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SPECIAL “PARTY-BUILDING” EDITION OF THE XIMALAYA FM XIAOYA SMART SPEAKER, DEVELOPED IN PARTNERSHIP WITH THE CCP.

CHINA.AI

人工智能.中国 | Gabriele de Seta

From the second half of the 2010s, artificial intelligence has become a major hype across Chinese tech industries, venture capital investment and government policy. The BAT national champions (Baidu, Alibaba and Tencent) have invested heavily in AI research and development, opening research centers in China and abroad to attract global talent, while thousands of startups have benefited from AI hype to attract investment and reap the benefits of generous government funding. In a wave of innovation rhetoric closely resembling the previous hypes around Web 2.0 and Big Data, AI has become the most recurring buzzword in Chinese tech: besides its more predictable applications (industrial automation, self-driving cars, natural language processing and computer vision), almost everything in China—from e-commerce platforms to public utilities—is being revamped as an ostensibly "AI-powered" service. Drawing on research into the development of artificial intelligence technologies and products, this chapter charts China's AI hype via its representation across government policy documents, industry advertisement, commercial products and popular culture. As trends and catchphrases travel between corporate boardrooms and policy think tanks to propaganda materials and music videos, the interplay between technical innovation and planned development reveals how AI is constructed, in real time, at the intersection of sociotechnical constraints and national imaginations.

AI LOVE

In December 2017, Taiwanese-American pop singer Wang Leehom released his 16th album A.I. Love. Blending a mid-tempo EDM beat with autotuned vocals, the title track "A.I. Love" is a catchy play on the homophony between the AI acronym and the Chinese term for "love"—爱 *ai*. The track's music video opens with a flyover shot of the fictional Daode Research Laboratory, where a scientist in a lab coat is activating a female android with an injection of a pink liquid.

The actor portraying the scientist is a guest of honor: Taiwanese-American venture capitalist and AI mogul Kai-Fu Lee, who in the following scene brings the now operational cyborg to Wang Leehom's apartment. The singer and the android get married and get on with their awkward love life, which includes playing a game of *go,* watching movies, singing karaoke, reading books in bed, taking selfies and eventually zooming across a neon-lit Taipei in a sports car. Wang Leehom's Mandarin lyrics explore the dichotomy between AI and *ai* ("Love, is just one word / but for thousands of generations, humans still don't understand it / but A.I. can solve all our problems") while also describing a stereotypically gendered artificial intelligence ("everyone wants a perfect lover / that gives a shoulder massage at any time"). Even when the contradiction is resolved ("artificial intelligence finally has perfected love / just don't challenge


道德 得到 道德
ethics, attain ethics


但別挑戰它下棋
just don't challenge it in go


誰都想擁有最完美的情人
everyone wants a perfect lover

it at *go*") and cyberian superiority is accepted ("no longer worry about the world's problems / it will colonize Mars"), one question remains open: "but where do ethics go? Where do ethics go? Where?"

In its four-minute run time, "A.I. Love" encapsulates the major talking points of the hype around AI in China—computational solutionism, autonomous non-human cognition, and uncharted ethical implications. Besides the common sci-fi trope of the gendered AI, Wang Leehom's song features a key element of Chinese AI history: *go,* an abstract strategy game invented in ancient China and notoriously more complex than chess for neural networks to master. In March 2016, the AlphaGo program developed by Google DeepMind beat Lee Seedol—the South Korean 18-time world champion—over five games of *go.* Echoing the historical chess defeat of Gary Kasparov at the algorithmic hands of DeepBlue in 1997, the AlphaGo vs. Lee match spurred the South Korean government to invest 1 trillion KRW in AI research; livestreams of the five games were spectated by more than 280 million Chinese viewers and made a deep impression on the country's technological imaginary. As Kai-fu Lee himself writes, "Overnight, China plunged into an artificial intelligence fever. The buzz didn't quite rival America's reaction to Sputnik, but it lit a fire under the Chinese technology community that has been burning ever since" (2018). The importance of this quasi-Sputnik moment is confirmed by the reaction of Chinese authorities to the *go* match between AlphaGo and current world champion Ke Jie more than a year later in Wuzhen, China. Likely concerned by the implications a defeat of a Chinese *go* player by an American AI would have had on national pride (Ding 2018), government authorities forbade local websites and platforms to broadcast the match in any form, including "text commentary, photography, video streams, self-media accounts and so on" (Huang 2017). In spite of this ban—which was eventually lifted in September 2018—Chinese audiences managed to find creative ways to follow the match as it happened, either by circumventing censorship and accessing foreign platforms, or by replaying the game moves on their own *go* boards.

