Opportunities & Challenges in Building AI Startups

簡立峰

Google

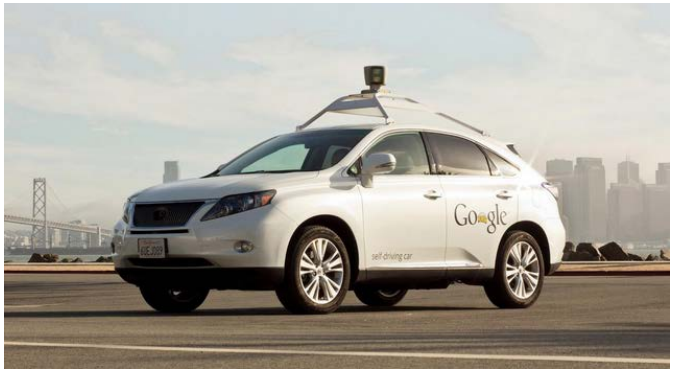
Google's Pichai Sees 'Move From Mobile-First To An AI-First World'

Source: http://www.investors.com/

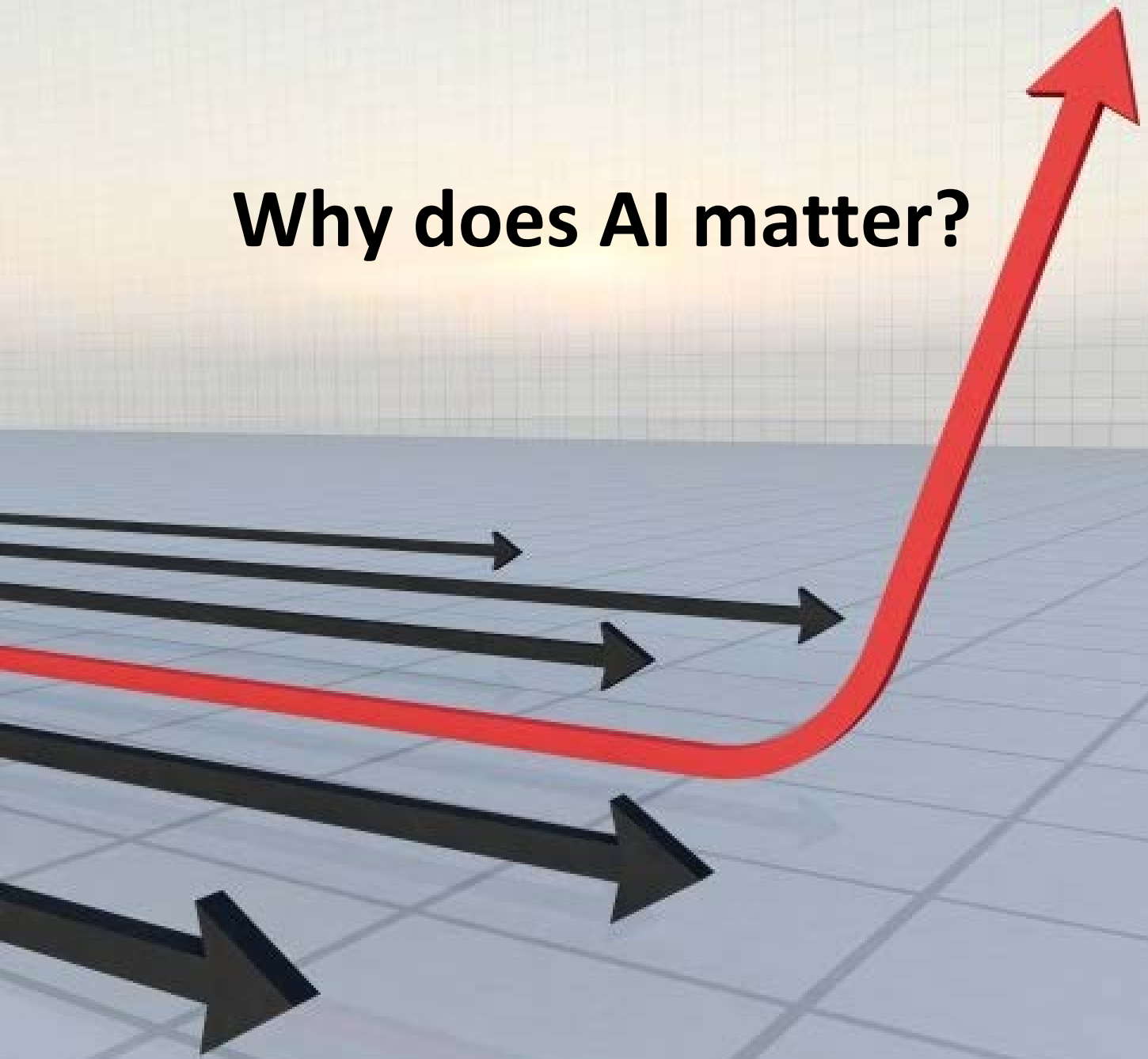
AlphaGo & Google DeepMind Enable New Wave of AI

