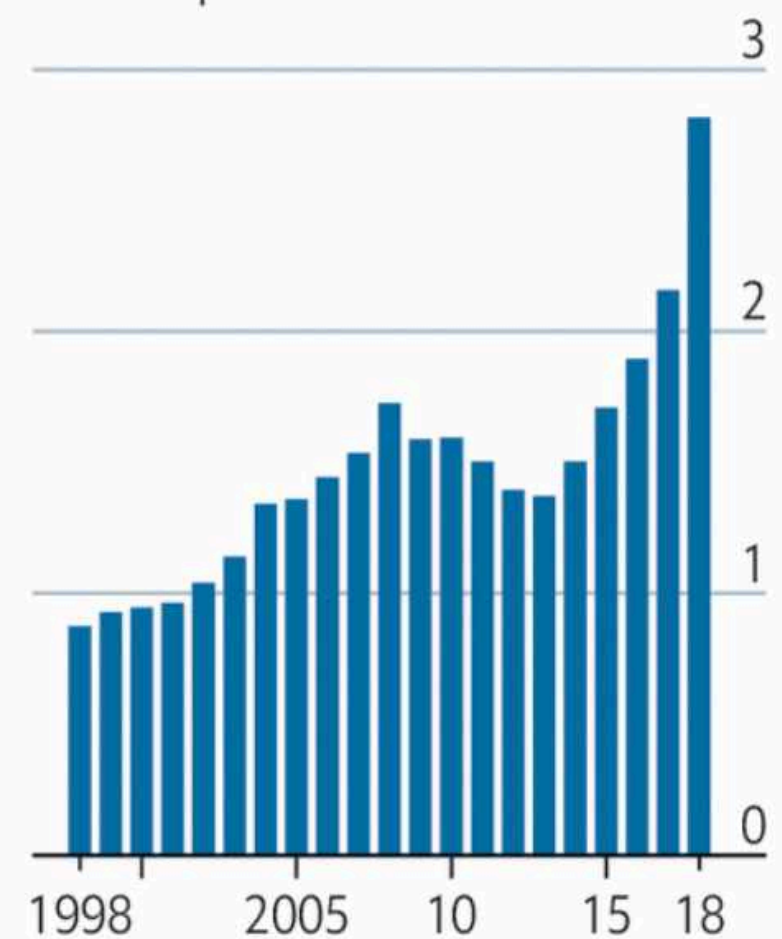
Source: Stanford Institute for Human-Centred Artificial Intelligence

