AI SUMMIT 2020 SEOUL

Market Transformation Through AI Startups

Gleb Chuvpilo
December 2020

THUNDERMARK

Thundermark Capital
Gleb Chuvpilo, Managing Partner

Investor

- **Venture Partner @ Peak State Ventures** and **Rewired** (Venture Capital funds).

- **Portfolio Manager @ Clarium Capital** (Peter Thiel's global macro hedge fund).

- **AI-Driven Quantitative Trader @ Goldman Sachs** ($10B market-neutral hedge fund).

Serial Entrepreneur

- **Founding Engineer @ Pager** ($62.6M raised; VCs include NEA & Lux; Partnership with Horizon Health covering 3.8 million patients).

- **Co-Founder & Head of R&D @ Ride** (TPG Growth portfolio company; acquired by Enterprise Holdings in 2016).

- **Co-Founder & CEO @ Authy** (Y Combinator class 2012; acquired by Twilio in 2015).

Scholar

- **MS in Electrical Engineering & Computer Science @ MIT**. Focus: Artificial Intelligence and Robotics.

- **MBA in Finance & Strategic Management @ Wharton**. Focus: Venture Capital Investment Strategy.

- **Chartered Financial Analyst** (**CFA**) & Member of the **New York Society of Security Analysts** (NYSSA).

Researcher

- **Software Engineer @ Palantir Technologies** (built Artificial Intelligence algorithms for Palantir Metropolis).

- **Researcher in AI & Robotics @ MIT Computer Science and Artificial Intelligence Lab** (designed SLAM algorithms for autonomous underwater robots for the US Navy).

- **Researcher in Computational Genomics @ Broad Institute at MIT and Harvard** (with Nick Patterson).
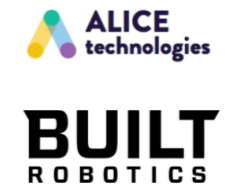
Startup Landscape
Top VC-Backed AI Startups

2020

Healthcare
- RECURSION
- zebra MEDICAL.VISION
- ProteinQure
- iz.ai
- Eko
- Healthy.io
- CYCLICA
- OWKIN
- PAIGE
- Atomwise
- Butterfly Network
- SUBTLE MEDICAL
- Concerto HealthAI

Finance & Insurance
- Comply Advantage
- FEATURE SPACE
- (h[s]) HYPERSCIENCE
- zesty.ai
- Lemonade
- TRACTABLE

Transportation
- GHOST
- isee
- KONUX
- loadsmart
- tusimple
- HOLOMATIC 禾多科技
- Aurora
- voyage

Construction
- ALICE technologies
- BUILT ROBOTICS

Retail & Warehousing
- grabango
- THE YES
- heuritech
- [Sc] STANDARD COGNITION
- OSARO
- FAIRE
- dorabot
- AIFI
- covariant

Govt. & City Planning
- SHIELD AI
- AMP ROBOTICS
- Replica
- Mapillary
- SYNAPSE Technology Corporation

Legal
- lexion

Mining
- razorlabs

Food & Agriculture
- BENSON HILL
- NotCo
- BOWERY

Media & Entertainment
- SECOND SPECTRUM
- FANAI
- Synthesia
- WELLSAID

Education
- 松鼠AI·智适应 Squirrel AI Learning
- KORBIT

Manufacturing
- noodle.ai
- NavVis
- dataprophet machine learning specialists
- CITRINE INFORMATICS

Energy
- BEYOND LIMITS
- INVENIA LABS
- TACHYUS

Telecom
- DEEPSIG
- METAWAVE

Real Estate
- CASPAR

AI 100
CB INSIGHTS

CROSS-INDUSTRY TECH

...essors
- ...IANT
- LIGHTMATTER
- ...CORE
- XANADU
- Kneron

...el Development
- ...AI
- H₂O.ai
- PerceptiLabs
- DataRobot
- dotData

DevOps & Model Monitoring
- ALGORITHMIA
- snyk
- ArthurAI

NLP, NLG, & Computer Vision
- PRIMER
- sherpa.ai
- 创新奇智 AInnovation
- :) Affectiva
- HUGGING FACE