AI is not New

- Spam mails catching (use ML to improve rules)
  - Spam rate is down to 0.1 %
  - False positive rate to 0.05 %
- Smart services using AI
  - Machine translation (Google translate launched in 2006)
  - Speech recognition
  - Image recognition
- Computer vision on self-driving car (2009)



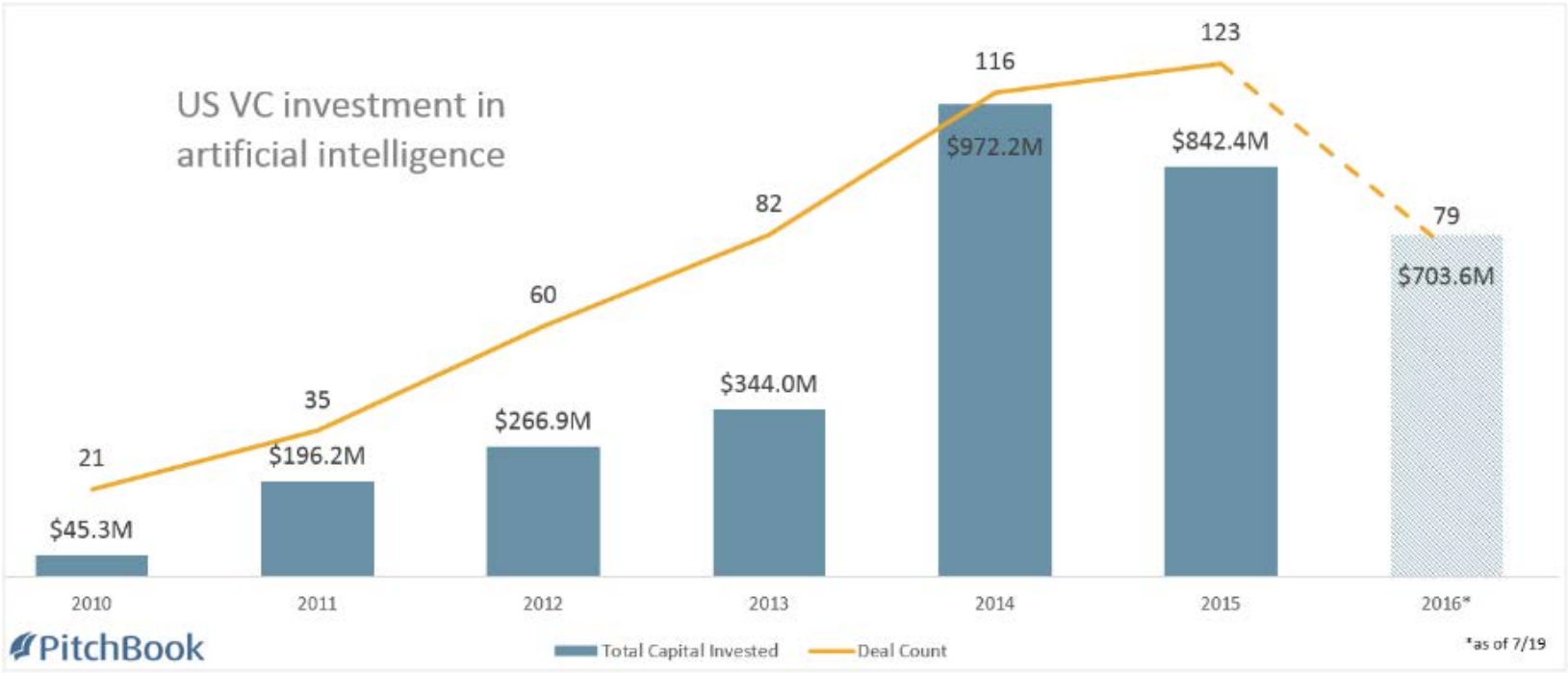
Why does AI matter?



Why does AI matter?

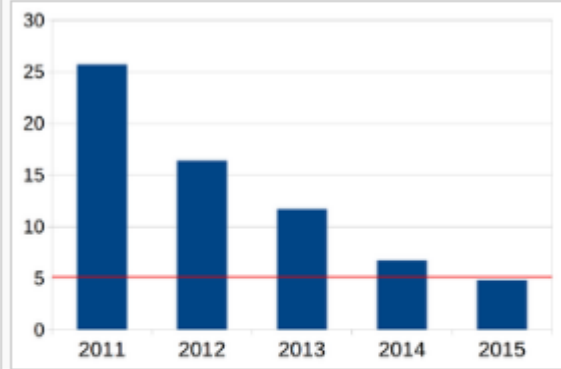
- Deep Learning algorithms show promising results
- Big Data is rapidly growing
- Scalable machine learning tools/platforms available
  - Tensorflow, open source software lib for ML

Huge Investment in AI Startups



Progress in AI (wiki)

- Super-Human
  - Chess, Go
  - Driving a car
- Par-Human
  - OCR, Classification of images
- Sub-Human
  - Handwriting recognition
  - Translation
  - Speech recognition
  - Natural Language Understanding
  - Many challenging problems for AI