The Economist

Private investment in AI, 2018-19  
By sector, % of total

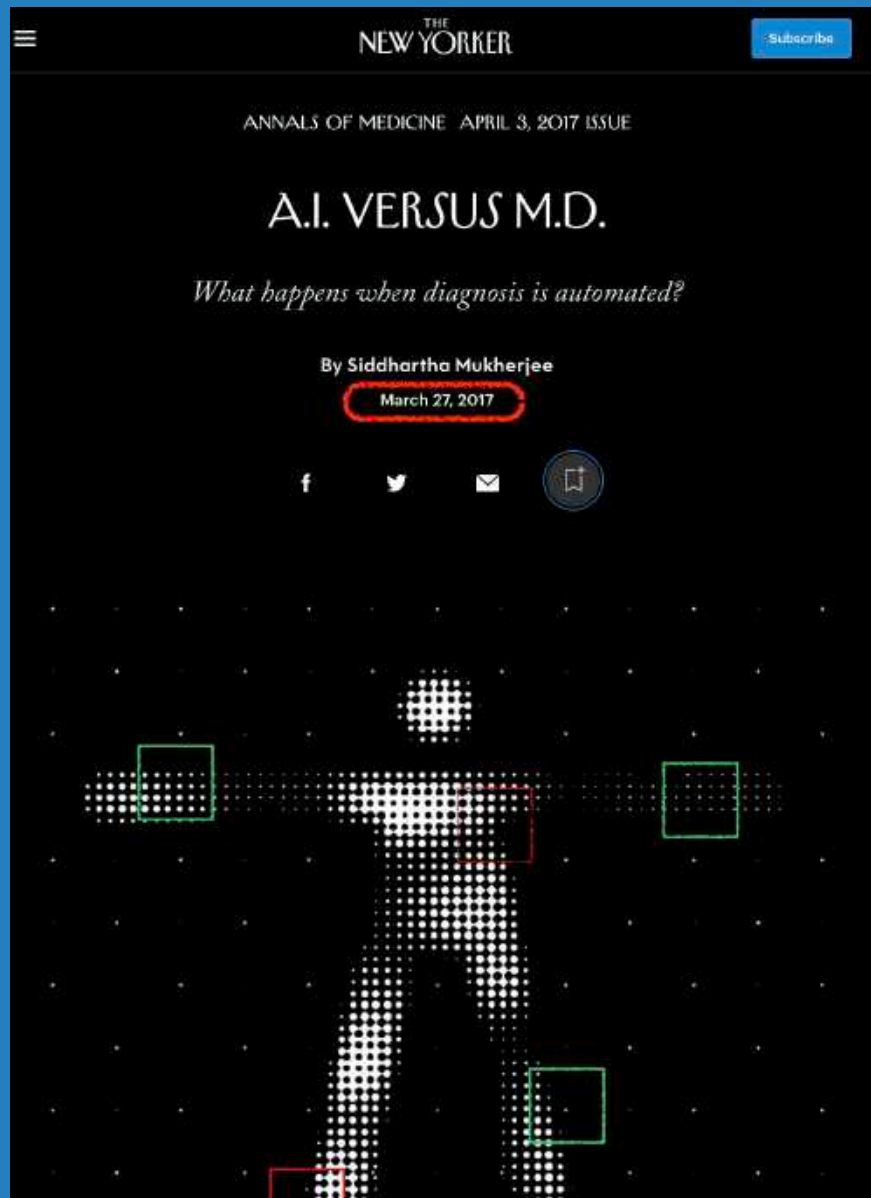


AI papers published  
% of all publications



\*To October

# Geoffrey Hinton: "in five years", "might be ten years" (2017)



Geoffrey Hinton, a computer scientist at the University of Toronto, speaks less gently about the role that learning machines will play in clinical medicine. Hinton—the great-great-grandson of George Boole, whose Boolean algebra is a keystone of digital computing—has sometimes been called the father of deep learning; it’s a topic he’s worked on since the mid-nineteen-seventies, and many of his students have become principal architects of the field today.

“I think that if you work as a radiologist you are like Wile E. Coyote in the cartoon,” Hinton told me. “You’re already over the edge of the cliff, but you haven’t yet looked down. There’s no ground underneath.” Deep-learning systems for breast and heart imaging have already been developed commercially. “It’s just completely obvious that in five years deep learning is going to do better than radiologists,” he went on. “It might be ten years. I said this at a hospital. It did not go down too well.”

Hinton’s actual words, in that hospital talk, were blunt: “They should stop training radiologists now.” When I brought up the challenge to Angela Lignelli-Dipple, she pointed out that diagnostic radiologists aren’t merely engaged in yes-no classification. They’re not just locating the embolism that brought on a stroke. They’re noticing the small bleed elsewhere that might make it disastrous to use a clot-busting drug; they’re picking up on an unexpected, maybe still asymptomatic tumor.

# medical diagnosis?

NEWS · 20 FEBRUARY 2020

# Powerful antibiotics discovered using AI

Machine learning spots molecules that work even against 'untreatable' strains of bacteria.

Jo Marchant







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Review Article | Published: 07 January 2019

# High-performance medicine: the convergence of human and artificial intelligence

Eric J. Topol

*Nature Medicine* 25, 44–56(2019) | [Cite this article](#)

147k Accesses | 389 Citations | 2528 Altmetric | [Metrics](#)

# Corona

# Covid-19

**by hand**

**with telephone calls**

**with shoe leather**

# Workers replaced by robots?

Forbes

8,035 views | Nov 24, 2019, 01:00am EST

## Is AI A Job Killer Or Job Creator?



Kathleen Walch Contributor

COGNITIVE WORLD Contributor Group ⓘ

AI



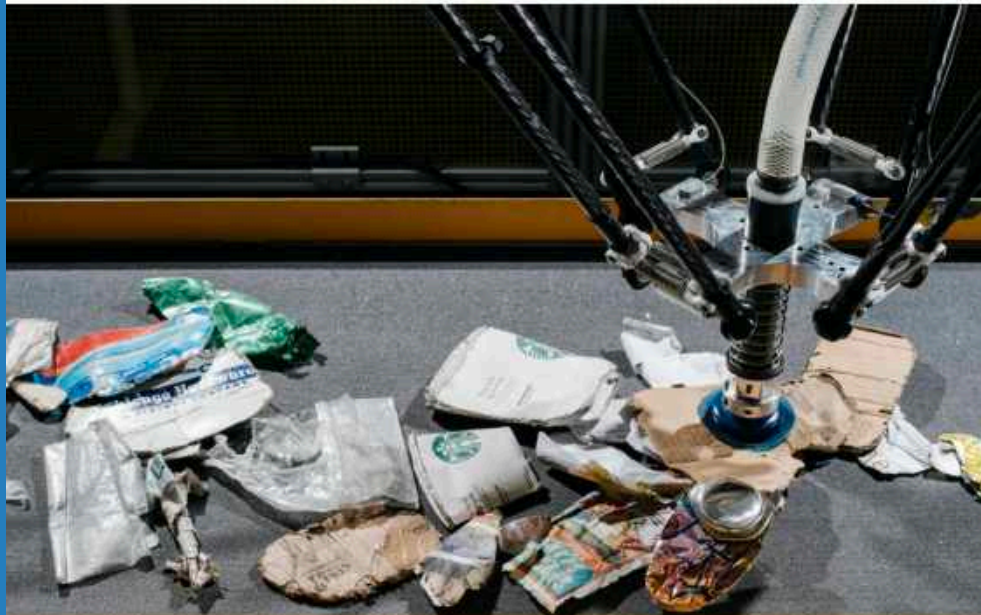
AI brings mixed emotions and opinions when referenced in the context of jobs. If you ask the question “Do you think Artificial Intelligence will be a net job killer or net job creator?” to colleagues, friends, or strangers you’re bound to get some very strong opinions on this subject.

The New York Times

The Coronavirus Outbreak > **LIVE** Latest Updates Maps and Cases Reopenings by State Reopenings Halted Four Families

## Robots Welcome to Take Over, as Pandemic Accelerates Automation

Broad unease about losing jobs to machines could dissipate as people focus on the benefits of minimizing close human contact.



