



Institute of
Economics



EMERTECH 2019

An Alternative Ecosystem for AI Development:

Openness, Trust and Complementarity

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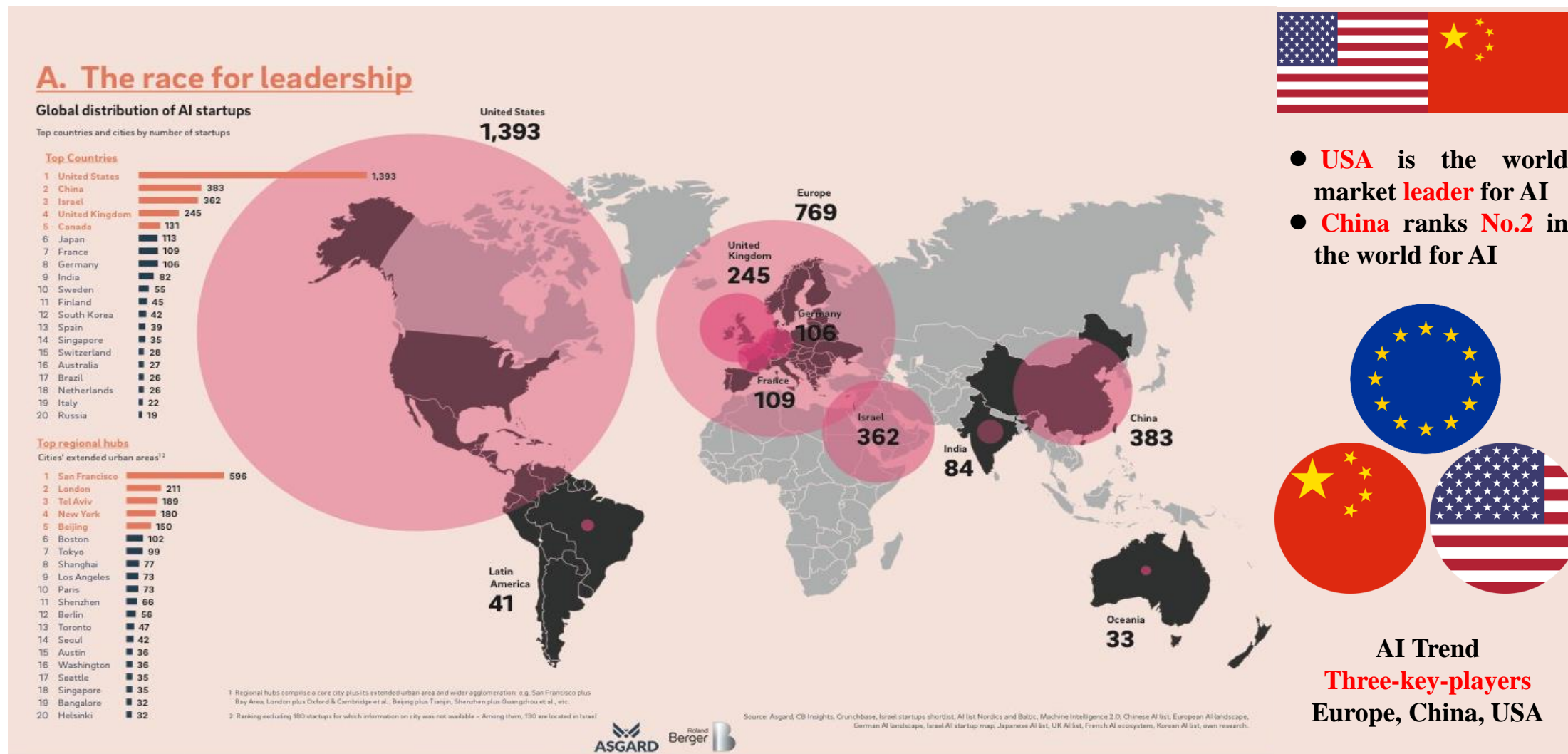


- AI Global Landscape
- AI Competition: One world, Two Systems?
- An Alternative Ecosystem for AI
- The Future Scenario for AI



GLOBAL AI INDUSTRY LANDSCAPE

● Global AI Landscape (Startup Companies, 2017)



- **USA** is the world market leader for AI
- **China** ranks No.2 in the world for AI