Cybersecurity
- SentinelOne
- OBSIDIAN
- onfido
- ABNORMAL SECURITY
- BLUEHEXAGON

BI & Ops Intel
- climacell
- C3.ai
- falkonry

Sales & CRM
- CRESTA
- integrate.ai
- ZHUIYI 追一科技

Other R&D
- sparkcognition
- KYNDI
- 4Paradigm 第四范式
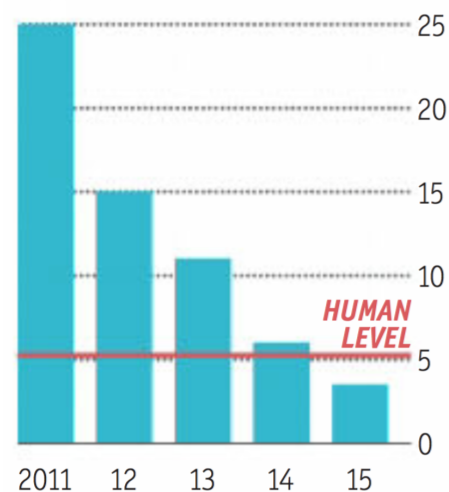- InstaDeep
- Deeplite
- nnaisense
- HACARUS

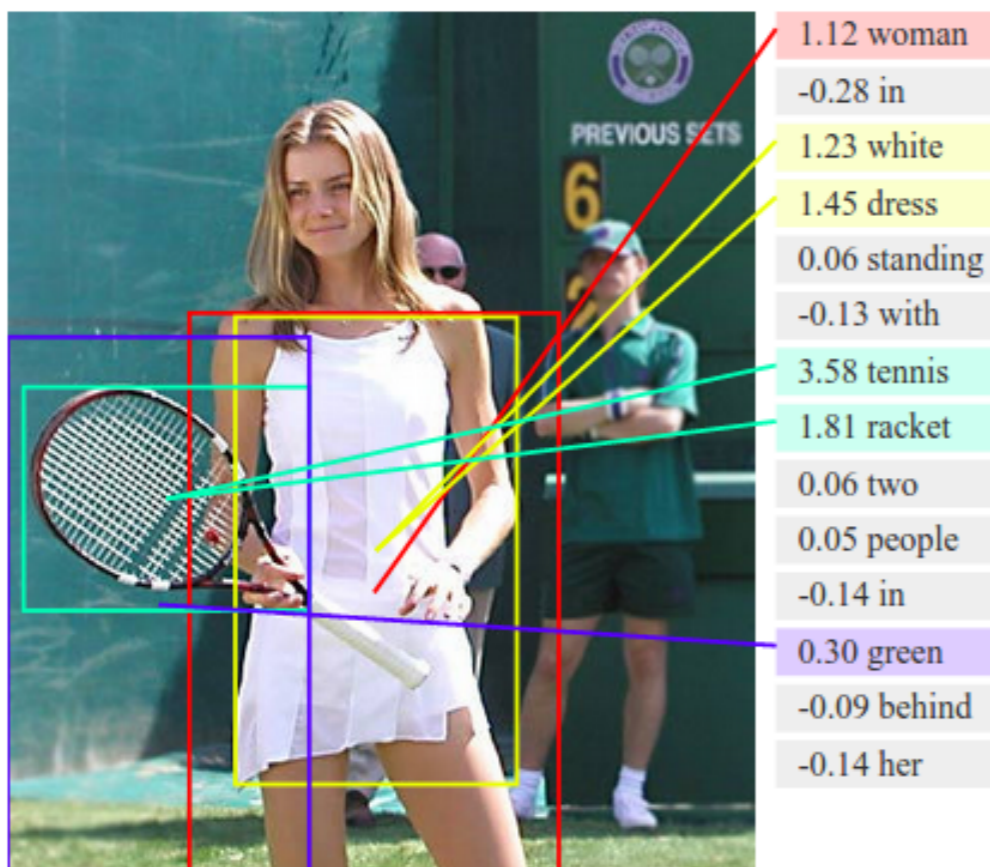Created by You. Powered by CB INSIGHTS

Source: CB Insights

What is Common Across AI Startups?
Deep Learning Revolution

Error rates on ImageNet Visual Recognition Challenge, %

Machines are now better at vision than humans (source: Stanford)