An AMP Robotics system sorting recyclable material at the company's lab in Louisville, Colo. Benjamin Rasmussen for The New York Times

By Michael Corkery and David Gelles


April 10, 2020

87

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Money ▶ Property Pensions Savings Borrowing Careers More



**Coronavirus outbreak**

This article is more than 2 months old

## Bosses speed up automation as virus keeps workers home

**Livelihoods at risk as EY finds 41% of employers globally prepare for after the crisis**

PA Media

Mon 30 Mar 2020 00.01 BST

# a wave of unemployment

Pew Research Center

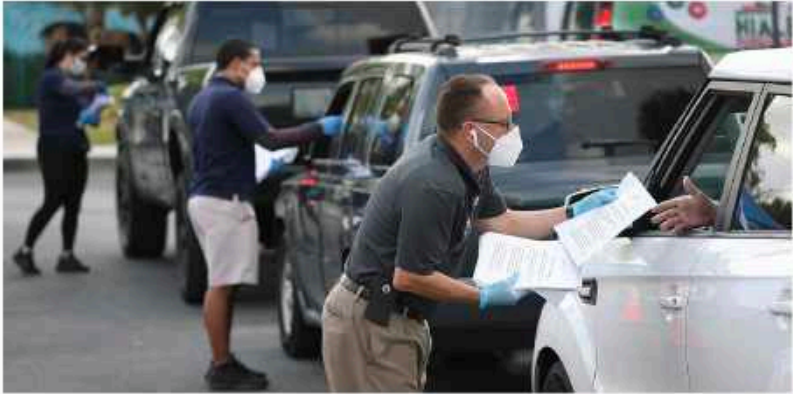
FACTANK  
NEWS IN THE NUMBERS

SEE ALL CORONAVIRUS RESEARCH >

JUNE 11, 2020

Unemployment rose higher in three months of COVID-19 than it did in two years of the Great Recession

BY RAKESH KOCHHAR



City employees hand out unemployment applications on April 8, 2020, in Hialeah, Florida. (Joe Raedle/Getty Images)

The COVID-19 outbreak and the economic downturn it engendered swelled the ranks of unemployed Americans by more than 14 million, from 6.2 million in February to 20.5 million in May 2020. As a result, the U.S. unemployment rate shot up from 3.8% in February – among the lowest on record in the post-World War II era – to 13.0% in May. That rate was the era's second highest, trailing only the level reached in April (14.4%).

**automation technologies**

**accelerated**

**based on AI-Technology**

**automation technologies**  
**aimed at reducing labor**  
**by substituting**  
**cheaper capital**



**displaced**

**workers**

# Displacement

# Effect

# Lilly Irani

“Automation doesn't  
replace labor. (...)

It displaces it.”

**automation technologies**

**enabled the creation of**

***new tasks***

# Reinstatement

# Effect

# Mixed effects

# on labor demand!

# *the future of work?*

**a race between**

**automation and**

**new,**

**labor-intensive tasks**



**task content of  
production**

**displacement effect**

**reinstatement effect**

**market failures**

**counterbalancing policies**

# Self-driving cars

**Where's**

**my self-driving car?**

# Is the AV Technology Around the Corner?



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## Driverless Cars Are 90% Here. Another 90% Is Left to Go.

If building a robo-car were just about putting the parts together, we'd be living in the future already



General Motors has begun testing fully autonomous vehicles on public roads in Michigan, starting with roads nearby its Technical Center in Warren.

PHOTO: GENERAL MOTORS



By *John D. Stoll*

May 24, 2019 1:02 pm ET

**Sacha Arnoud, Director of Engineering (Waymo)  
(2018.2)**

**“When you’re 90% done, you still  
have 90% to go,”**

**The first “90% of the technology  
takes 10% of the time.”**

# Risk 1

## Lane Change

GM, once the no. 1 car company in the world, needs to shift focus from being the biggest seller to the biggest spender if autonomous cars are ever going to become mainstream.