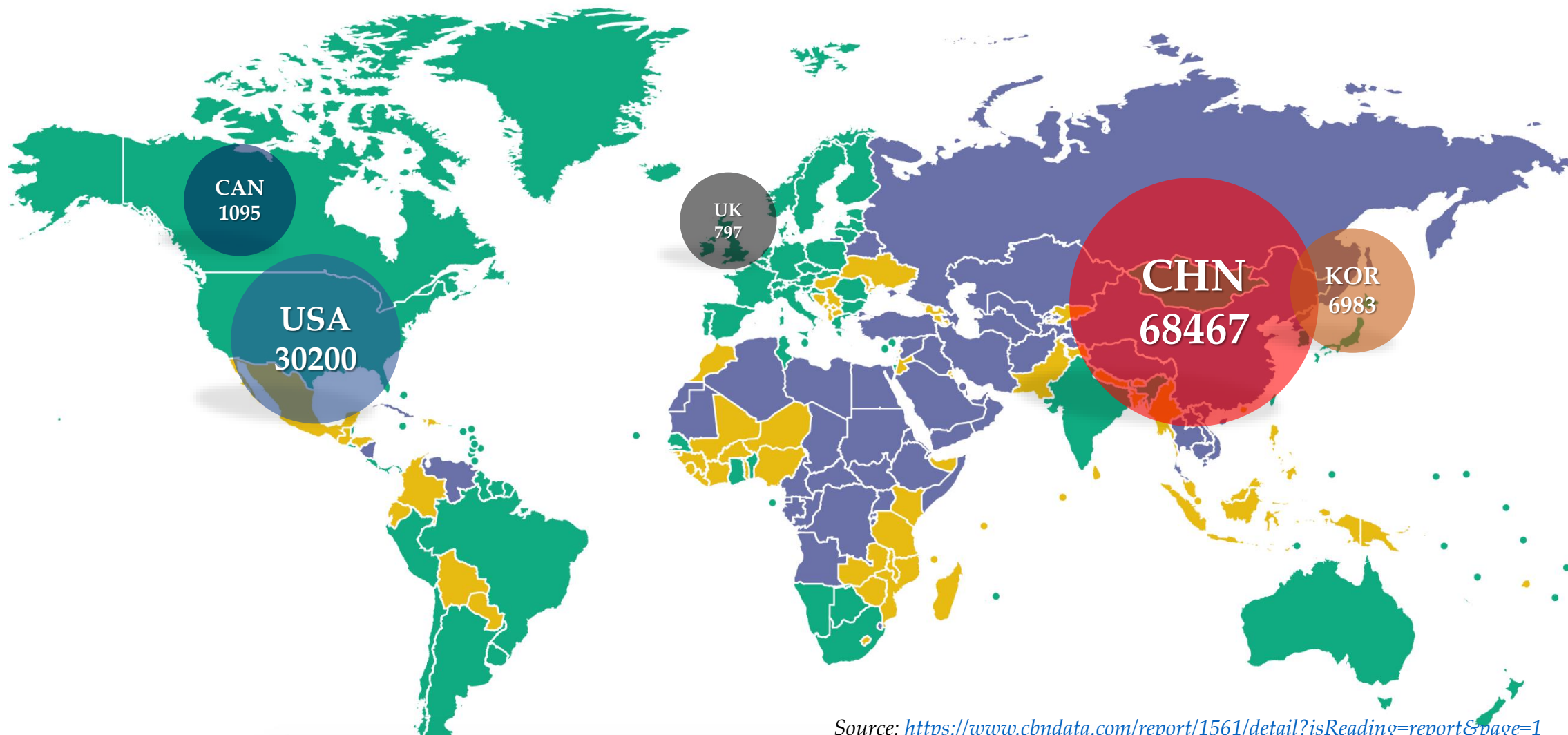
AI Trend
Three-key-players
Europe, China, USA

Source: <https://medium.com/@bootstrappingme/global-artificial-intelligence-landscape-including-database-with-3-465-ai-companies-3bf01a175c5d>
Download the database of 3,465 AI companies for free: <https://asgard.us12.list-manage.com/subscribe?u=e29acdd806ceff9d98646e294&id=d1ebcadf46>



GLOBAL AI INDUSTRY LANDSCAPE

- Global AI Landscape (AI IPs, 2018)