Example of the Stanford vision AI algorithm in action

- Deep Learning is a class of **Machine Learning** techniques that combine large neural networks (millions of free parameters), high performance computing (thousands of processors running in parallel), and Big Data (e.g. millions of color images or recorded chess games).

- Deep Learning is **revolutionizing perception** of the world by software agents (vision, voice, natural language, etc), and is now beating humans at many of these tasks.

- Deep Learning is also **supercharging capabilities** of industrial and consumer robots, as well as autonomous vehicles, since perception is crucial to embodied AI.

A Bit of History
Steam Engine Amplified Our Muscle
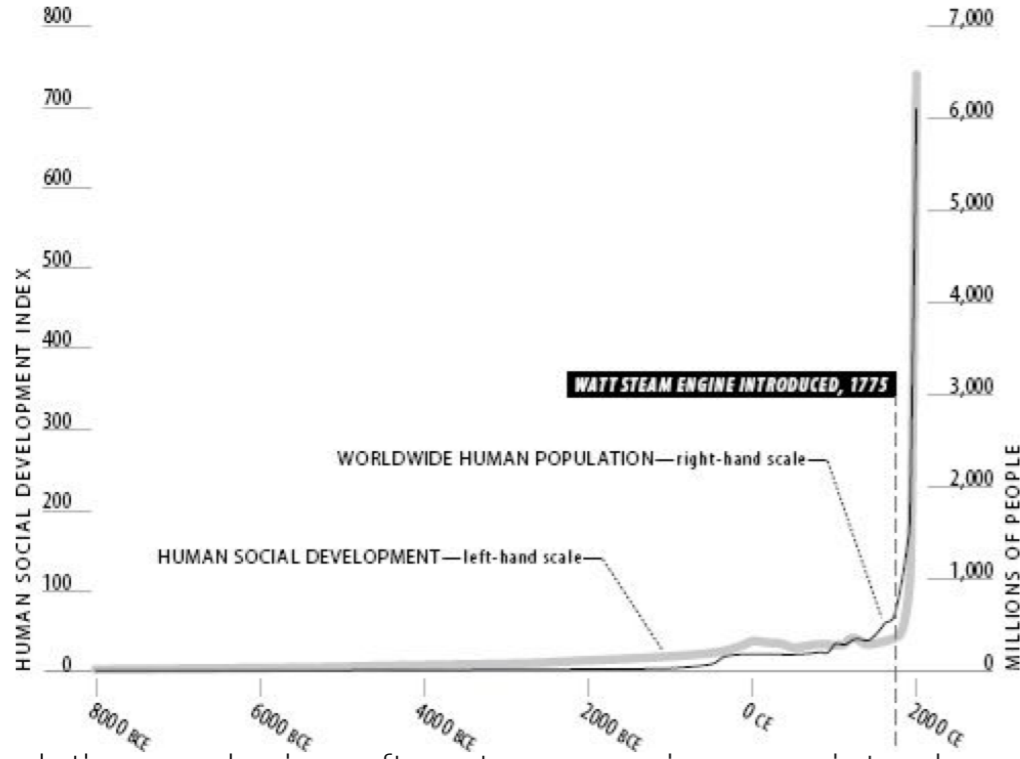
Population explosion after steam engine was introduced*