## Percentage of GM revenue spent on R&D and CapEx



Source: the company



# Risk 2: safe “islands” around cities



THE **ROBOTREPORT**  
EXPLORING THE BUSINESS AND APPLICATIONS OF ROBOTICS

## Gatik turns right on middle-mile approach to autonomy


By Steve Crowe | May 8, 2020

f t in e p +



**Gatik's Level 4 autonomous box trucks are already making middle-mile deliveries for Walmart. | Credit: Gatik**

THE **ROBOTREPORT**  
EXPLORING THE BUSINESS AND APPLICATIONS OF ROBOTICS



**Founded in 2017, Gatik launched a commercial service with Walmart in July 2019. | Credit: Gatik**

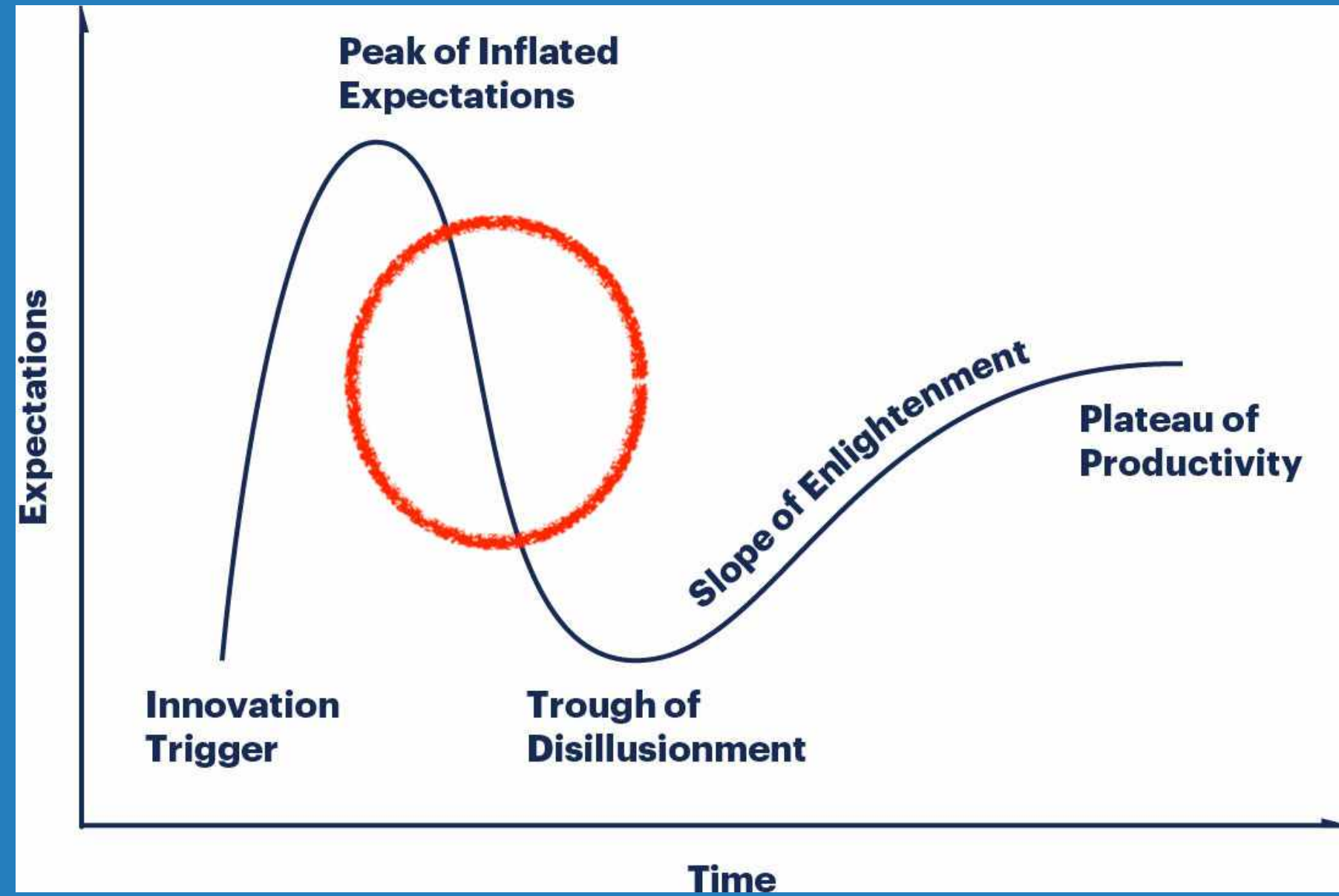
"Internally we track a better metric: days between intervention," he said. "I can't share that number, but we classify the disengagement as passive or aggressive. Decision-making and planning is where we spend most of our time. Decision-making is why we don't see self-driving cars at scale with nobody on board. Our approach is tied to the use-case we're going after. Our policy is learning first. We use deep learning and cross-check the decisions with classic robotics techniques."

### A gap in the market

Gatik's revenue is in the "millions per year," according to Gatik. This would be atypical for the autonomous vehicle industry at the moment. Narang said Gatik has "long-term contracts with sizable customers." Besides Walmart, its autonomous vehicles serve multiple

"The state of AI hype  
has far exceeded  
the state of AI science,

# the Hype Cycle of Gartner



# Face Recognition

## Many Facial-Recognition Systems Are Biased, Says U.S. Study

Algorithms falsely identified African-American and Asian faces 10 to 100 times more than Caucasian faces, researchers for the National Institute of Standards and Technology found.



Morning at Grand Central Terminal. Technology for facial recognition is frequently biased, a new study confirmed. Timothy A. Clary/Agence France-Presse — Getty Images

By Natasha Singer and Cade Metz

Dec. 19, 2019





# Facial Recognition Is Accurate, if You're a White Guy

By Steve Lohr

Feb. 9, 2018



Facial recognition technology is improving by leaps and bounds. Some commercial software can now tell the gender of a person in a photograph.

When the person in the photo is a white man, the software is right 99 percent of the time.



# Many Facial-Recognition Systems Are Biased, Says U.S. Study

Algorithms falsely identified African-American and Asian faces 10 to 100 times more than Caucasian faces, researchers for the National Institute of Standards and Technology found.



Morning at Grand Central Terminal. Technology for facial recognition is frequently biased, a new study confirmed. Timothy A. Clary/Agence France-Presse — Getty Images

By Natasha Singer and Cade Metz

Dec. 19, 2019



# Black Lives Matter


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Jun 8, 2020 - Technology

## IBM is exiting the face recognition business

Ina Fried, author of [Login](#)

f    t    in    e



IBM CEO Arvind Krishna. Photo: IBM



## Amazon Pauses Police Use of Its Facial Recognition Software

The company said it hoped the moratorium “might give Congress enough time to put in place appropriate rules” for the technology.



Civil liberties advocates began calling for a ban on the use of facial recognition by law enforcement in 2018. Elaine Thompson/Associated Press

By Karen Weise and Natasha Singer

June 10, 2020



# Microsoft president calls for federal regulation of facial recognition technology

By [Clare Duffy](#), [CNN Business](#)

Updated 2205 GMT (0605 HKT) June 18, 2020





## SOFTWARE IDENTIFIES SUSPECT

THE ORLANDO SENTINEL

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SEPTEMBER 15, 2004

**S**T. PETERSBURG -- A Pinellas County deputy used facial-recognition software to identify a woman who used a fake name, leading to the first local arrest made with the new technology.

# The Secretive Company That Might End Privacy as We Know It

A little-known start-up helps law enforcement match photos of unknown people to their online images — and “might lead to a dystopian future or something,” a backer says.