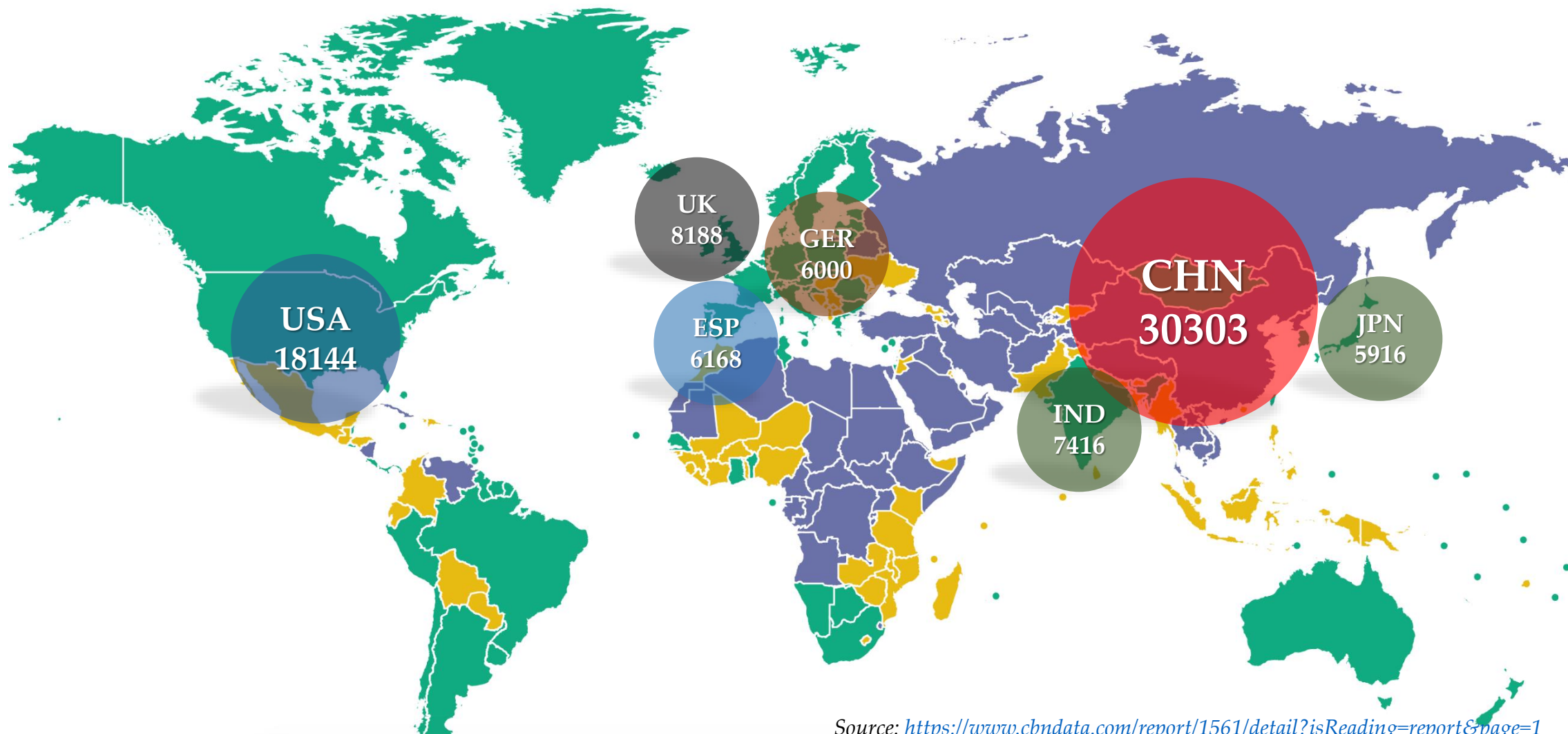


Source: <https://www.cbndata.com/report/1561/detail?isReading=report&page=1>



GLOBAL AI INDUSTRY LANDSCAPE

- Global AI Landscape (AI Papers published for some countries, 2018)



Source: <https://www.cbndata.com/report/1561/detail?isReading=report&page=1>



AI TECHNOLOGY STAGES

- Three stages of AI Technology

The Growing Technology Maturity:
Big Data+ Computing capability + Better Algorithms

First Stage of AI: 1956 - 1974



The Dartmouth Summer Research Project on Artificial Intelligence in 1956

Bellman Equation: the rudiments of the AlphaGo algorithm

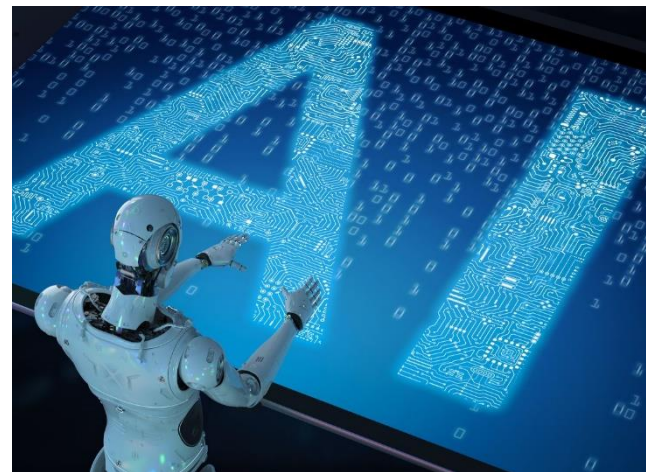
Second Stage of AI: 1975 - 2010



The 5th generation computer developed by the U.S., also called as the artificial intelligence computer at that time

