

THE CHINA DREAM GOES DIGITAL: TECHNOLOGY IN THE AGE OF XI

ABOUT

The Chinese have long been obsessed with strategic culture, power balances and geopolitical shifts. Academic institutions, think-tanks, journals and web-based debates are growing in number and quality, giving China's foreign policy breadth and depth.

China Analysis introduces European audiences to these debates inside China's expert and think-tank world and helps the European policy community understand how China's leadership thinks about domestic and foreign policy issues. While freedom of expression and information remain restricted in China's media, these published sources and debates provide an important way of understanding emerging trends within China.

Each issue of *China Analysis* focuses on a specific theme and draws mainly on Chinese mainland sources. However, it also monitors content in Chinese-language publications from Hong Kong and Taiwan, which occasionally include news and analysis that is not published in the mainland and reflects the diversity of Chinese thinking.

Introduction

by François Godement

Developments in the digital and artificial intelligence arenas in China have attracted so much hype abroad that it is sobering to read more modest assessments from Chinese sources themselves. “Catching up” with the United States, whether in AI or in its military-related developments, is still the order of the day according to the sources examined by Elsa Kania, one of the contributors to this edition of *China Analysis*. Bureaucratic silos and unspecified societal obstacles impede the interconnection of data, according to sources studied by Katja Drinhausen, who also picks up on Chinese observers' warnings about the decentralised communications that social media allow. They believe China should ‘copy’ international content filtering practices. The social credit system (社会信用体系 shehui xinyong tixi), according to Adam Knight's sources, is an extension of credit rating and a purported answer to the lack of trust that exists between individuals in China. It introduces a nationwide 18-digit code for all individuals who are rated according to their integrity or trustworthiness. Like all big IT projects, the programme has its glitches – you can still be punished for all sorts of social activities if the system has not correctly registered that you have settled a debt, for example. The sources reveal among Chinese academics for streamlining the system and unifying its benchmarking. To them, the social credit programme perhaps does raise some issues about privacy. Marcin Przychodniak cites other concerns: the digital age brings worries about jobs in manufacturing and

services; and China's top-down strategic planning has the advantage of quick mobilisation of resources, but it works against the market-driven spread of most digital processes.

Still, a unifying trend in commentaries should not be taken lightly: this is indeed another way for China to be restored to its original first place under heaven. Interconnected with the China 2025 strategy, this approach is about making China "a major cyber power", and it is also about China's capacity to shape the international governance of cyberspace according to its own interests. Some compare the digital revolution under way and the deepening Sino-American competition as a new arms race. In a compendium of 14 short utterances on AI by Xi Jinping, the character for "strength" appears 12 times.

The mainstream of experts labours under contradictions that come from two very different directions. On the one hand, market forces, and the fragmentation and individualisation that social media allow, seem to militate towards a free and only lightly regulated exchange. Thus, there is concern that top-down planning is inadequate to the task of identifying winners and finding the right innovations. But when they look at the political side of things, the experts point to the need for even more control and regulation. This is clearly the case for social credit. They approve of the importance of *chengxin* – "integrity" – but they do not examine closely what "integrity" implies in a widely authoritarian context. Similarly, some experts lament that there is not enough big data interconnection, despite the fact that China is at the forefront of usable data-sharing. This is true of giant companies that cut across several sectors – from retail to banking and social media – and therefore amass huge in-house amounts of marketing data. And it is, of course, also true of the party-state, whose control is apparently unmentionable by experts, except to ask for more of it.

Thus, while the experts point to dilemmas that are familiar to other societies living through the digital age, their very silence or unquestioned approval in some areas show how the debate about digital governance remains politically constrained. They deal with this tension only in a functional sense, with some experts mentioning that the spread of information and online chat creates an obligation for government authorities to become more responsive, or face online and offline criticism. Even then, Chinese writers emphasise the perils of freedom, rather than the dangers of overwhelming control.

China's digital revolution

Katja Drinhausen

New information technologies – such as big data, platforms, new media, cloud computing and artificial intelligence – permeate almost every aspect of life today; as a result, the digital revolution under way is reshaping the economy, society, and governance. This chapter will consider the emphasis that Chinese scholars place on the digital economy and cyberspace as new areas of global competition. They agree that China – a latecomer to the past two industrial revolutions – now has a historic opportunity to take the lead in this new round of transformative change.

China is home to the highest number of internet users worldwide: more than 800 million Chinese citizens are connected to the internet.¹ This represents just over half of the population, but numbers are rising fast and existing users make extensive use of digital technologies and mobile access for information, communication, payment, e-commerce, and transport. This has opened up new avenues for economic activity, but also brought about regulatory and political challenges. Against this backdrop, strategies and instruments to foster stable growth and to secure China's position as a global leader are both key topics of scholarly and political debate.

Leading the new wave of global change

Drawing on domestic and international media and organisations to support his case, Wang Yufeng, researcher at the Institute of Economics, Chinese Academy of Social Sciences (CASS), argues that China is surging ahead in the digital economy (数字经济 *shuzi jingji*); "digital economy" here refers to the integration of internet-based technologies into all aspects of the economy.² New business models build on digital platforms and the sharing economy in areas such as mobile payment, shared transport, and e-commerce have greatly reduced marginal costs and emerged as strong contributors to China's economic growth. In Wang's view, a variety of factors have contributed to this success: Chinese businesses profit from the large and partially protected Chinese market and the rising number of internet users there. Tech giants such as Baidu, Alibaba, and Tencent have flourished in this environment and created a homegrown digital ecosystem for new enterprises. Large numbers of well-educated graduates help sustain this development and further innovation.