BEATING HEARTS AND THOUSAND-MILE EYES

Despite his Taiwanese family heritage and his American origins, Wang Leehom has successfully tapped into the global circulation of a transnational Chinese identity by becoming a major Mando-pop star, and this is why a track like "A.I. Love" appears, on a surface reading, to be an ecstatic paean to Chinese AI. Similar transnational connections behind the construction of national technological imaginaries are exemplarily embodied by Kai-Fu Lee. Born in Taipei in 1961, Lee emigrated to the US in 1973 and got his PhD at Carnegie Mellon fifteen years later, with a thesis on his development of the world's first speaker-independent continuous speech recognition system. After working as a research scientist for Apple, Lee moved to Beijing in 1998, where he acted as the founding director of Microsoft Research Asia, a leading hub of global next-generation computing research; he then served as president of Google China before the company exited from the Chinese market in 2010. The author of inspirational books loved by Chinese readers and a widely followed celebrity on Chinese

COVER OF KAI-FU LEE AND YONGGANG WANG'S BOOK *ARTIFICIAL INTELLIGENCE IS HERE*.

social media, in 2009 Lee established Sinovation Ventures, an investment firm co–located in Beijing, Shanghai, Shenzhen, Seattle and Silicon Valley with a portfolio of more than 300 companies. Many of Lee's enterprises testify to his lifelong pursuit of innovation in artificial intelligence: Microsoft Research Asia's agenda includes the development of speech recognition, computer vision and AI; Sinovation Ventures invests heavily in machine learning and AI companies. Given his transnational background and eclectic career, it is somewhat surprising to read Lee's recent formulation of a threatening "AI race" between China and the US that would result in the supremacy of one "AI superpower" dominating the 21st century (Lee 2018).

It is undeniable that, via the bridging efforts of tech executives and investors like Kai–Fu Lee, China has become a world–leading center of AI research. According to Lee, in particular, Beijing's Zhongguancun district is today "the beating heart of China's AI movement" (2018): besides Microsoft Research Asia, the district hosts the Baidu Research lab (also co–located in Silicon Valley and Seattle) which in 2014 was the first institute set up by a Chinese tech company to explicitly focus on AI research and development, and leading AI chip design firm Cambricon. Sinovation Ventures itself, also based in Zhongguancun, established its own AI Institute in 2016. But besides this beating heart of Beijing, the geography of Chinese AI development revolves around the major urban centers where the other BAT companies are located. One after the other, the BAT companies have all opened their own AI research institutes: Tencent founded its AI Lab in 2016, co–located between Shenzhen and Seattle; one year later, Alibaba's Jack Ma inaugurated his DAMO academy, based in Beijing, Hangzhou, Singapore, Israel, San Mateo, Bellevue and Moscow. Other massive tech companies and startup unicorns also cluster around Chinese metropolitan areas: ByteDance, based in Beijing, relies on machine learning and AI to provide personalized content to users of its apps Toutiao and Douyin; Huawei, which has recently unveiled a full–stack AI portfolio and a mobile AI chip, has opened its Noah's Ark Labs in Shenzhen, Hong Kong, Dongguan, Shanghai and Xi'an; YITU Technology, based in Shanghai, is one of the global leaders in AI–powered machine vision. Other cities and provinces are following the lead of China's research hubs and channeling government funding into AI initiatives and innovation parks, building on locally available expertise and data labor (speech recognition in Hefei, optics in Wuhan, and so on). The spatial geography of AI also evidences center–periphery tensions and inequalities: for example, leading Hong Kong–based machine vision startup SenseTime has participated in a joint–venture deploying AI–powered surveil–lance technologies in Xinjiang province, partly realizing the government's vision of a "thousand–mile eyes" system overseeing ethnic and religious minorities in the area (Chang 2018).

DATA AS OIL, POLICY AS PIPELINE

The most widely used Chinese term for artificial intelligence is the direct translation *rengong zhineng* (人工智能), which encompasses a broad range of technologies including core AI technologies (such as machine learning and natural language processing) and AI–related products (such as smart speakers

TOP: Still from Xi Jinping’s 2018 New Year speech.