Industrial Revolution and GDP per capita

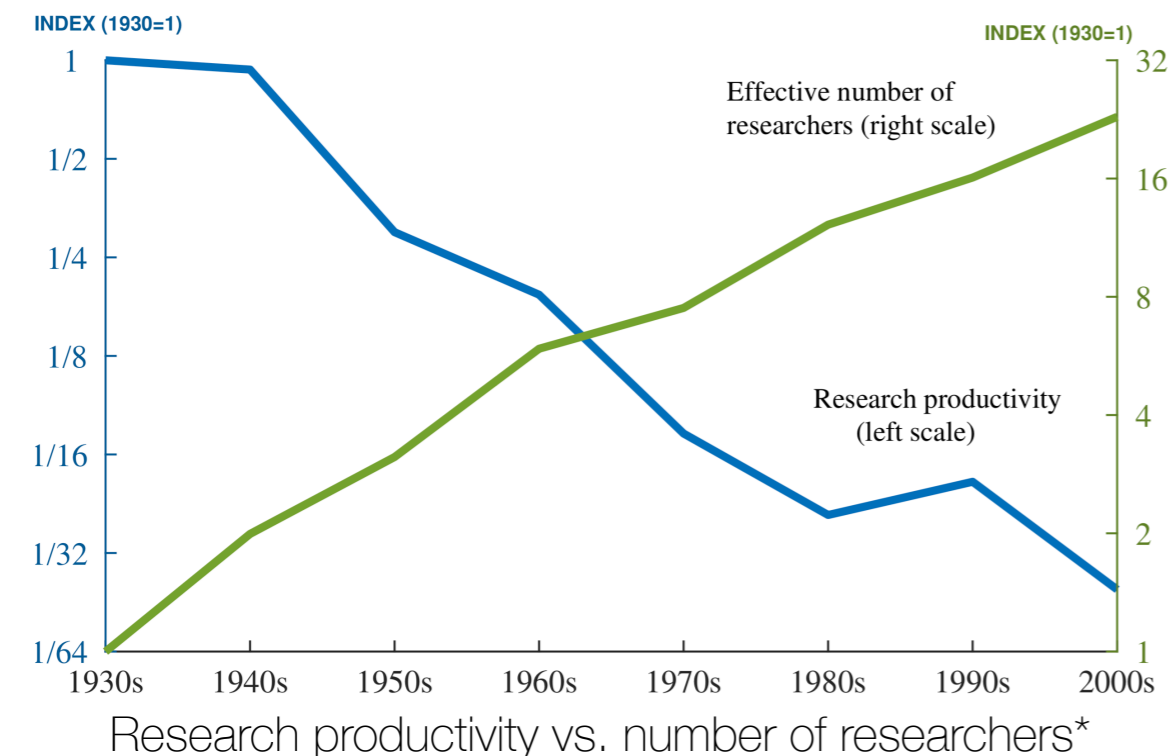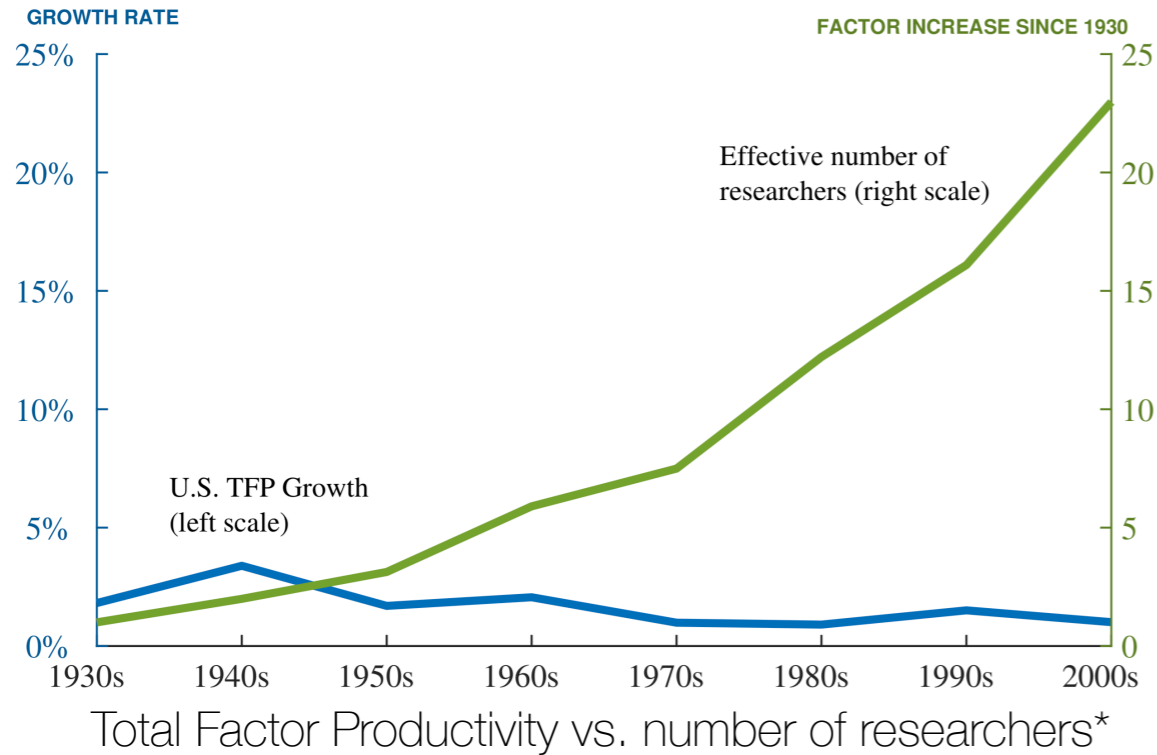* Source: Erik Brynjolfsson. Second Machine Age.
