

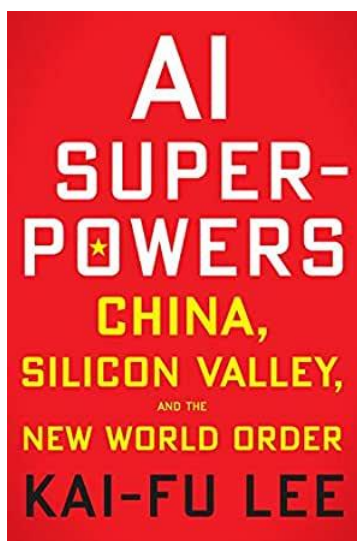
Book review | AI superpowers – China, Silicon Valley, and the new world order

Author | Kai-Fu Lee

Published | 2018

Reviewer | Liang Yin

Date of review | July 2020



Very quickly, tell me what this book is about

Underpinned by the author's deep technological know-how and diverse professional experience spanning both sides of the pacific, this book gives a unique perspective on the interplay between the US and China in the age of Artificial Intelligence (AI) and how the new world order will be shaped by it.

Lee has a rosy assessment of China's prospects in the AI race and expects the balance of AI capabilities between the US and China to shift in China's favour, despite the US enjoying a first-mover advantage for now. Chinese AI entrepreneurs sit atop the world's largest, by far, data supply ("the Saudi Arabia of data") and are supported by broad-based policy tailwinds carefully and boldly crafted by a central government determined for China to become an AI superpower. The US's lead in elite AI expertise carries less importance than many would expect because the age of AI has morphed into implementation from invention. In the age of implementation, quantity matters more than quality. Lee also provides a powerful rebuttal to a widely-held view that simply writes off Chinese entrepreneurs as copycats lacking in innovation power.

However, the book isn't just about the US vs China. There is an even bigger story here: humans vs AI. The US and China, in Lee's view, are leaping to massive lead over the rest of the world, which will exacerbate global inequality by putting disproportionate power in the hands of these two nations. Nonetheless, a more upsetting divide is likely to emerge within our societies. Massive job losses are a real possibility as the pace and magnitude of disruptions are likely to overwhelm labour markets' ability to cope and adapt. When people lose their jobs, not only is their means of survival taken away, they also lose a source of personal identity and meaning. This is not an issue that can be addressed by universal basic income.

Despite these warnings, the book is ultimately optimistic that the complementarity between humans and AI can lead to a productive human-AI coexistence. Offering a dose of optimism to counter the doomsday singularity prediction, Lee reminds us that when it comes to shaping the story of AI, we humans are not just passive spectators, we are the authors of it.

Who is Kai-Fu Lee? What credentials and potential biases does he bring to this book?

Kai-Fu Lee is a renowned AI expert. He developed the world's first continuous speech recognition system in his PhD thesis at Carnegie Mellon, which helped him land an executive role at Apple to lead its speech-recognition effort. This was two decades before Apple's Siri system was launched to the market. After Apple, Lee has worked in various executive roles in the US tech industry: Silicon Graphics, Microsoft and later Google, where he helped establish the Silicon Valley firm's presence in mainland China. In the last decade, Lee has focused on leading Sinovation Ventures, a Chinese technology venture capital firm that has invested in over 350 companies across the technology spectrum in China.

This diverse experience uniquely positions Lee to compare the US and China in the race for AI dominance. And his understanding of the two nations goes beyond just technology. As a Chinese person, his narratives about Chinese values, culture, educational system, societal normal and even parenting styles all strongly resonate with me. This is someone who knows deeply about China – the way Chinese people do things and what motivates and inspires them – and he gives an accurate and telling narrative in this book. I cannot validate his knowledge about the US but his educational and professional experience suggests a deep root in that country too.