AI algorithm: Multi-layered Neural Networks Algorithm, BP reverse propagated error algorithm

Third Stage of AI: 2011 - Now



New tools, new ideas and new algorithms emerge since 2011

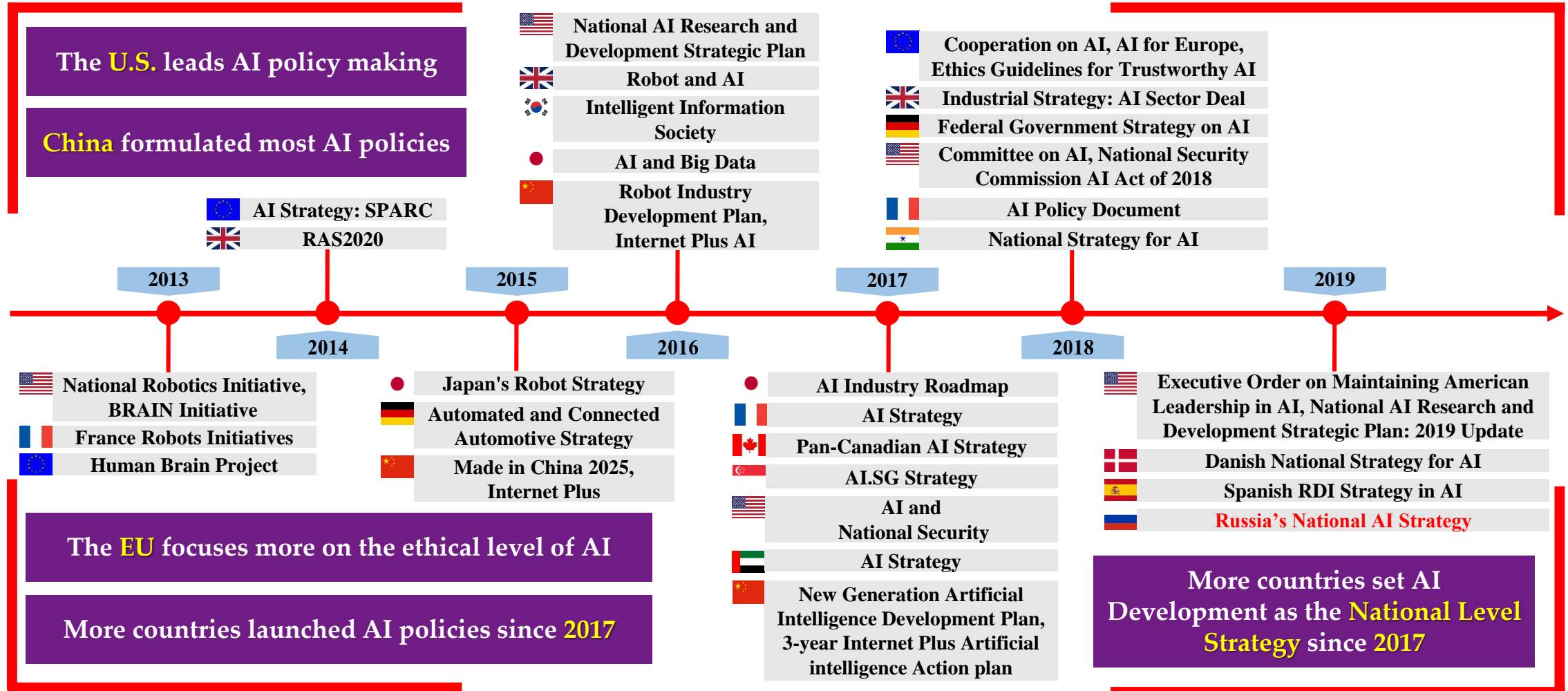
Hadoop Mechanism, IBM Watson
Popularization of big data, optimization of algorithm, and improvement of computing