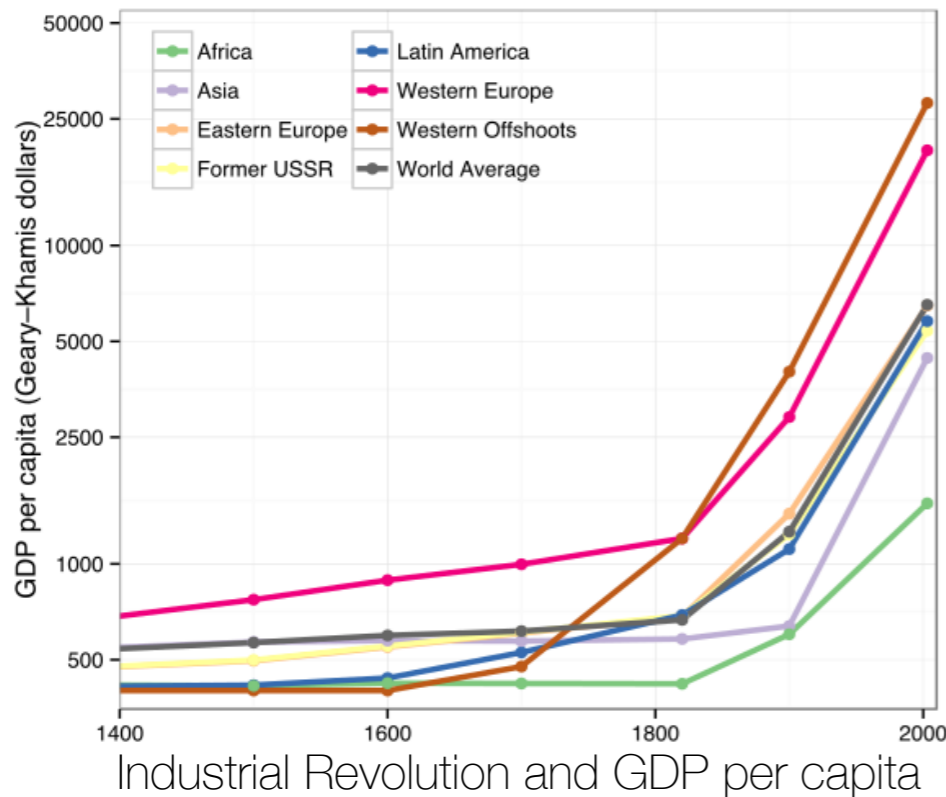
- James Watt's **steam engine** introduced in 1775 allowed humans to overcome the limitations of muscle power with mechanical power.