Progress in machine classification of images

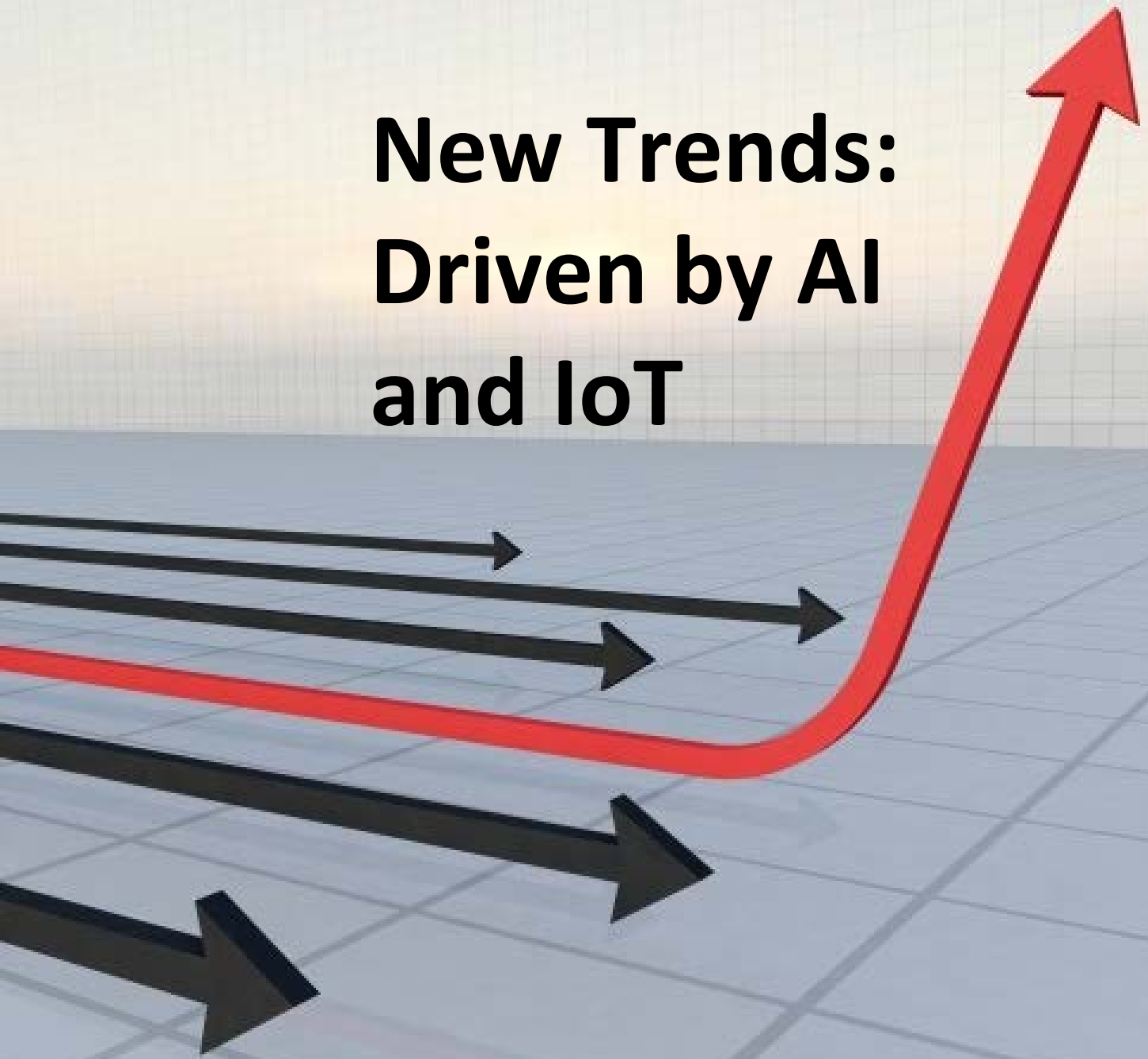
The error rate of AI by year. Red line - the error rate of a trained human

AlphaGo Zero
Starting from scratch

What AI is and isn't ?

- Domains that AI works well
  - Modern AI can match or exceed human in narrow domains
  - Knowledge that is trainable by data
  - Behavior that is predictable
- Domains that AI didnt' work well
  - AI still lacks the flexibility and generality of the human mind
  - Semantic-level understanding
  - …

New Trends: Driven by AI and IoT



The AI Wave:

Continuous Digital Transformation
after Cloud, Mobile, Big Data ...