Is Lee biased in any way (acknowledging that no one is bias free)? As a Taiwanese-born American, Lee is unlikely to have any preferential attachment to China's mainstream ideology. However, his current main market is China and he is investing in Chinese star-ups. He enjoys celebrity-level influence over millions of Chinese students who view him as a mentor and an inspiration. I am by no means suggesting that Lee's intellectual integrity is in question, this is just useful context for readers to interpret the key messages from a book that can come across as very pro China. It directly challenges many people's long-held beliefs about China.

The current age of AI is defined by two great transitions: from discovery to implementation; and from expertise to data

Ever since the big technical breakthrough in deep learning in the mid-2000s, led by researcher Geoffrey Hinton, the flood of media attention on each incremental progress has led to a perception that we are constantly breaking fundamentally new ground in AI research. This, as Lee points out, is very misleading. Paradigm-shifting discoveries of this magnitude are few and far between. For example, tremendous progress in pattern recognition and autonomous driving does not signify rapid progress towards [general AI](#). We are in the age of implementation or stated another way - the application of breakthroughs in deep learning for solving everyday problems.

Successful AI algorithms are built on three pillars: big data, computing power and algorithmic-engineering talent. Of these three, data becomes increasingly important as we move further into the age of implementation. Simply speaking, an algorithm designed by a handful of mid-level AI engineers, when supported with much more data, usually outperforms one designed by a world-class expert. This is a world of quantity over quality.

As one famous phrase in the tech industry goes: “There is no data like more data”.

Advantage China

To create an AI superpower, Lee suggests that a nation needs to have four building blocks: (1) tenacious entrepreneurs (2) abundant data (3) well-trained AI scientists and (4) a supportive policy environment.

Entrepreneurship – disregarding Chinese tech companies as just copycats is overly simplistic and outdated

Lee’s diverse experience brings an acute understanding that Silicon Valley’s and China’s internet ecosystems grew from very different cultural soil. The prevailing Silicon Valley ideology is mission driven and techno-optimistic, believing that innovative thinking can truly change the world (Steve Jobs’ remark “dent in the universe”). In this environment, he asserts that copying ideas and product features is frowned upon and that lofty company mission statements can sometimes be a handicap, inhibiting adaptability when the market changes direction.

In contrast, according to Lee, Chinese companies are first and foremost market driven. The singular focus is about making a financial profit which results in incredibly flexible business models and swift execution (Deng Xiaoping’s remark: “It doesn’t matter whether it is a white cat or a black cat, as long as it catches mice, it is a good cat”). This is inherently linked to their life experience. Growing up, Chinese entrepreneurs’ parents didn’t talk to them about changing the world. Rather the conversation was about survival and earning enough money to look after families.

In this environment copying ideas and product features is common practice but Lee argues that it is way too simplistic to conclude that China’s internet entrepreneurs have a somewhat easier job and do not have to innovate. On the contrary, Lee postulates that Chinese entrepreneurs are facing the most cut-throat environment on the planet. Chinese group-

buying business Meituan didn't become a multi-billion-dollar enterprise by simply copying the idea from Groupon. Over 5000 companies did the same thing, including Groupon itself, when trying to enter the Chinese market.

This is an environment where competitors will stop at nothing to steal market share from each other. The only way to survive, Lee argues, is to constantly improve one's product but also to innovate around the business model, thereby building a *moat* around the company. While many companies in Silicon Valley can *coast* based on one original idea, China has incubated a generation of the world's most nimble and nose-to-the-grindstone entrepreneurs.

This is not a viewpoint that is easy for people outside China to accept. In this book, Lee doesn't give enough credit to Silicon Valley's proven model of creating generations of successful entrepreneurs. Maybe he thinks it is a given. The book is also limited in exploring the downsides of China's profit-above-all mentality. But the key point Lee tries to make is that corporate America is unprepared for this global wave of Chinese entrepreneurship because it has fundamentally misunderstood the secret of their success.