By [Kashmir Hill](#)

Published Jan. 18, 2020 Updated Feb. 10, 2020



[Leer en español](#)

Until recently, Hoan Ton-That’s greatest hits included an obscure iPhone game and an app that let people put Donald Trump’s distinctive yellow hair on their own photos.

Then Mr. Ton-That — an Australian techie and onetime model — did something momentous: He invented a tool that could end your ability to walk down the street anonymously, and provided it to hundreds of law enforcement agencies, ranging from local cops in Florida to the F.B.I. and the Department of Homeland Security.

His tiny company, [Clearview AI](#), devised a groundbreaking facial

NEC Understanding a brighter world

Home > Products & Solutions > Biometric Authentication > Face Recognition > NeoFace Watch

## NeoFace Watch

Menu

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LAW ENFORCEMENT  
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## The trusted face recognition company since 2002

Fighting crime and curtailing human bias

Face recognition technology has proven an imperative tool

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**China**

This article is more than **2 years old**

## China testing facial-recognition surveillance system in Xinjiang - report

System alerts authorities when suspects on watchlist stray from their home or workplace

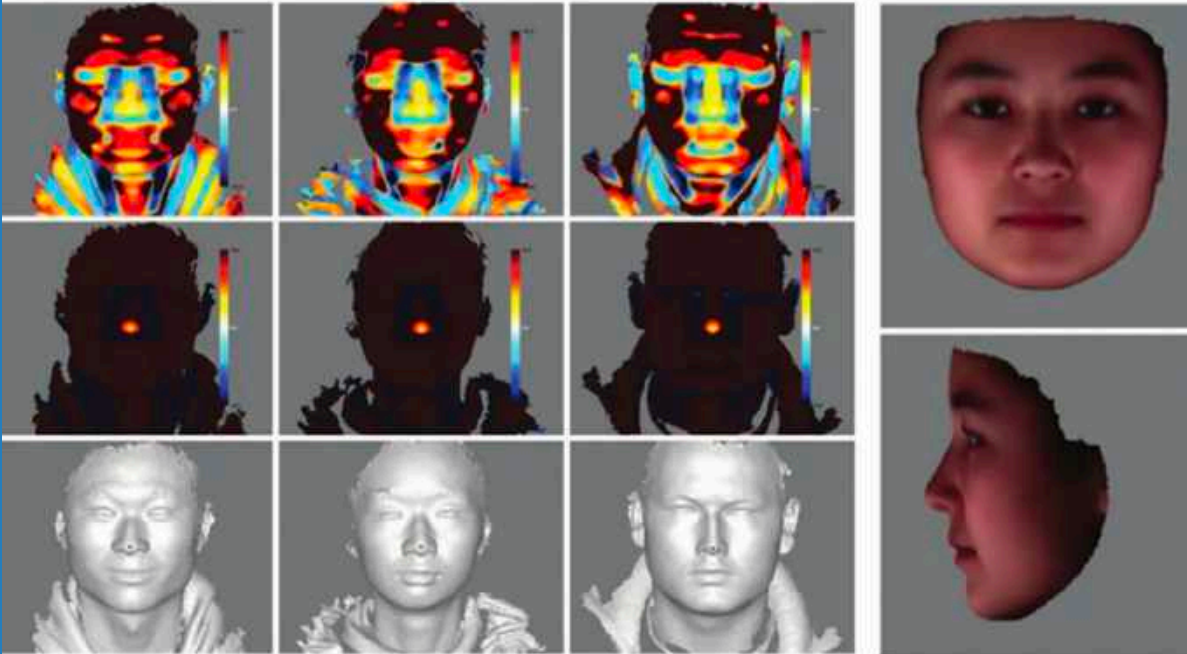
**Tom Phillips in Beijing**

Thu 18 Jan 2018 08:16 GMT

The New York Times

## China Uses DNA to Map Faces, With Help From the West

Beijing's pursuit of control over a Muslim ethnic group pushes the rules of science and raises questions about consent.