2007

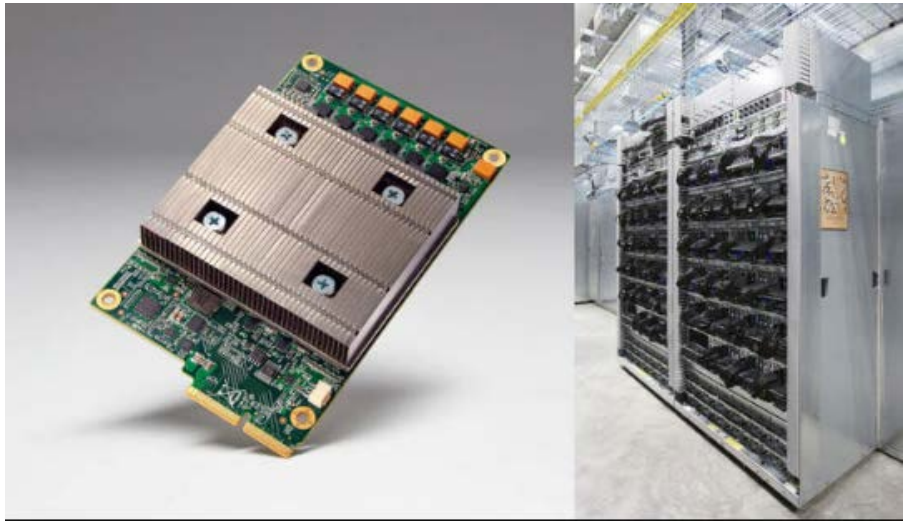
. iPhone
. Android
. Facebook
. Youtube
...

Trends:
Smartphone as AI Supercomputer
(Internet Giants as Hardware OEMs)

- Tim Cook: AI is the future of smartphone
- For privacy and latency reasons, some AI will run on a phone
- Instantaneous AI will take augmented reality far beyond *Pokémon Go*

Trends: Hardware Accelerates AI

- Google's Tensor Processing Unit (TPU) in the cloud
- NVIDIA's GPUs power deep learning neural networks
- Intel acquires AI company, Nervana and Movidius
- MIT: created chipset to perform AI tasks without being connected to the internet
- More efforts will move deep learning from cloud to phones, smart cars, robots, …

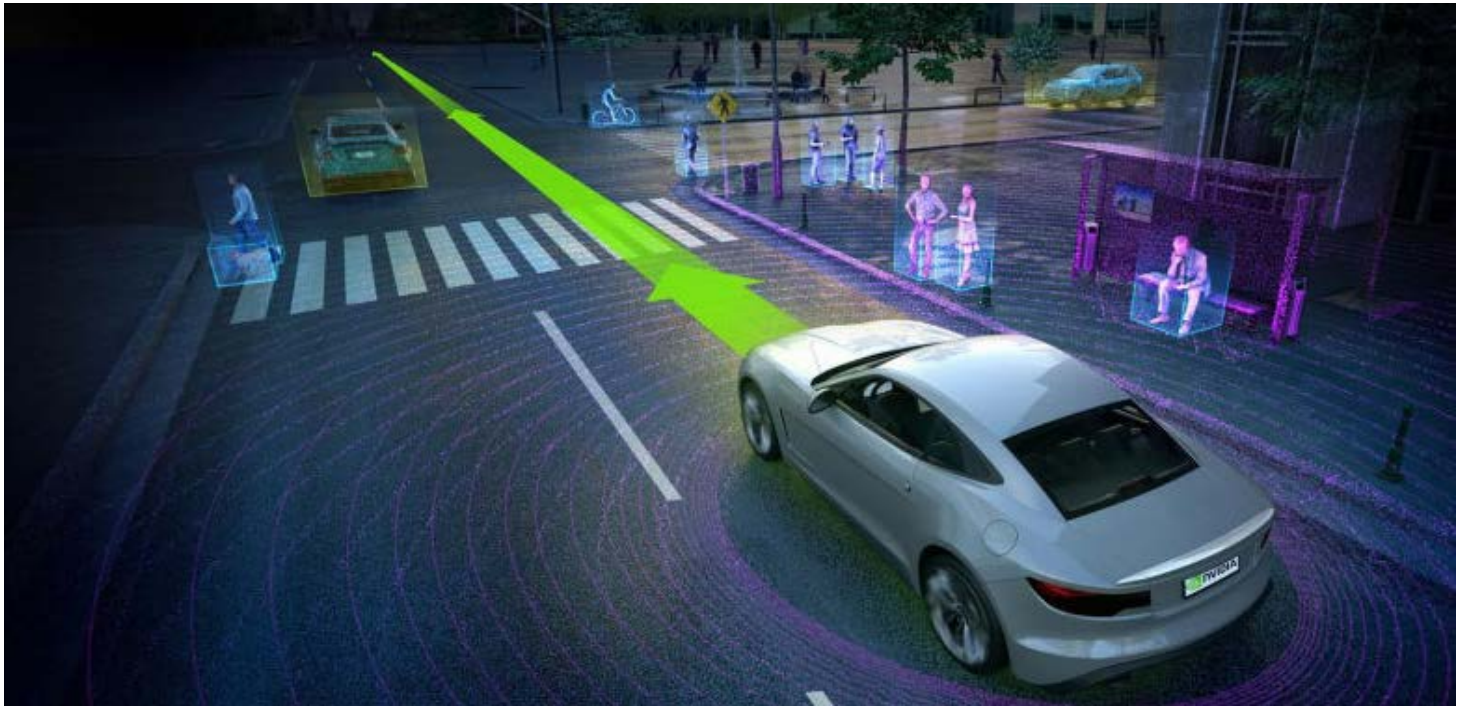


Trends: AI at Home

(24M Units: Smart Speakers Sales in 2017, estimated 100M Units & 13B USD in 2020)

The first smart services at home, natural dialog corpus collection,
Challenge for TW: language localization, smaller market adaptation

Trends: AI on Car



Huge opportunities for new services & huge impacts to various industries

Challenges for TW ICT manufactures: no strong automobile industry backup, diverse models & small amount, certification takes time

Trends:
Drone: Next Camera Follows You

amazon
PrimeAir

60.0
59.0
58.0
57.3 m
56.0
55.0
54.0
42 %
0.2 km/h

Trends: Robotics

BMWs' Car Factory

On Medical Service

Robot on patrol at Stanford Shopping Center

Building AI Startups?