- This enabled **simultaneous rapid developments** in mechanical engineering, chemistry, metallurgy, electricity, etc.

- The result was an **explosion** in both human population and human social development.

- The Industrial Revolution ushered in humanity's **first machine age**: for the first time our progress was driven almost entirely by technology, rather than biology.

- That technology was easy to copy, which caused **rapid globalization** on top of rapid technological development.

A Bit of History
Now AI is Amplifying Our Intelligence

Total Factor Productivity vs. number of researchers*
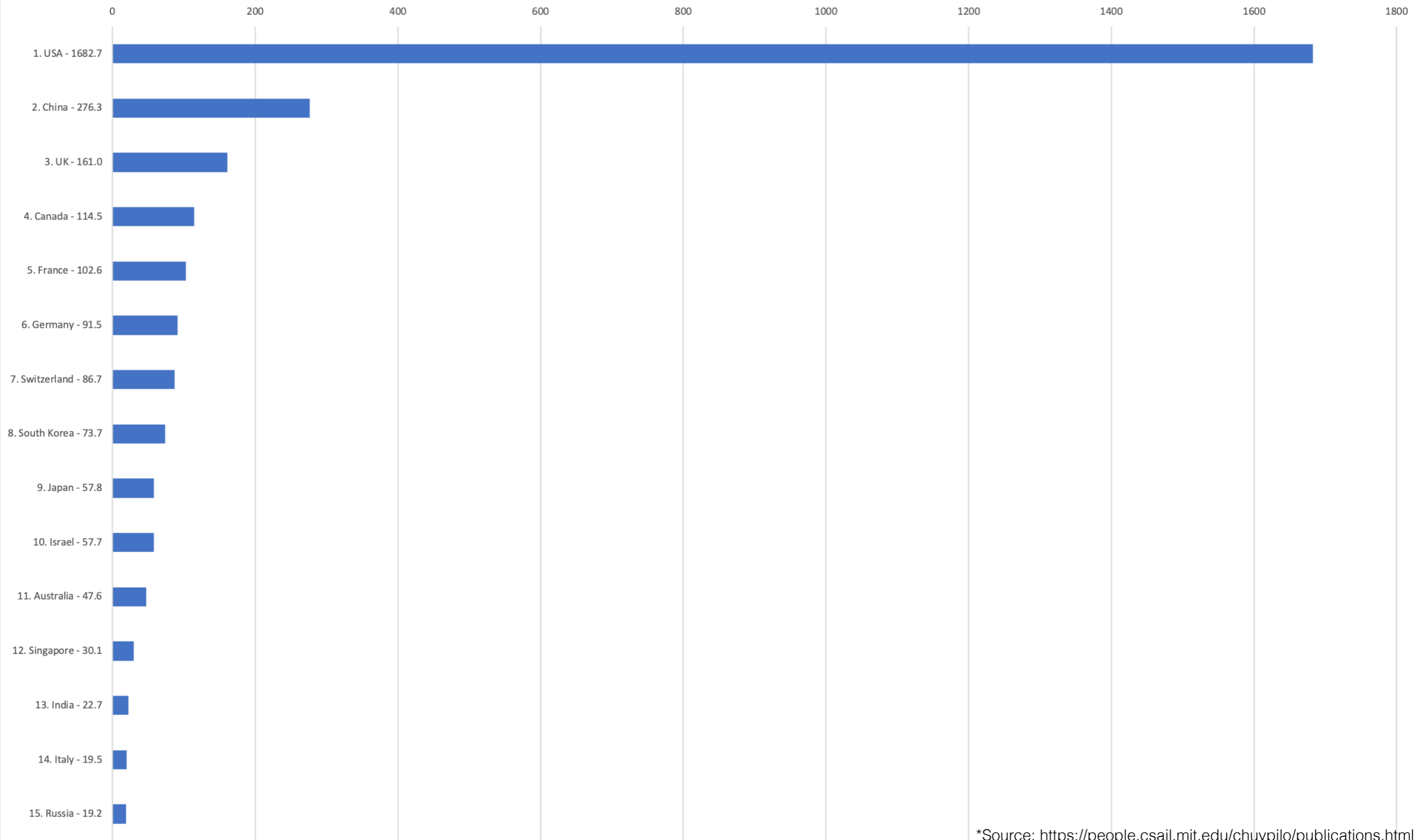
Research productivity vs. number of researchers*