BOTTOM: These two books about artificial intelligence appear on President Xi Jinping’s bookshelf.

and recommendation systems). The hype around AI is clearly evidenced by the proliferation of *rengong zhineng* as a prefix added to commercial products and services—everything in China seems to have suddenly become AI-powered, from real estate investment to public toilet management. As briefly chronicled in the previous section, the Chinese AI industry saw rapid growth in the second half of the 2010s. It is widely argued that China's distinct competitive advantage in the field results from four factors: its pre-existing Internet industry, a large pool of talent, a massive mobile internet market, and supportive government policies. The first three factors feed into one of the most pervasive images behind China's AI boom: a competitive advantage on data collection, extraction and exploitation. If artificial intelligence is the new electricity—as Chinese-American computer scientist Andrew Ng provocatively puts it (Lynch 2017)—data is the oil necessary to generate it, and China is the "Saudi Arabia of Data" (Lee 2018). But massive reserves of (dubiously gathered and processed) user data are not enough to propel the Chinese AI industry to its much sought-after global lead: as in many other areas of technological innovation, the role of government policy is central. Since 2016, the Chinese government has proactively supported the development of a national AI industry through whitepapers, policy guidelines, implementation plans and "government guidance funds" (Feng 2018). These documents and stimuli directly influence global investors, Chinese companies and local governments, steering the development of the national AI industry.

When President Xi Jinping addressed the nation for his customary New Year speech in 2018, careful observers noted that his bookshelves displayed new additions to his collection, including two volumes on artificial intelligence: Pedro Domingo's *The Master Algorithm* and Brett King's *Augmented* (An 2018). Alongside political signaling and propaganda materials, policy documents related to AI are regularly touted in the international press as examples of the Chinese government's enthusiastic endorsement of this technology and its aspiration to successfully lead the global AI race. But even a quick look at some of the major milestones in Chinese AI policy reveals how policymaking often oscillates between vague commitment and playing catch-up with emerging technologies with unclear future implications. In the "Outline of Medium and Long-term Plan for National Science and Technology Development (2006-2020)," the State Council identified information technologies as one of eight areas of advanced technologies to support—AI here is just one entry in a sub-list.

It was only with the "13th Five Year Plan for Developing National Strategic and Emerging Industries (2016-2020)" that the State Council explicitly identified AI as one of several emerging technologies of strategic interest and outlined five agencies tasked with AI policy development. More specific plans—mostly released during and after 2016, the "Sputnik year" for Chinese AI—connect AI development to existing policy frameworks such as the "Internet Plus" plan, the robotics industry or the recently abandoned "Made in China 2025" plan. The 2017 "Guideline on Developing Artificial Intelligence (New Generation of Artificial Intelligence Development Plan)" is perhaps the most widely quoted Chinese AI policy document, as it set the lofty goals of achieving noticeable

TOP: An augmented reality Tai Chi lesson at the *smart park* powered by Baidu's DuerOS in Haidian District, Beijing

BOTTOM: AI for endangered species protection, Intel x WWF advertisement, Beijing Capital International airport.

progress by 2020, establishing a competitive industry and comprehensive policy by 2025, and commanding a world–leading role as global innovation center by 2030. By outlining areas of industry growth, nudging technological development and channeling investment flows, policymaking shapes how Chinese AI is perceived around the world, cementing a narrative of grassroots enthusiasm and competitive advantage propelling China onto the global stage.

CHINA HAS DEVELOPED AN AI THAT…

Besides investor meetings, startup incubators and policy working groups, AI is increasingly present in Chinese everyday life—hidden behind app interfaces, touted by advertising and accessed as a service via public terminals or mobile devices. The most central AI product is cloud computing: BAT companies have integrated AI solutions in their cloud computing platforms (Alibaba Cloud and PAI, Baidu's ABC–Stack, Baidu Cloud and Baidu Brain, Tencent's Angel and AI cloud), and other companies like Huawei and iFLYTEK have developed both general AI development platforms and service–specific portfolios. Cloud computing allows third–party companies to offer AI–based services that can be accessed by networked consumer devices. Some of these services, such as AI–powered assistants, smart speakers and voice recognition, have already become integrated into everyday computing, with tech companies competing to occupy market niches like shopping assistants (Alibaba's Ali Xiaomi and Dian Xiaomi), conversational interfaces (Baidu's DuerOS, Huawei's HiAssistant, Tencent's Xiaowei, iFLYTEK's VoiceTouch) and smart speakers (Baidu's Raven H, Alibaba's Tmall Genie X1, Tencent's Ting Ting). Other services, including machine vision, logistics and autonomous driving, remain either confined to the domain of policing and surveillance (such as SenseTime's various video analysis, feature tracking and identity verification products), under experimentation in factories and distribution centers (such as JD.com's fully automated warehouses, Meituan's dispatch system or Cainiao's smart supply chain) or still in the stage of early development (such as Baidu's Apollo, an open–source autonomous driving OS).