Images from a study in 2013 on 3-D human facial images. BMC Bioinformatics

By Sui-Lee Wee and Paul Mozur

Published Dec. 3, 2019 Updated Dec. 10, 2019

f t 332

AI has been

**far more successful!**

# electricity

# in the 20th century



**the cloud**

**in the 21st century**

# AI's potential?!

the effect  
of *slowing*  
its adoption

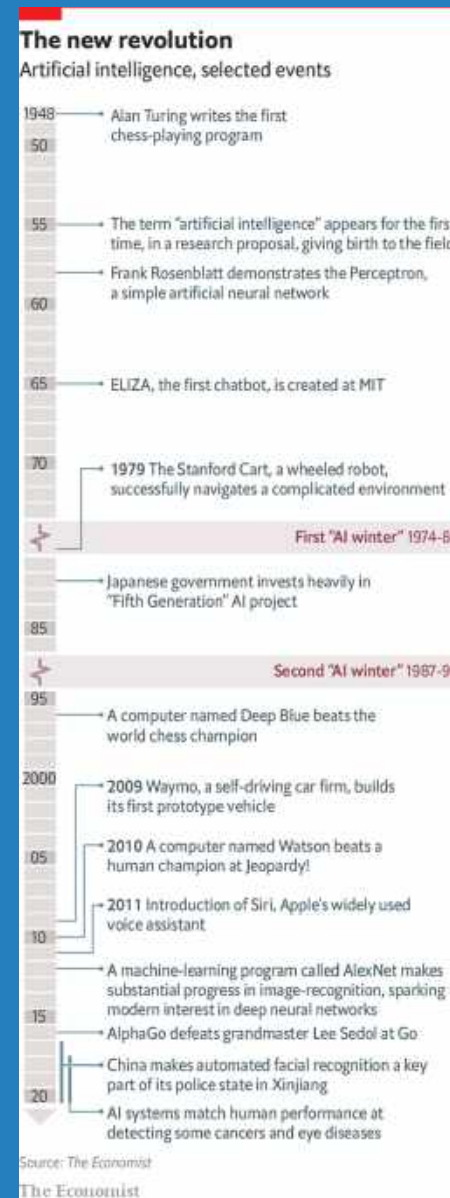
# idiot savant

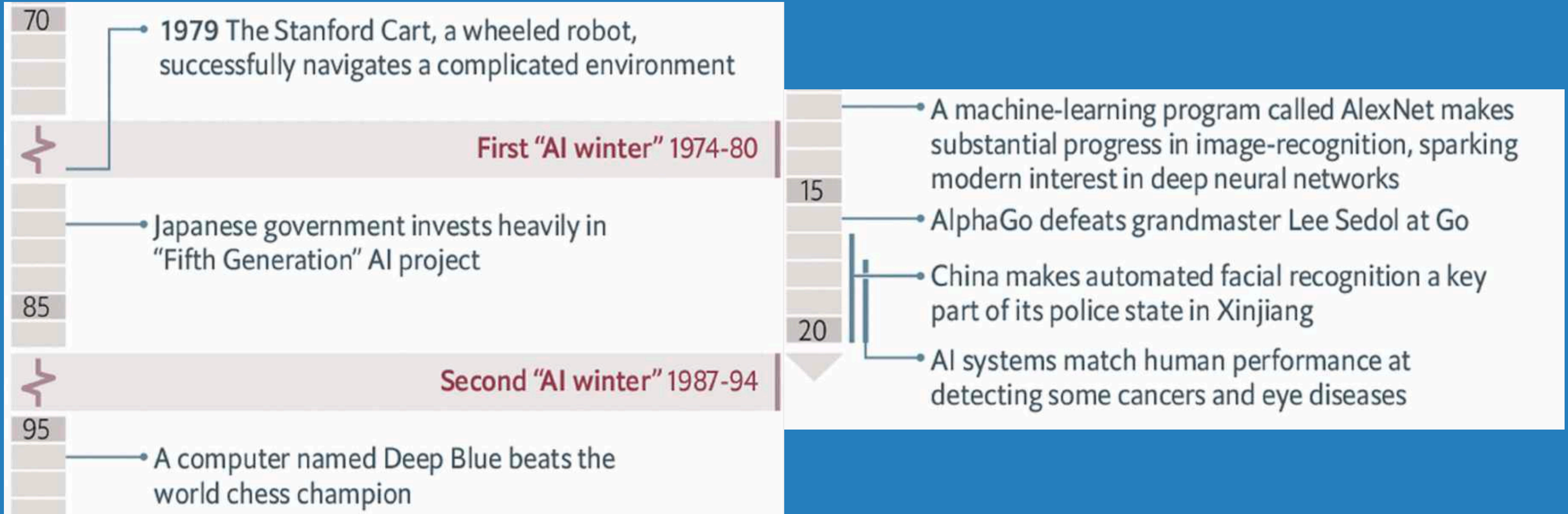
# The AI Technology

# need

# another breakthrough!

# AI Winter





# AI summer



**warmer**

**& brighter**

# AI-Traps

**NOT:**

**AI winter is**

**coming again!**

**BUT**

**an autumnal breeze**

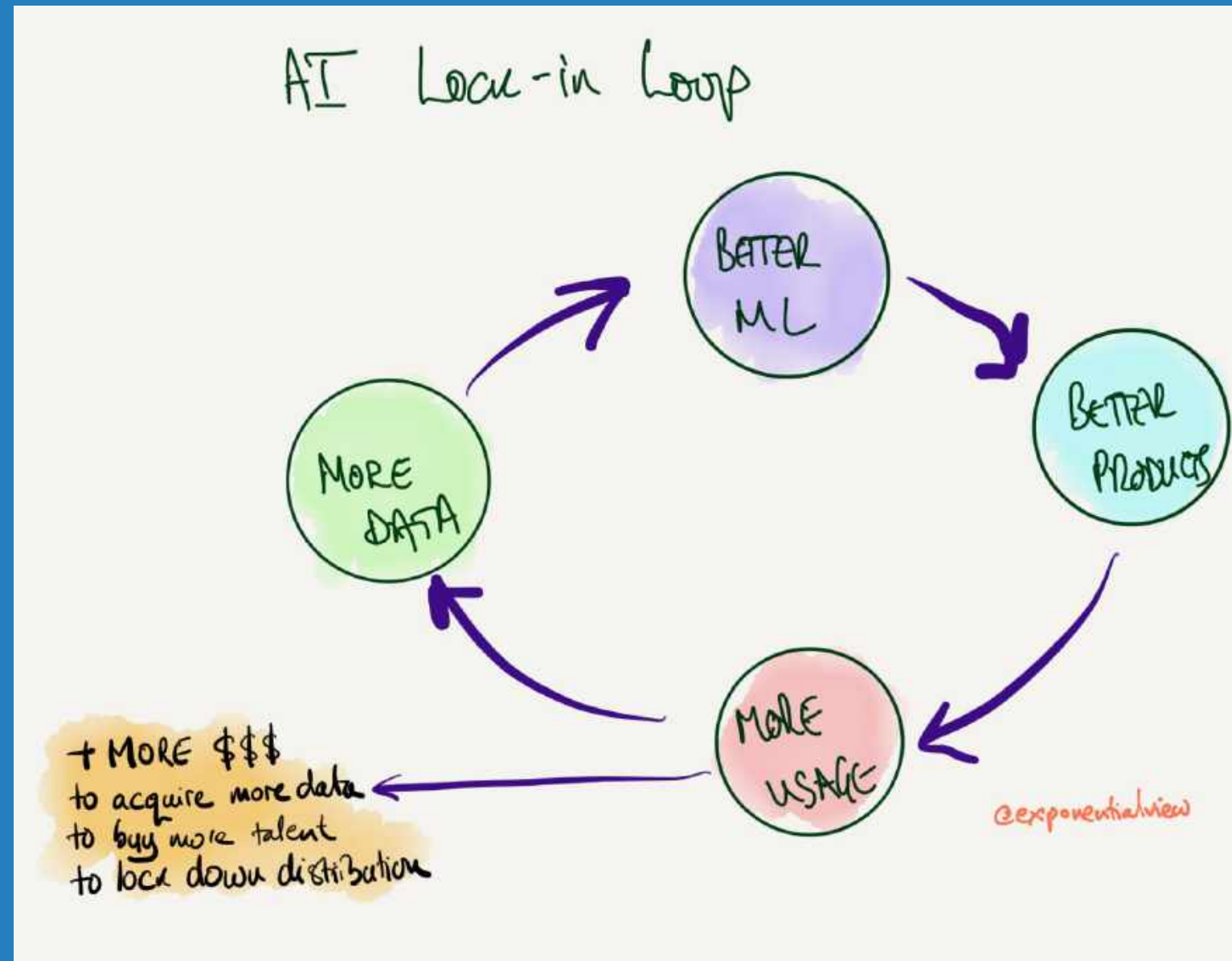
**“When you’re 90% done,  
you still have 90% to go,”**