Source: <https://cloud.tencent.com/developer/article/1184857>



GLOBAL AI POLICY

- AI Policy launched by different countries in the past few years



Source: Collected from the Internet



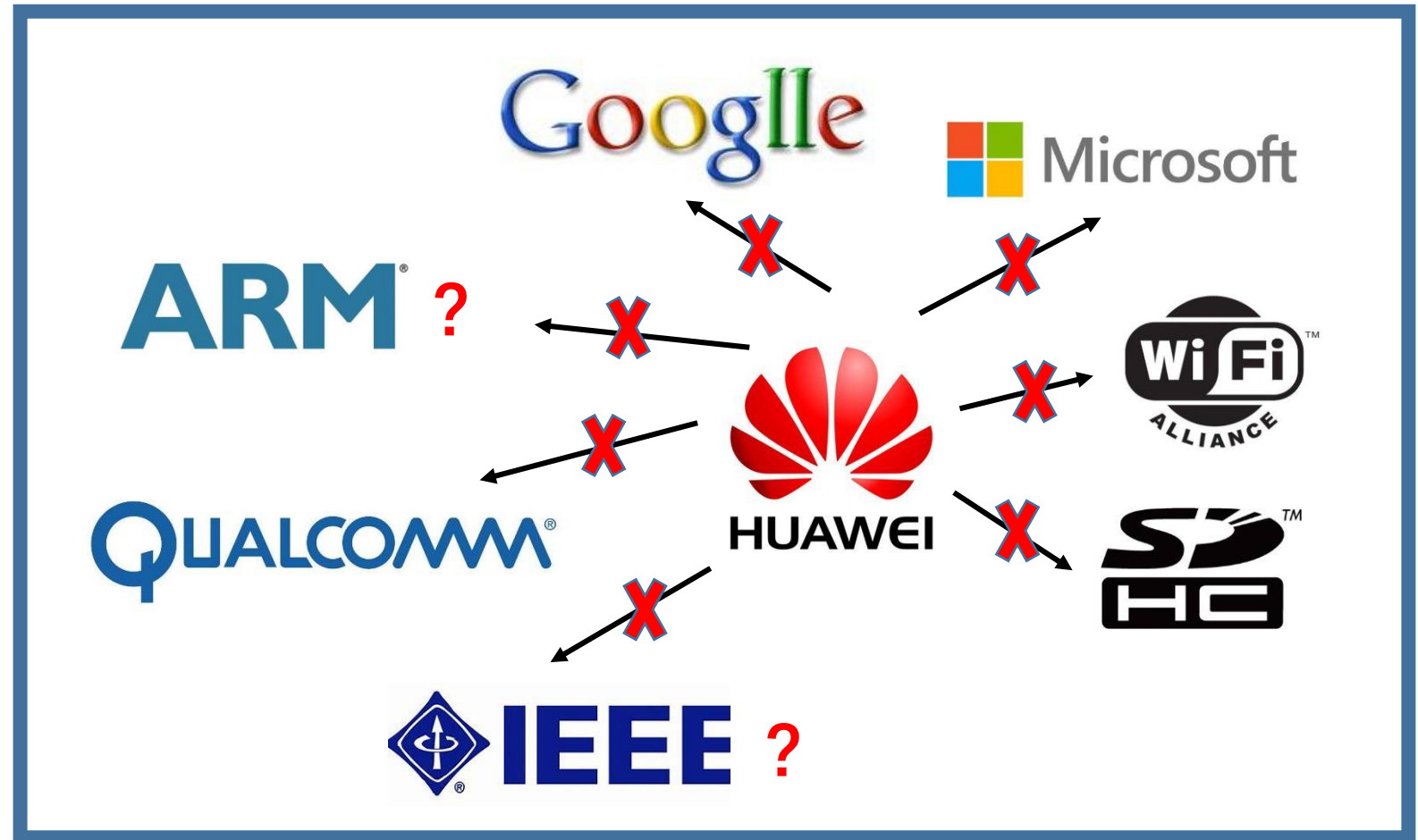
AI Competition: One World, Two Systems?