- Recruit top talent
  - Value human capital as an asset
  - Top 10 Employee
- Leverage Taiwan's Strength
  - SW x HW
- Go global from Day One

Top Talent

APP Top Talent

Rank	Country	Developers	Rank	Country	Developers
1	United States	1,567	11	France	219
2	China	776	12	Israel	196
3	United Kingdom	456	13	Canada	191
4	South Korea	395	14	Turkey	183
5	Japan	351	15	Vietnam	173
6	Russia	321	16	Hong Kong	158
7	Germany	307	17	Australia	143
8	India	289	18	Brazil	138
9	Taiwan	256	19	Italy	137
10	Spain	239	20	Finland	116

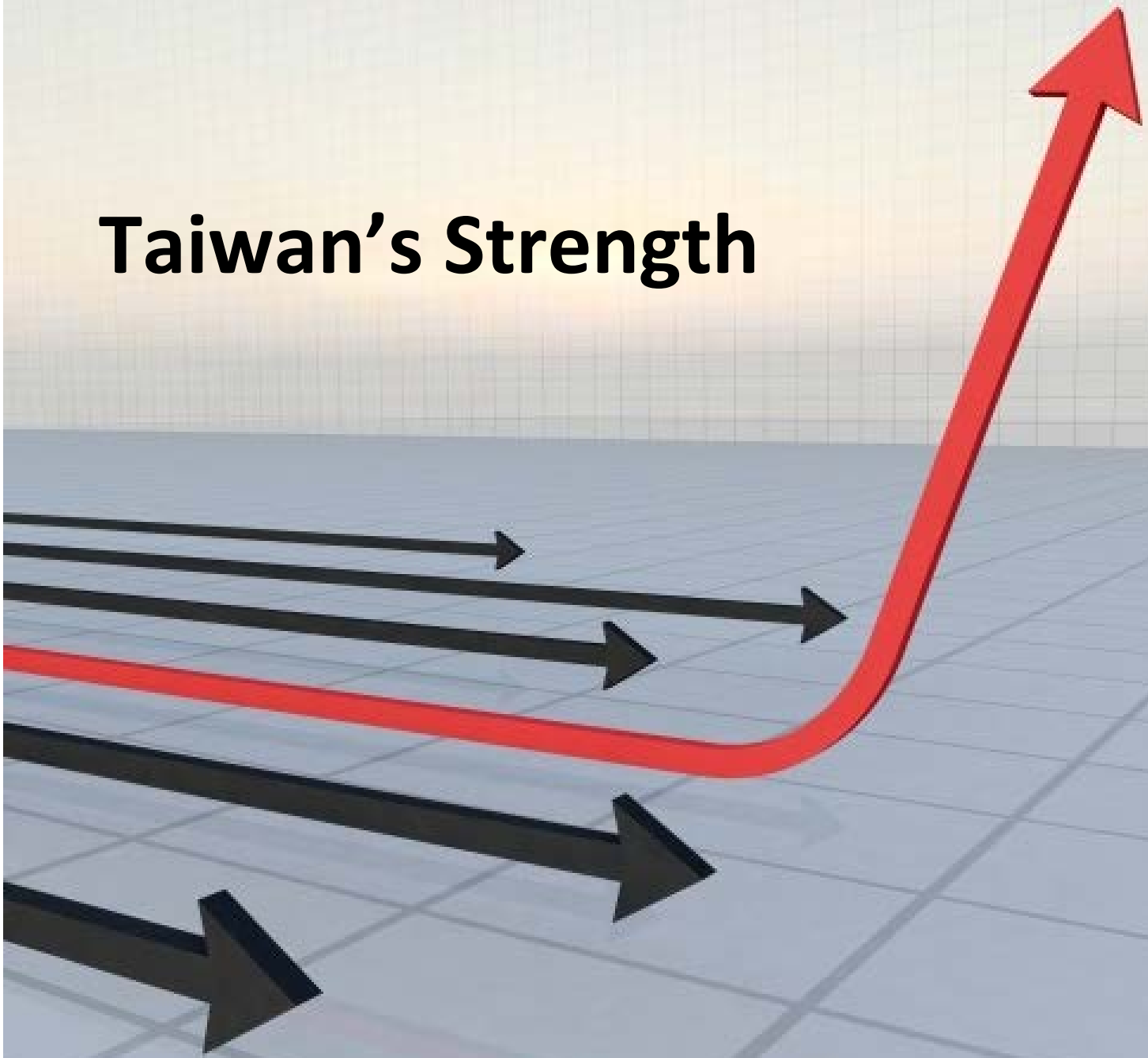
Source:Mozilla

Talent Strength

HackerRank站對全球開發者解題速度與精準度統計，台灣實力在全球排名第七，亞洲排第三，其中數據結構、資料庫、函數程式語言和演算法等，都排前五名；而美商謀智（Mozilla）與英國智庫Caribou Digital發表全球App經濟報告，台灣人才素質也名列前十。