# Risk 3:

# Platform-Monopoly

# Monopsony

# AI-Lockin-Loop





# Network Effects

▶ **better Services**

▶ **Market Power**

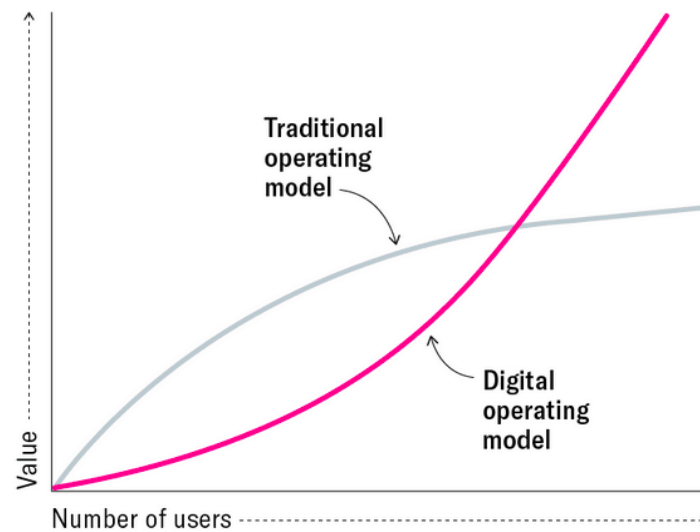
▶ **economies of scale**

# abuse of market power

# the best (not good enough)

## How AI-Driven Companies Can Outstrip Traditional Firms

The value that scale delivers eventually tapers off in traditional operating models, but in digital operating models, it can climb much higher.



From: "Competing in the Age of AI," by Marco Iansiti and Karim R. Lakhani, January-February 2020

HBR

The regionality

**lost almost**

all of its relevance.