USA BLOCKS HUAWEI

- The following organizations stopped the cooperation with Huawei

- Google
- Microsoft
- **ARM?**
- Qualcomm
- **IEEE?**
- WiFi
- SD
- JEDEC
-



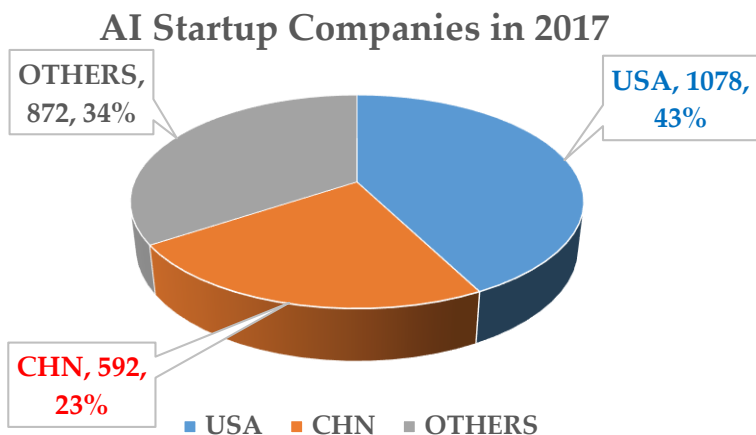
AI COMPETITION: ONE WORLD TWO SYSTEMS

Source: https://www.tisi.org/Public/Uploads/file/20170802/20170802172414_51007.pdf

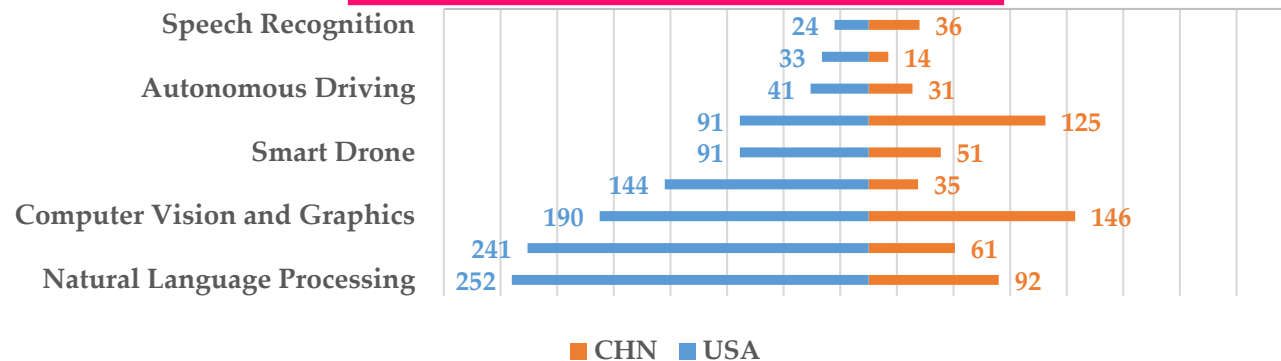
- Turing Point of global AI development: the US-China trade war



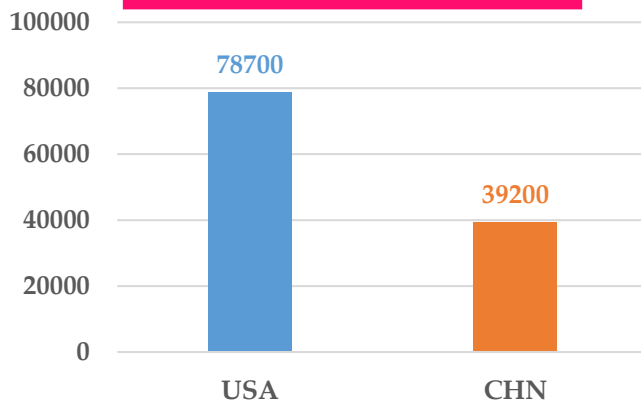
- the **U.S.** now maintains the leadership against **China** in AI field