App Annie統計，台灣行動應用程式於Google Play海外總下載量，從二○一二年的四千三百萬次，成長到一六年的四．六五億次，成長超過十倍。

Taiwan’s Strength



Taiwan: the World's Silicon Island Google

Hometown of

First Android phone,

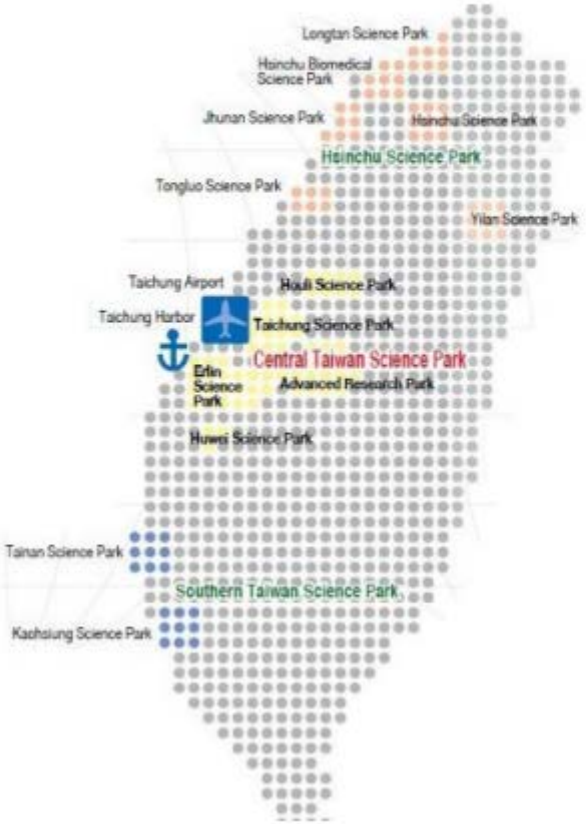
First Nexus tablet,

First Chromebook,

First Chromebook

With android apps

...



Google

1Q15 Top 20 Semiconductor Sales Leaders ($M, Including Foundries)

1Q15 Rank	2014 Rank	Company	Headquarters	2014 Tot Semi	1Q14 Tot Semi	1Q15 Tot Semi	1Q15/1Q14 % Change
1	1	Intel	U.S.	51,400	11,666	11,632	0%
2	2	Samsung	South Korea	37,810	8,797	9,336	6%
3	3	TSMC*	Taiwan	24,976	4,852	6,995	44%
4	4	Qualcomm**	U.S.	19,291	4,243	4,434	5%
5	6	SK Hynix	South Korea	16,286	3,507	4,380	25%
6	5	Micron	U.S.	16,720	4,017	4,070	1%
7	7	TI	U.S.	12,167	2,791	2,939	5%
8	8	Toshiba	Japan	11,040	2,793	2,750	-2%
9	9	Broadcom**	U.S.	8,428	1,984	2,058	4%
10	12	MediaTek**	Taiwan	7,032	1,608	1,799	12%

Top 100 R&D Investors

(Source: PwC)

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FOXCONN

HON HAI

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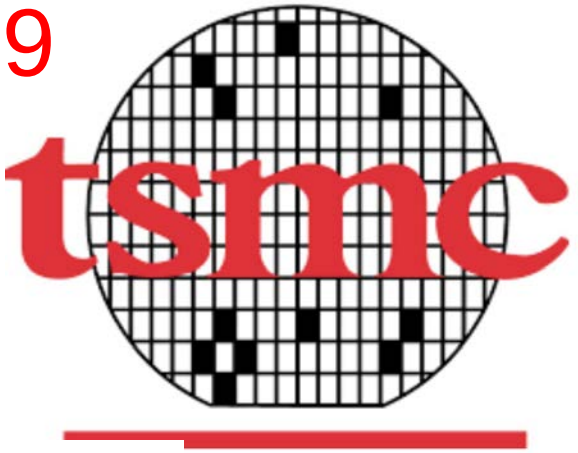

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MEDIATEK

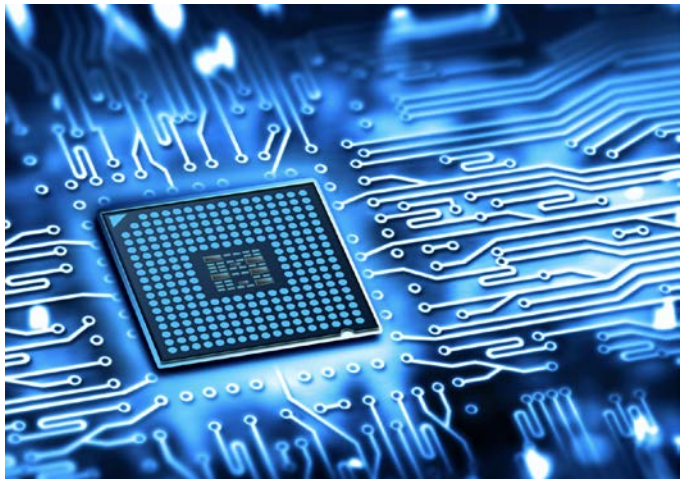
Software x Hardware (Integration)

Gogoro ranked 7th in top IoT startups

(Forbes)

AI技術IC化

- Computer vision+camera modules/tech+lens
- Niche services/applications such as in security, manufacture, healthcare, etc.