What Lee outlines is not a theoretical argument about the future. Not that long ago it was easy to refer to the rising internet stars in China as the "Twitter of China" or the "Amazon of China". These labels have stopped making sense in recent years. For example, Wechat is far more than the "WhatsApp of China". In fact, it is referred to as the world's first super app – the so-called "remote control of life". In addition, Shenzhen-based DJI is the unrivalled world leader in drone technology. Meituan, as mentioned earlier, has penetrated deeply into almost every corner of ordinary Chinese people's economic lives while Groupon, after its failed attempt to enter China, still largely follows its original group-buying idea.

It is easy to tell which one is the stock market's favourite. At the time of this review (July 2020), Groupon has a market cap of just over half a billion dollars while Meituan, its cloner, is valued at a jaw-dropping \$130bn.

Data – China's data advantage spans from quantity to quality

China is the Saudi Arabia of data. It is already ahead of the US as the world's largest producer of digital data and the gap is widening by the day, as Lee claims. China has a massive base of internet users, greater than the US and all of Europe combined. In the age of AI implementation, sheer volume of data is the single most important building block of a successful deep-learning algorithm.

Chinese internet companies also have access to better quality data than their American peers. In the US, it is all about online behaviours (eg searches, number of "likes" and videos watched). China's internet ecosystem is far more embedded in real-world activities. In China, people could hire others to wait in the famously long lines outside hospitals via an app. Lazy pet owner could use an app to hail someone who would come right over and clean out a cat's litter box or wash their dog. This is all supported by an unparalleled mobile payment system that has turned China into a cash-less society.

AI expertise – The US has an edge in elite expertise but the era of implementation rewards the quantity of solid AI engineers over the quality of elite researchers.

Lee uses mass electrification as an example to illustrate this point. Following Thomas Edison's harnessing of electricity, the field shifted from invention to implementation. Thousands of engineers began tinkering with electricity, using it to power new devices. Those tinkerers didn't have to break new ground like Edison. They just had to know enough about how electricity works.

In the race of quantity, China has an inherent advantage over the US given its much larger population. China has almost six times more computer science graduates than the US ([Bain](#)). Lee's Sinovation Ventures examined the top 100 AI journals and conferences from 2006 to 2015 and found that the percentage of papers by authors with Chinese names nearly doubled from 23% to 43% during that period.

Policy environment – a grand plan vs a hands-off approach

Lee postulates that Chinese governance structures are more complex and sophisticated than most Americans assume. It is particularly effective in mobilising epic resources to push in the direction of strategically important long-term goals. As an example, between 2007 and 2017, China went from having zero high-speed rail lines to having more than the rest of the world combined. Make no mistake, China is very determined to become an AI superpower.

Lee even compares the Chinese State Council's "Development Plan for a New Generation of Artificial Intelligence" to President Kennedy's landmark moon-landing speech. While the report lacked Kennedy's soaring rhetoric, he argues, it set off a similar national mobilisation and an all-hands-on-deck approach to national innovation.

This stands in sharp contrast to a US government that deliberately takes a hands-off approach to entrepreneurship and is actively slashing funding for basic research. Three months after President Trump took office, he proposed cutting funding for AI research at the National Science Foundation.

Lee also has an interesting take on the two countries' contrasting attitude towards moral challenges caused by adoption of AI. Self-driving cars make for a good example. The American system calls for a long and comprehensive debate, aiming to reach a moral consensus. Chinese political culture is more pragmatic. The mantra is you can't let the perfect be the enemy of the good. It is more willing to take risks to achieve broader social good while accepting that there will be downsides for certain individuals and industries.

A bi-polar new world order

Lee doesn't use this exact phrase in his book, but the message is clear: as far as the AI new world order is concerned, the world is fast approaching bi-polarity and the gap between the two AI superpowers and the rest of the world is widening every day.

Thankfully, with nuclear deterrents in place, an all-out conventional war between the US and China remains a tail risk. The battlefield of the two superpowers will likely move into cyber space in my view. AI has the potential to create cyberwarfare of unprecedented magnitude.

Outside the US and China, UK (home to DeepMind), France, Canada and a few other countries play host to top-notch talent and research labs, but Lee asserts that they lack the other ingredients needed to become true AI superpowers such as a large base of users and a vibrant entrepreneurial and venture-capital ecosystem.