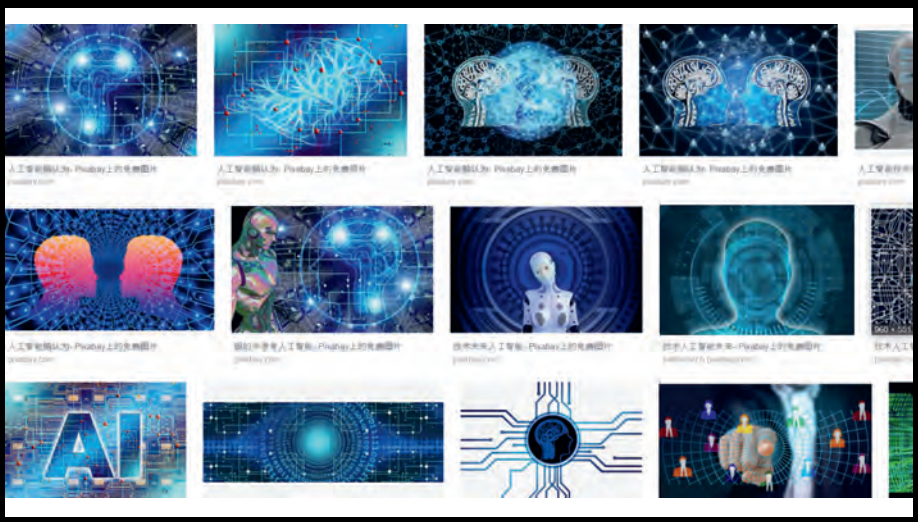
The public front of the Chinese AI industry is easily readable in advertising and tech demos. Artificial intelligence—often embodied by sleek cyborg figures similar to the android protagonist of the Wang Leehom video or by glowing, brain–shaped nodal networks—appears in the advertising of a large range of products, from "AI–capable" consumer electronics to "AI–powered" apps and services. Countless tech demos offered at industry conventions and tech fairs are circulated via short videos and online advertisement on social media platforms, but companies also compete for consumer attention by showcasing their AI products via installations in public spaces and flagship stores. The various examples of self–checkout stores opened across Chinese cities propagate the vision of an AI–powered "new retail" achieved by a combination of machine vision (for both face and product recognition), RFID and cashless mobile payments. Qiu Hao and Xin Xiaomeng, the two "AI news anchors" (the first male, the second female) unveiled by Xinhua News Agency between late 2018 and early 2019, are successful examples of the everyday marketization of AI: developed

AI ANCHORS QIU HAO AND XIN XIAOMENG: FROM NEW CHINA TV YOUTUBE CHANNEL.

by Xinhua in collaboration with Chinese search engine company Sogou, these AI news anchors are ultimately a speech synthesis software capable of reading news scripts combined with a realistic digital rendering of two actual Xinhua journalists, but they successfully embody China's AI aspirations for both national and international audiences. The AI hype doesn't seem limited to retail and media industries: the "AI Park" opened in Beijing's Haidian District in late 2018 is powered by the Baidu DuerOS and offers augmented reality Tai Chi lessons and unmanned shuttles while tracking its visitors with sensor–paved walkways and face recognition cameras. As AI is reduced to the visible implementation of surveillance technologies for consumer–friendly social control—epitomized by face recognition toilet paper dispensers and automated jaywalker–shaming roadside displays—everyday life becomes increasingly mediated by less visible forms of automation and computation.