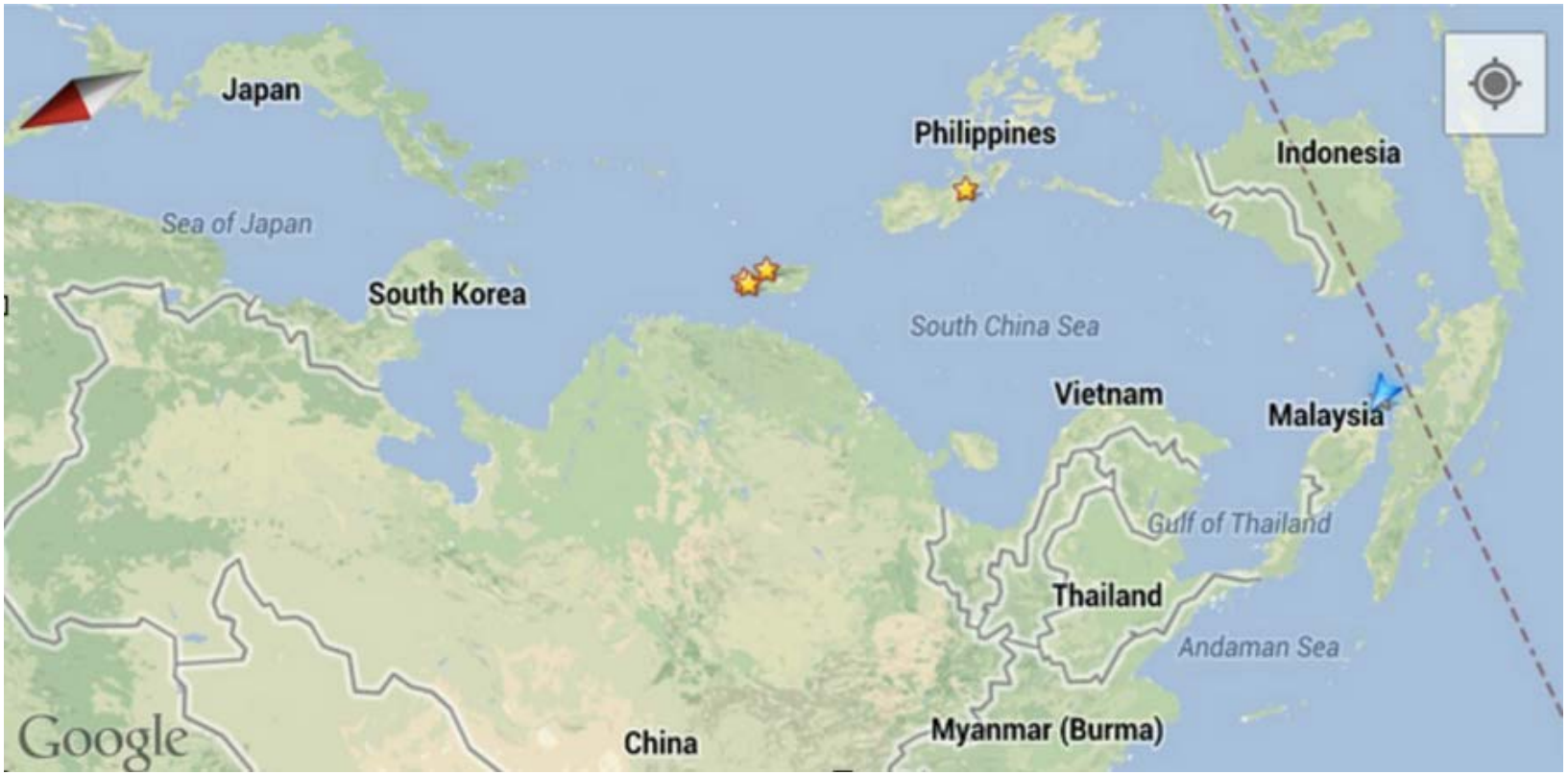
Cross Disciplines/Industries

- 異業整合
  - EE + CS + MD: 智慧醫療, 智慧照護
  - EE + CS + ME: 智慧製造, 智慧汽車
- 世代整合
  - 新舊產業, 實體與數位產業
  - 傳統產業網路化，數位化

Go Global

從海島到海洋

換個角度看台灣


Japan
Philippines
Indonesia
Sea of Japan
South Korea
South China Sea
Vietnam
Malaysia
Gulf of Thailand
Thailand
Andaman Sea
Google
China
Myanmar (Burma)

