

Book Review

Humanity in the Age of Data

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*Kai-Fu Lee- AI Superpowers: China, Silicon Valley
and the New World Order, 2018,
Houghton Mifflin Harcourt, Boston, United States*

"When asked how far China lags behind Silicon Valley in artificial intelligence research, some Chinese entrepreneurs jokingly answer "sixteen hours"—the time difference between California and Beijing."

This book is addictive from the first page, and is truly one of those volumes that deserve to be read cover to cover. Despite the extensive global interest in China, there are very few books that convey the ground story of Chinese entrepreneurship in digital technology. In fact, even on the subject of Artificial Intelligence (AI), much of the non-technical, analytical literature has started to emerge only from the latter half of 2018. Kai-Fu Lee's credentials as a world-renowned AI pioneer, along with his wide experience of having worked at the top level, both in the United States and China, make this book a highly recommended read. His straightforward and witty writing style makes no ideological or geopolitical judgments, but conveys his passion for technology and desire to direct it towards enhancing human life.

The most important contribution of this book is in offering a classification of AI technologies, what Lee calls the four waves of AI-- Internet AI, Business AI, Perception AI and Autonomous AI. According to Lee, while China and the US rank nearly the same in internet AI (using search data to make recommendations), China lags behind the US in

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business AI as Chinese companies do not have standardised data storage or enterprise software. The US on the other hand, has lots of structured data that can be mined for better decision making. However, Lee denotes Perception AI as the most revolutionary as through the proliferation of sensors and smart devices it will not only merge the online and offline worlds but also lay the ground for autonomous AI, which is currently some decades away. In Perception AI, China enjoys natural advantages with a flourishing hardware ecosystem such as in Shenzhen that is a one stop shop for innovators looking for suitable gadgetry.

In an interesting outlook, Lee is unapologetic about the copycat label attributed to Chinese companies. According to him, the 'trial-by-fire competitive landscape' in China that sees thousands of mimicking competitors, has forged 'gladiator entrepreneurs' in the socialist market economy. The book recounts the fierce public battle between Tencent and Qihoo in 2010 that saw aggressive smear campaigns, forcible de-installing of competing software, reporting of rival CEOs to the police, and ended with the Chinese government stepping in to separate the combatant companies. Lee's point here deserves greater attention that while the West may see Chinese companies as mere copies of Twitter, Groupon or Uber, these companies by virtue of constant innovation and endless tweaking of business models under tight profit margins have become ready for global competition. Lee further explicates how the cultural acceptance of copying (a legacy of imperial bureaucratic examination), a scarcity mentality (emanating from the tough decades after 1949), and the willingness to dive into any promising new industry has further hardened the psychological foundations of China's internet ecosystem.

A unique feature of China's digitalisation has been the late introduction of the internet that spread like wildfire in China in the smartphone era, nearly skipping the laptop era. This fact, though very often unstated, is what has defined the unique Chinese digital ecosystem. It's thus not a surprise that the biggest social media network (Weixin or WeChat) in China started as an app rather than a website, later becoming a super app that combined functionalities of multi-purpose messaging, social media and mobile payment into one app. China also plugged into the digital race when digital tech was undergoing its once in a lifetime breakthrough, especially in AI. Geoffrey Hinton's groundbreaking paper in 2006 on neural networks coincided with the growth of computational power and available data that unlike previous decades opened the floodgates for AI development. However, China became truly hooked on to the new technology after, what Lee calls was, China's Sputnik Moment. During a five-game series

in March 2016, AlphaGo scored its first high-profile victory against the legendary Korean player Lee Sedol, winning four to one. While barely noticed by most Americans, the five games drew more than 280 million Chinese viewers and started the AI craze in China almost overnight.

In comparing Silicon Valley and China, Lee is slightly biased in attributing an overtly principled approach to Silicon Valley, where enterprises are divorced from market competition and the first mover enjoys all the advantages. He argues that as the erstwhile 'Age of discovery' has made way for the 'Age of implementation' and the 'Age of expertise' for the 'Age of data', China has the essential four building blocks of becoming an AI superpower- abundant data, tenacious entrepreneurs, well trained AI scientists and supportive policy environment. Consequently, despite shortcomings in fundamental coding, China being the largest producer of data (even ahead of the US) is most suitably placed for growth of AI. Thus, the emphasis on innovation is not so much on scientific breakthroughs but providing integration and efficiency of existing services (sometimes even blurring the online and offline worlds). Also, the ethical questions in AI such as those regarding self-driving cars are not a roadblock in China as they are in the West.

Another prominent difference between the Silicon Valley and China is the 'grid approach' of western companies vs. the 'battery-powered approach' of Chinese companies for building products for specific use. According to Lee, the American internet companies tend to take a "light" approach. They generally believe the internet's fundamental power is sharing information, closing knowledge gaps, and connecting people digitally. In comparison, Chinese companies tend to go "heavy." They don't want to just build the platform—they want to recruit each seller, handle the goods, run the delivery team, supply the scooters, repair those scooters, and control the payment. And if need be, they'll subsidise that entire process to speed up user adoption and undercut rivals. Further, Chinese companies have also not been shy of accepting tough challenges such as building their own chips. Video-gaming companies such as Nvidia now leverage their graphics processing strengths to build chips for the new era of machine learning. One should not be surprised that between 2016 and early 2018, Nvidia's stock price multiplied by a factor of ten.

Another interesting insight is that since China entered the internet age in the era of smartphones, it enjoys mammoth advantages in mobile payments with Chinese mobile payment spending outnumbering that in the US by a ratio of fifty to one. Rather

than investing in point-of-sale (POS) devices, every small business/ shop just prints out a picture of a QR code linked to its WeChat Wallet. Customers then use the Alipay or WeChat apps to scan the code and enter the payment total, using a thumbprint for confirmation. The Chinese government has offered unprecedented support to its domestic AI industry through rebates on research expenses, government contracts for facial recognition and autonomous robot technology, simplified procedures for registering a company, seed funding, office space, etc. However, the sheer scope of financing and speed of deployment almost guarantees that there will be inefficiencies. Government bureaucracies cannot rapidly deploy billions of dollars in investments and subsidies without some amount of waste. By brute-forcing the economic and technological upgradation of China, the potential upside of that transformation is large enough to warrant making expensive bets on the next big thing.

In the last four chapters, Lee explains at length why an apocalypse due to AI may be far-fetched. But he doesn't hesitate to say that AI's greatest potential to disrupt and destroy lies not in international military contests, but in what it will do to labour, social systems and in reinforcing inequality. Whereas the Industrial Revolution took place over several generations, the AI revolution will have a major impact within one generation making readjustment very difficult. Further, the physical automation of the past century largely hurt blue collar workers, but the coming decades of intelligent automation will hit white collar workers first. Lee makes limited mention of the tradeoffs governments will need to address, namely data privacy, digital monopolies, online security and algorithmic bias. He also makes a partial reference to the control problem or value alignment problem of AI where it may not hesitate in eradicating humanity towards achieving its instructed goals in the most efficient way possible. Yet, Lee is optimistic that the end of post-industrial revolution world may inevitably make us more humane by bringing out our core traits of being caring and creative.

One can only conclude by referring to Lee's own concluding quote: *'Let us choose to let machines be machines, and let humans be humans. Let us choose to simply use our machines, and more importantly, to love one another'*.