- We live in an age of **paradox**. Systems using **AI** match or **surpass human-level performance** in more and more domains, yet measured **productivity growth** has **declined** by half over the past decade, and real income has stagnated since the late 1990s.

- Our solution to this productivity paradox is to leverage a **different flavor of AI called IA**, or **Intelligence Amplification**, invented along with the now-forgotten science of **Cybernetics** by Norbert Wiener and Ross Ashby in the 1940s.

- This investment thesis is effectively a **long exposure to productivity gains resulting from innovation in AI**.

Who's Leading this AI Revolution?
USA Has 6x Lead Over China

AI Publication Index 2020 (ICML 2020 + NeurIPS 2020)

Rank	Value
1. USA - 1682.7	1682.7
2. China - 276.3	276.3
3. UK - 161.0	161.0
4. Canada - 114.5	114.5
5. France - 102.6	102.6
6. Germany - 91.5	91.5
7. Switzerland - 86.7	86.7
8. South Korea - 73.7	73.7
9. Japan - 57.8	57.8
10. Israel - 57.7	57.7
11. Australia - 47.6	47.6
12. Singapore - 30.1	30.1
13. India - 22.7	22.7
14. Italy - 19.5	19.5
15. Russia - 19.2	19.2

Who's Leading this AI Revolution?
Top Innovators in AI

AI Publication Index 2020 (ICML 2020 + NeurIPS 2020)

Rank	Organization	Value
1.	Google (USA)	220.1
2.	Stanford University (USA)	106.1
3.	MIT (USA)	99.6
4.	UC Berkeley (USA)	86.7
5.	Carnegie Mellon University (USA)	71.3
6.	Microsoft (USA)	66.5
7.	University of Oxford (UK)	51.9
8.	Facebook (USA)	48.5
9.	Tsinghua University (China)	46.8
10.	Princeton University (USA)	45.0
11.	UT Austin (USA)	40.1
12.	ETH (Switzerland)	39.0
13.	EPFL (Switzerland)	36.5
14.	Harvard University (USA)	36.0
15.	Cornell University (USA)	35.6
16.	Columbia University (USA)	33.3
17.	New York University (USA)	33.2
18.	UCLA (USA)	33.0
19.	University of Illinois (USA)	32.8
20.	KAIST (South Korea)	31.8