[PwC](#) estimate that US and China are set to capture a full 70% of the US\$15.7tn that AI will add to global GDP by 2030, with China alone taking home US\$7tn. AI superpowers will harvest profits from markets around the globe. In Lee's view, American companies will likely lay claim to many developed markets while China's AI juggernauts will have a better shot at winning over Southeast Asia, Africa and the Middle East.

Developing countries are likely to end up being the biggest losers. The gap between the AI haves and have-nots will significantly grow. With manufacturing and services increasingly delivered by intelligent machines, located in the AI superpowers, developing countries will lose the one competitive edge that their predecessors used to kick-start development: cheap labour. These nations, as Lee warns, are in danger of becoming states of near-total dependence and subservience.

Coping with AI disruption and a blueprint for human coexistence with AI

That was only half the book.

While still insightful and a pleasure to read, I find messages from the second half of the book less unique compared to the razor-sharp analysis of the US-China AI rivalry. It joins an increasingly debated area of AI, namely its potential to disrupt the labour market and its coexistence with humans. Lee's views can be summarised as follows:

- AI is going to dramatically change the nature of human work
- The magnitude of this change is unprecedented, both in terms of the speed at which it will happen and of the consequences on our social systems. Mass unemployment is a real possibility
- Unlike previous disruptions (eg industrial revolution), white-collar workers will be negatively affected first by advances in AI (building an algorithm is far easier than building a robot)
- Universal Basic Income is not a constructive solution. It is a painkiller to numb and sedate the people who have been hurt
- Lee proposes a social investment stipend that rewards socially beneficial activities
- Human actions are the single most important factor in shaping the future of AI and human's ability to love and care for each other is unattainable by AI.

Investment implications

No single factor dictates the shape of the world order. And yet some factors are more important than others. AI's role in enhancing productivity and military applications makes it a powerful one. Just as the industrial revolution powered Great Britain to a global hegemony in mid-18th century, the upcoming AI revolution has the potential to push China to catch up with

– and possibly surpass – the US. Investors should take note and think about their asset allocation against this backdrop, in a global capital market that is still very US centric.

AI's tendency to create monopolies will exacerbate leading technology companies' ability to produce economic-law-defying profit margins. More trillion-dollar companies will emerge in this space, possibly more in China than in the US. However, as these firms exploit technology to enrich their shareholders, the pressure for wealth redistribution will continue to grow to address the societal disruptions brought about by it.

The outlook for emerging markets seems grim. Added to their technological inferiority is the fact that many emerging markets are in areas where climate change is likely to cause the greatest impact. Many of them may fail to actually emerge. Investment strategists need to have this uncertainty in mind. One thing is clear though. For investors who still use the emerging market "bucket" to access China, it is time to re-think their asset allocation framework. The new world order is on the horizon, if not already here.

What is the final verdict?

There are some who know the US better than Lee and others who know China better, but few will have better AI perspectives on both than him. Lee's views on the US-China AI race and what it means for the geopolitical world order need to be taken seriously, regardless of ideological preferences.

It is an easy and enjoyable book to read and some of the tech company war stories are almost fiction like. This book should appeal to those interested in China and, equally, to those eager to learn about the future of AI technology.

It took me only two weekends to finish the 232-page-long book (and English is not even my first language), but if you are looking for a short-cut (in addition to this book review), Lee's brilliant [TED talk](#) effectively summarises this book. At only 15 minutes long, it is well worth the time.

About the Thinking Ahead Institute

The [Thinking Ahead Institute](#) is a global not-for-profit member organisation whose aim is to influence change in the investment world for the benefit of savers. The Institute's members comprise asset owners, investment managers and other groups that are motivated to mobilise capital for a sustainable future. It has over 40 members with combined responsibility for over US\$12 trillion and is an outgrowth of Willis Towers Watson Investments' Thinking Ahead Group.