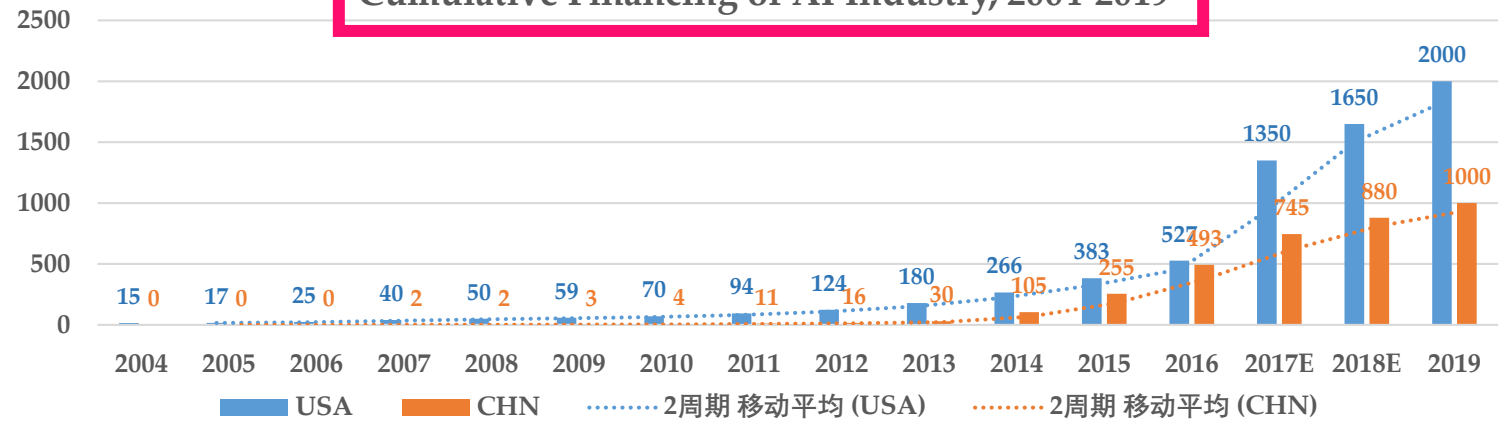
AI Companies in Different Areas



Number of AI Talents



Cumulative Financing of AI Industry, 2004-2019



AI COMPETITION: ONE WORLD TWO SYSTEMS

- The All-around Development of U.S. AI Industry: **Basic, Technology, Application level**

- China's** AI Industry: strong competitiveness in **application level**



		USA							CHN			
		Google	Amazon	Facebook	Microsoft	Apple	Intel	IBM	Huawei	Tencent	Baidu	Alibaba
Application Level	Consumer Products	Google Home, Google Automated Vehicle	Echo, Alexa, Amazon Go, PrimeAir Drone	Chatting Bot, Jarvis, Moments	Skype, Cortana, Tay, A-eye	Siri	/		HiAssistant, IoT	WechatAI, Dreamwriter	Baidu Automated Vehicle	Tmall Elf
	Industry Solutions	Voice Intelligence API, Google Cloud	Amazon Lex, Amazon Polly, Amazon Rekognition	Face Recognition Technology, DeepFace, DeepMask, SharpMask, MultiPathNet	/	/	/	Watson, Bluemix, ROSS	ModelArts	Cloud Search	Apollo, DuerOS	/
Technology Level	Tech-Platform/Framework	TensorFlow, Cloud Machine Learning Engine	AWS	Pytorch, Torchnet, FBLeaer Flow	DMTK, Bot Framework, Github	/	/	System ML	MindSpore, Gauss, Euler, Harmony OS	Tencent Cloud, Angel, NCNN	Paddle-Paddle	PAI 2.0
Basic Level	Chips	TPU, Cloud TPU, Quantum Computer	Annapurna ASIC	Big Sur	FPGA Chip	Apple Neural Engine	X86 chips	Brain-Like Chips	Ascend, HiSilicon	/	DuerOS	Ali-NPU

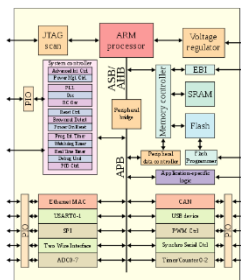
- In the trade war, the U.S. is seeking technology leadership in many ways
 - Exp.: the Trump administration's ban on selling to the Chinese tech giant Huawei
- A new AI ecosystem work together by other countries is highly needed !**

Source: collected form the internet

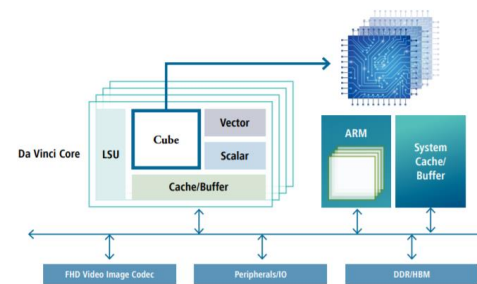


AI COMPETITION: ONE WORLD TWO SYSTEMS

- AI competition in the basic level: AI chip architecture



V.S.



ARM Architecture

ARM + Da Vinci Architecture

- AI competition in the technology level: AI framework

- A three key players of AI framework (Google, Facebook, Huawei)



Google TensorFlow



Facebook Pytorch



V.S.