*Source: https://people.csail.mit.edu/chuvpilo/publications.html
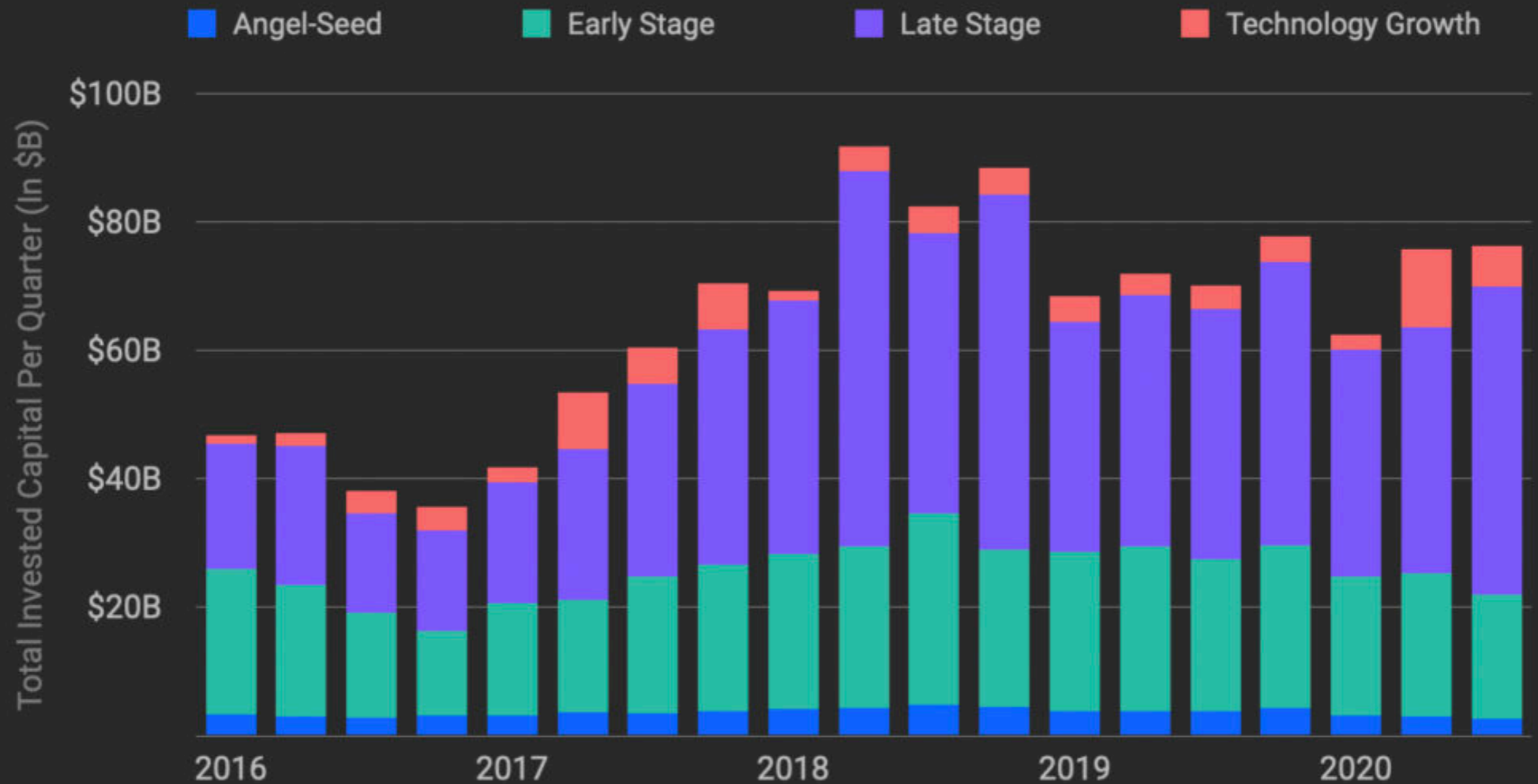
Did Covid Affect AI Startups?
Venture Funding is Strong in 2020

Global Venture Dollar Volume Through Q3 2020 By Stage

Source: Crunchbase

Did Covid Affect AI Startups?
Pace of AI Acquisitions is Increasing

THE PACE OF AI ACQUISITIONS HAS RAPIDLY INCREASED IN RECENT YEARS

Each line represents 1 AI acquisition

2010 2011 2012 2013 2014 2015 2016 2017 2018 2019

Thundermark Capital
We Focus on 3 AI-driven Verticals

Innovation in Intelligence Amplification	
• AI-Powered **Healthcare**	• Personalized Healthcare • Drug & Chemical Discovery • Medical Imaging/Diagnostics • Patient Analytics • Computational Biology
• AI-Powered **Fintech**	• Credit Scoring/Direct Lending • Quantitative & Asset Management • Insurance • Regulatory/Compliance • Fraud Detection
• AI-Powered **Enterprise**	• Robotic Process Automation • Retail/Warehouse • Intelligent Logistics/Supply Chain • Drones • Autonomous Vehicles/Delivery

Thank You and Please Stay in Touch!

gleb@thundermark.com