# vertical integration

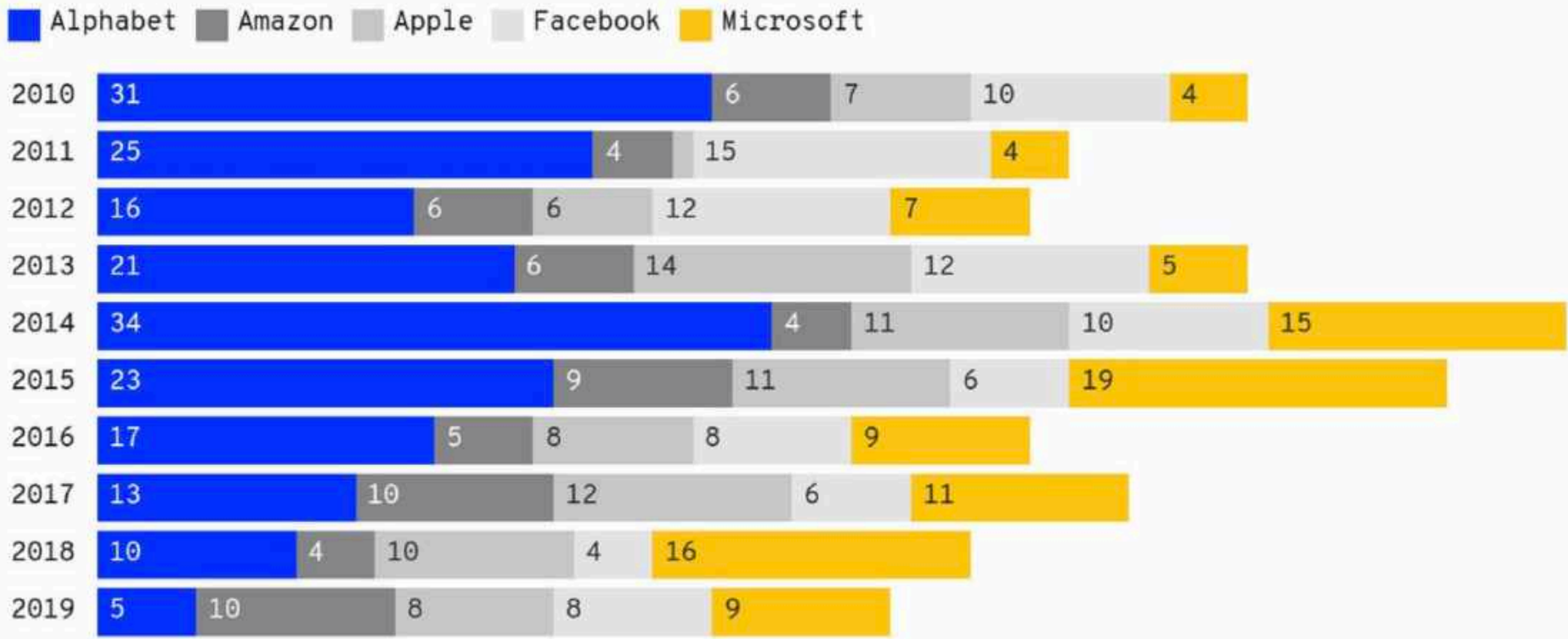
# Expanding horizontally

**acqui-hire**

**competition reduced**

# acquisitions

## Tech company acquisitions since 2010



Number of acquisitions per year  
Chart: Protocol • Source: Pitchbook

protocol

The five tech giants have collectively acquired more than 500 companies since 2010.



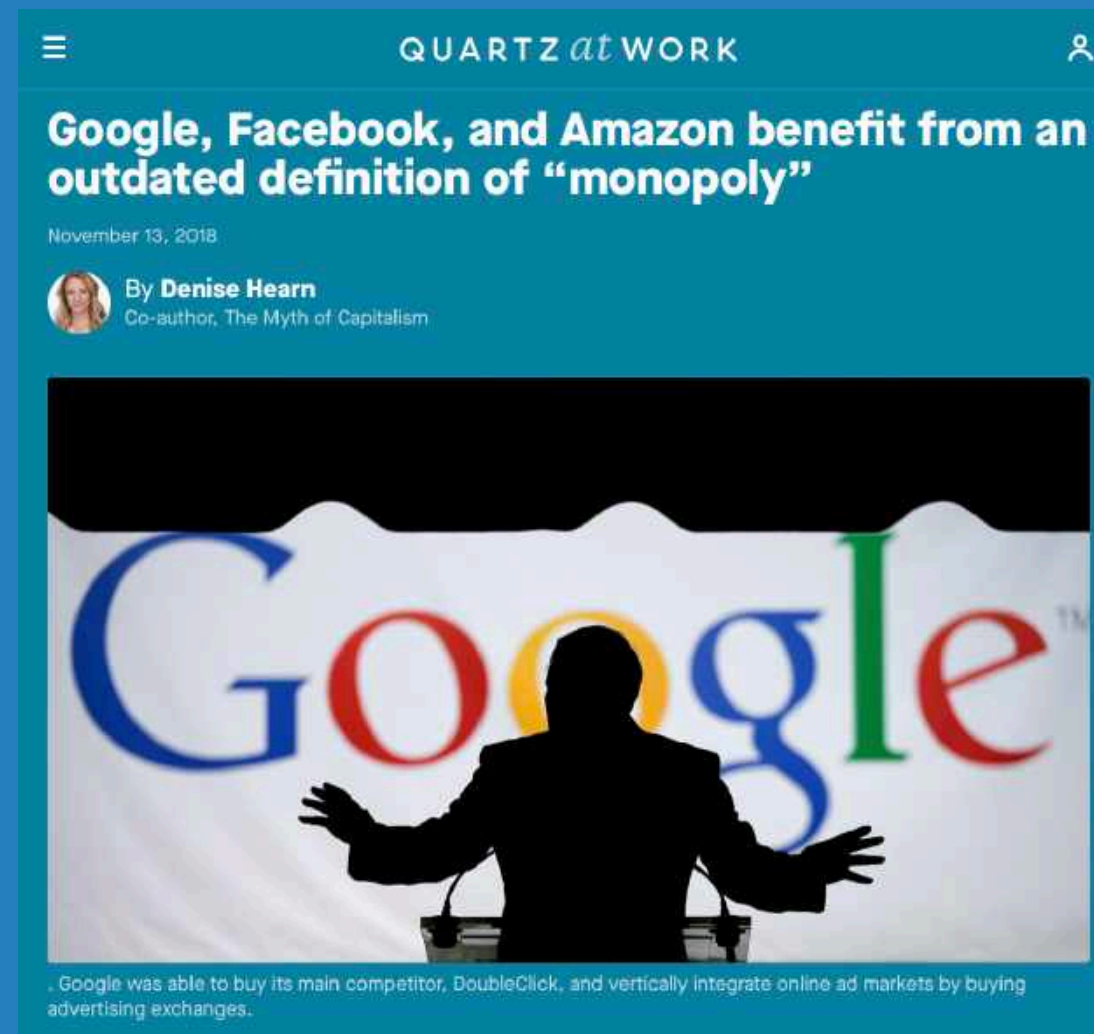
# The concentration of big tech

# MAFAAs

**Microsoft, Apple, Facebook,**

**Amazon and Alphabet**

# outdated definition of monopoly



**consumer welfare**

**low prices**

# Q: a new competition?

# 2 recommendations

# 1. no acquisition

**WhatsApp, Instagram**

# 2. Exclusivity clauses



**We need a broad discussion  
about economies of scale &  
network effects  
of the digital economy.**