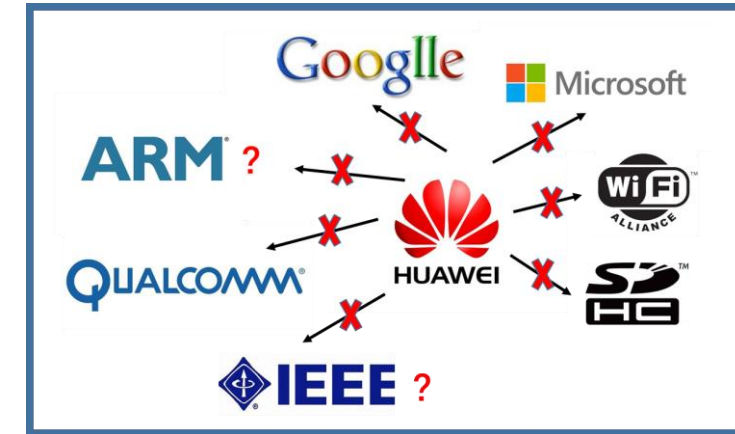
Huawei Mindspore

- Based on the AI chip architecture and AI framework, **the world is generating two AI ecosystems.**

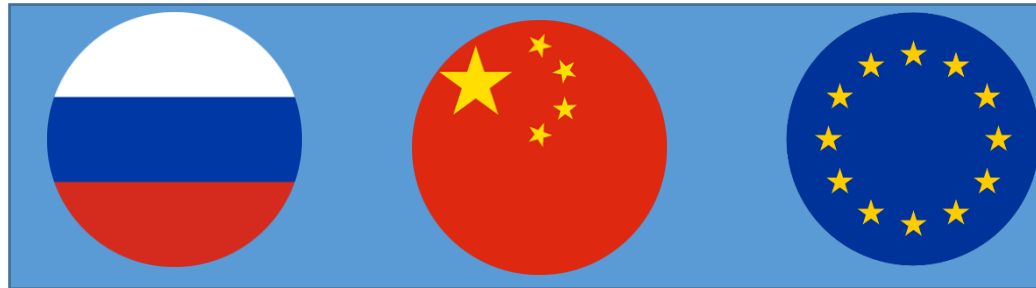
- A Second AI ecosystem with more Openness and Neutrality is** different from the U.S. AI ecosystem

Source: collected form the internet





An Alternative Ecosystem for AI



COOPERATE TO NURTURE A SECOND AI ECOSYSTEM

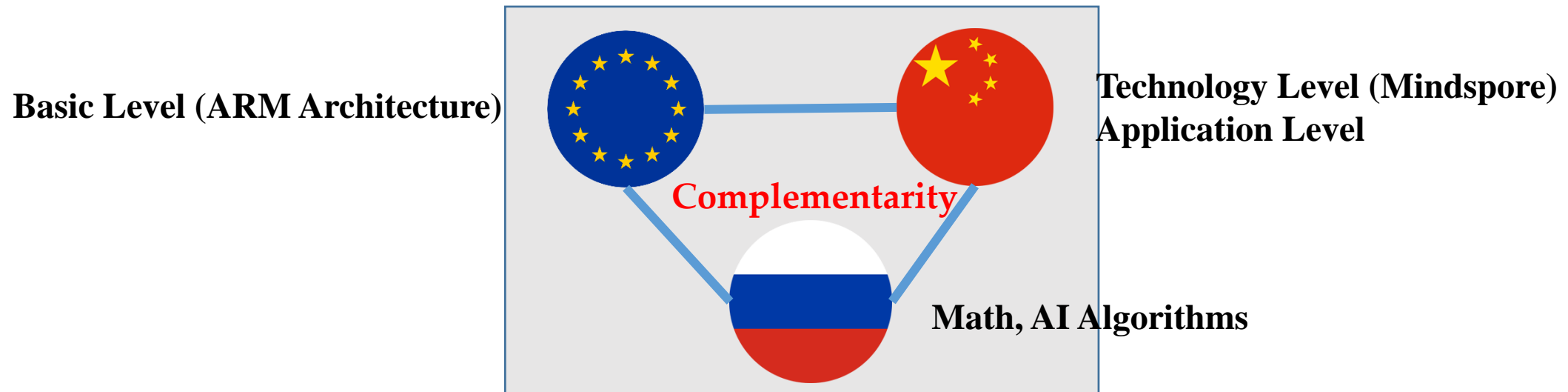
1. Vision: Cope with Grand Challenge and Conduct Existential Innovation

- The rest countries should together nurture a second AI ecosystem with **Openness**.

2. The Importance of Ecosystem Trust

- The lack of ecosystem **Trust** is the one of the key reasons for the trade war
- Build the ecosystem trust and together nurture an AI ecosystem

3. Complementarity to each other



The Future Scenario of AI Ecosystems:



The Necessity to Nurture a Second Ecosystem for AI
Or
The Alternative is

One world

One ecosystem

but, with Diversified solution

Openness

Trust

Complementarity





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Thank You!

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