IT'S ABOUT ETHICS IN AI DEVELOPMENT

In the wake of Ke Jie's defeat by AlphaGo, China's Ministry of Science and Technology appointed companies like Baidu, Alibaba, Tencent and iFLYTEK as its "National Champions," encouraging them to apply their own expertise to the development of next generation AI products and services. Among these prod–ucts, it is notable how some companies came up with their own *go* programs, bringing the gaming competition back to its home turf: Tencent's own Fine Art program defeated Ke Jie in January 2018, and Beijing Thinker Technologies' Golaxy program replicated the same feat in April 2018. But beyond the *go* craze, the Chinese AI industry has undeniably succeeded in branching out into different domains from healthcare to the military, challenging the US's techno–logical leadership and unsettling preconceptions about Chinese innovation. As analysts warn against the massive loss of Chinese jobs potentially brought by automation, and market observers dispel myths about Chinese users not caring about personal privacy and data collection, the question of AI ethics emerges as the latest industry–wide hype. In May 2019, the Beijing Academy of Artificial Intelligence (BAAI) in collaboration with various universities and tech companies released the "Beijing AI Principles" (2019), a document detailing fifteen ethical guidelines for the development, use and governance of AI systems and products. This effort follows the first steps taken by multinational companies and interna–tional organizations in Europe and the US to lay down ethical standards for AI; at the same time, it allows China to plug its policy vision of a "human community with a shared future" via widely agreeable principles of sociotechnical *daode* (ethics). This conflation between an industry trend and a governmental keyword exemplifies the convenient alignment of different temporalities: in the Beijing AI Principles, a foreign policy concept proposed by former Chinese president Hu Jintao and championed by current president Xi Jinping (the "community of common destiny") underpins the recommendations for an ethical development of artificial intelligence technologies. After all, Wang Leehom's music video opens with a scene inside the Daode Research Laboratory, and its refrain "Where do ethics go?" finds in these efforts a tentative answer.



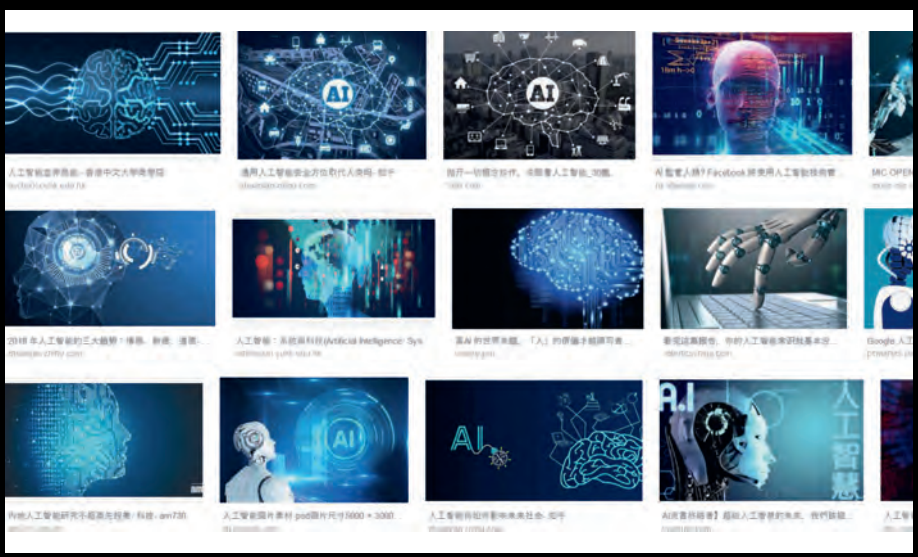


IMAGE SEARCH RESULTS FOR 人工智能 (ARTIFICIAL INTELLIGENCE) ON BAIDU (TOP), AND GOOGLE (MIDDLE AND BOTTOM), JULY 3, 2019.

REFERENCES

An, B. 2018. “Xi’s bookshelf illustrates goal of developing AI powerhouse.” Retrieved August 12, 2019, from Chinadaily.com.cn website.

Beijing Academy of Artificial Intelligence. 2019. “Beijing AI Principles.” Retrieved August 12, 2019, from Beijing Academy of Artificial Intelligence website.

Chang, A. 2018. “Zhongyang Zhengfawei mishuzhang: Quebao 2020 shixian gonggong jiankong quanyu fugai” [Secretary General of the Committee of Political and Legal Affairs: Ensure comprehensive public surveillance coverage by 2020]. Retrieved July 1, 2019, from Sina News website.

Ding, J. 2018. *Deciphering China’s AI Dream: The Context, Components, Capabilities, and Consequences of China’s Strategy to Lead the World in AI,* 1—44. Oxford: Future of Humanity Institute, University of Oxford.

Feng, E. 2018. “China’s State–owned Venture Capital Funds Battle to Make an Impact.” Retrieved July 1, 2019, from *Financial Times* website.

Huang, Z. 2017. “An epic man–against–machine tournament is taking place in China but Chinese viewers can’t watch it live.” Retrieved July 1, 2019, from Quartz website.

Lee, K. 2018. *AI Superpowers: China, Silicon Valley, and the New World Order.* New York: Houghton Mifflin Harcourt.

Lynch, S. 2017. “Andrew Ng: Why AI is the new electricity.” Retrieved December 26, 2018, from The Dish website.