創新小國

Arctic Ocean
Kara Sea
Greenland Sea
Barents Sea
Russia
Denmark Strait
ARCTIC CIRCLE
66°30' N
Norwegian Sea
Finland
Atlantic Ocean
North Sea
Baltic
ASIA
EUROPEAN RUSSIA
English Channel
EUROPE
Kazakhstan
Bay of Biscay
Black Sea
Caspian Sea
Turkey
Strait of Gibraltor
Iran
Syria
Tunisia
Mediterranean Sea
Lebanon
Morocco
Israel
Iraq
Jordan
ASIA
MIDDLE EAST
Algeria
Libya
800 mi
800 km
Egypt
23°5' N
TROPIC OF CANCER
Saudi Arabia
PRIME MERIDIAN
AFRICA
Red Sea
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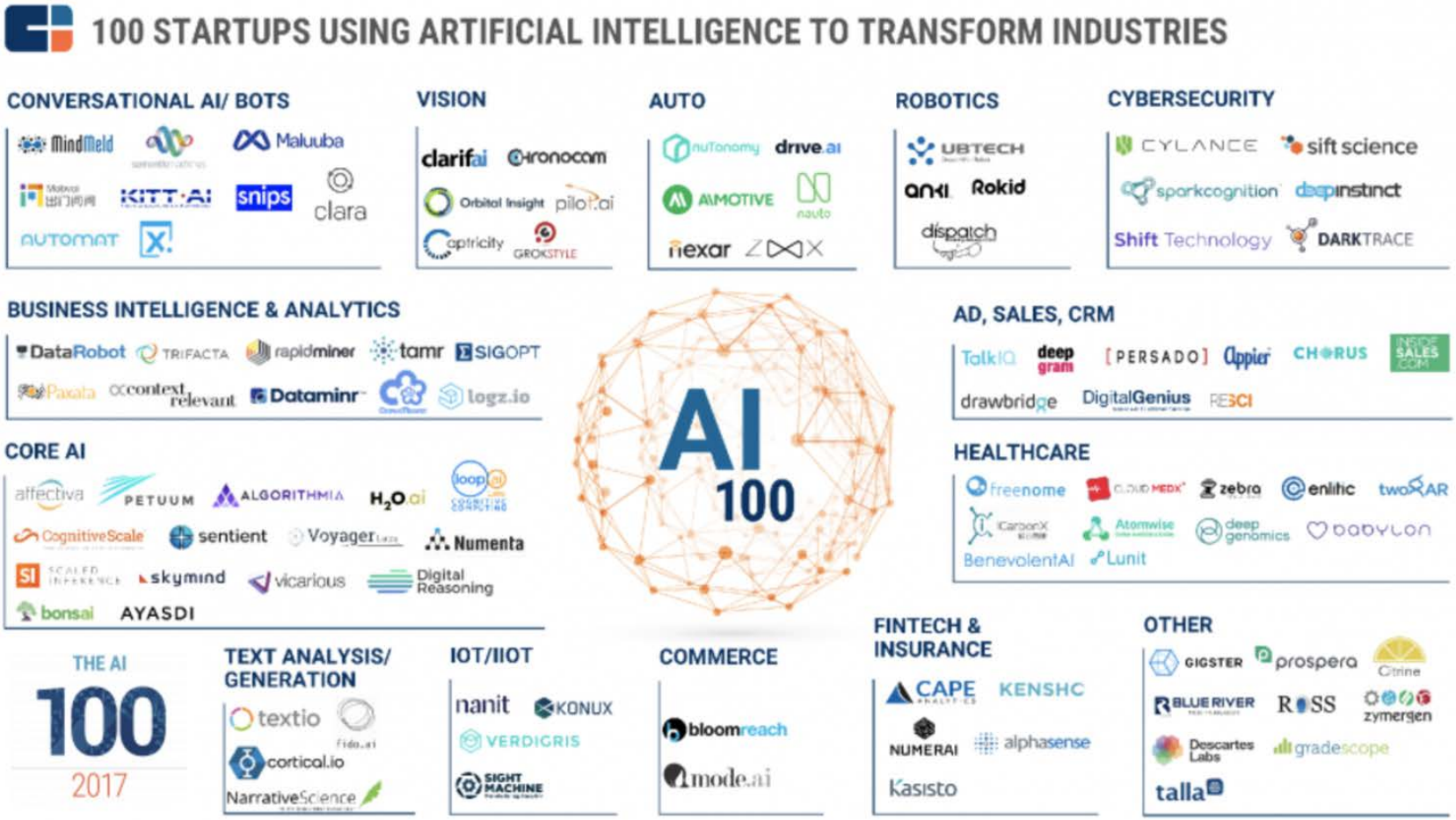
ISRAEL and...

The United States

技術輸出? 代工生產?

MOST INNOVATIVE CITY
#2 TEL AVIV
#1 SILICON VALLEY
HIGHEST NUMBER
NASDAQ
AFTER THE US AND CHINA
THE MOST
SCIENTISTS &
ENGINEERS
IN THE WORKFORCE
IN THE WORLD
LARGEST
NUMBER
OF STARTUP COMPANIES
IN THE WORLD

Appier: a Top 100 AI Startup



Source: CBINSIGHTS

Thanks !