According to Wang, state policies also play a central role in establishing the required digital infrastructure for what

¹ "China Focus: China has 802 million internet users", *Xinhua*, 21 August 2018, available at http://www.xinhuanet.com/english/2018-08/21/c_137405424.htm.

² Wang Yufeng (王砚峰), "China's digital economy and the new wave of global change" (中国的数字经济与新的全球变革浪潮), *Macroeconomic Trend Monitor* (经济走势跟踪), volume 68, September 2017, available at http://ie.cass.cn/academics/economic_trends/201709/t20170928_3655627.html.

is essentially a new global competition in cost reduction in communications, production, and transport. The Chinese government has understood the importance of the digital economy and included specific goals and measures for its promotion in the 13th Five Year Plan; it has also formulated a number of policies, most importantly the “Internet+” strategy (“互联网+”行动计划 huliangwang jia xingdong jihua). The formulation of the “Internet+” action plan was first proposed by Chinese premier Li Keqiang during the third session of the 12th National People’s Congress in March 2015, with the aim to promote the integration of mobile internet, cloud computing, big data, and “internet of things” with modern manufacturing, and support the development of e-commerce, internet industry and finance as well as to guide Chinese internet companies’ expansion in the international market.³ Wang notes that this proactive approach differentiates China from the United States and more resembles policies adopted by the European Union and Germany. Not only is China leading the way in adopting new technologies as a result, says Wang, but Chinese enterprises and investments in the digital economy are increasingly going abroad, which in turn raises China’s international influence in setting standards.

Digital economy as the driving force in economic restructuring

Du Qinghao, deputy director and senior engineer of the Office of Information Management, Department of Information Technology, Chinese Academy of Governance, also believes China is at the forefront of new global developments.⁴ China has the fastest-growing digital economy worldwide and related sectors already account for more than a third of the country’s GDP. Du sees the development of the digital economy as a precondition for high value-added growth and as a key factor in China’s economic restructuring. He believes that internet-based technologies are crucial in optimising production and reducing overcapacity, in rebalancing sectors and modernising agriculture, as well as in stimulating domestic consumption, thereby addressing China’s biggest economic weaknesses.

But China also faces challenges on its way to becoming a global leader in the digital economy. Du regards institutional and social barriers as the main impediment for the interconnection of data that fuels the digital economy. The progress of digitisation in different industries and sectors is uneven, as investment and development are still focused on improving consumption rather than enhancing efficiency in production and agriculture. Likewise, there is a stark regional imbalance in access to and the adoption of internet-based technologies, with growth concentrated in eastern China, especially the Pearl Delta, while western regions lag behind, says Du.

3 On 1 July 2015 the State Council issued the “Guiding Opinions of the State Council on Vigorously Promoting “Internet Plus”” (关于积极推进 “互联网+” 行动的指导意见 guanyu jiji tuijin “huliangwang jia” xingdong de zhidao yijian), available at <http://en.pkulaw.cn/display.aspx?cgid=250823&lib=law>.

4 Du Qinghao (杜庆昊), “On Building a Powerful Nation in Digital Economy” (关于建设数字经济强国的思考), *Administrative Reform* (行政管理改革), volume 5, June 2018, available at http://ex.cssn.cn/dzyx/dzyx_xyzs/201806/t20180614_4366165.shtml.

Nonetheless, he sees unprecedented opportunities for China and echoes Wang in noting the importance of government plans and regulatory initiatives in consolidating this positive development. The “Internet+” and China 2025 strategies; action plans for the promotion of big data, smart manufacturing, e-commerce, and AI; and regulatory steps such as the Cybersecurity Law, which came into effect in June 2017, and other industry-specific regulations all help create a positive environment and modern oversight system that itself makes use of new technological capabilities. Although Du cautions against overregulation, he is confident that China is well equipped to become a “major cyber power” (网络强国 wangluo qiangguo). By this he means that China’s exceptional military and economic strength lend it the ability to exert its influence globally in the digital sphere. Establishing China as global power in cyberspace has emerged as a key national policy in recent years, especially since the creation of the Cyberspace Administration of China in 2014 (国家互联网信息办公室 guojia huliangwang xinxi bangongshi), headed by Xi Jinping, which now oversees the development of China’s internet- and information-based technologies and businesses. In 2017 the Chinese government proclaimed its aim to reach global power status in cyberspace by 2035 by harnessing new technologies to boost China’s economic growth and global influence, enabling the country to shape international governance of cyberspace in accordance with its interests.

Guiding public discourse in the digital sphere

Liu Pengfei – deputy secretary of the Public Opinion Monitoring Office of the *People’s Daily* and researcher at the new media think-tank the People’s Net – and research assistant Qu Xiaocheng discuss how the partial replacement of traditional media by new media, particularly through growing use of social media, has revolutionised the transmission of information and opened up new realms for debate.⁵ Online public opinion is becoming more representative as both elderly and young citizens flock online. Although political events, public policy, and China’s national interests have remained hot topics of discussion in recent years, the growth of the middle class means the focus is shifting to issues of livelihood and safety, such as housing prices, food and medicine safety, and education. Cases of legal and social injustice can also draw immediate and widespread attention. Liu and Qu observe that this puts enormous pressure on social governance: even if they acted in line with laws and regulations, government organs have to answer to morally and emotionally charged debates and initiatives, because ignoring public opinion might place them in a weak spot and result in online and offline activism. ⁶ Government and party organisations are rapidly expanding

5 Liu Pengfei (刘鹏飞) and Qu Xiaocheng (曲晓程), “Report on the Development of Public Opinion in China’s Internet 2017” (2017年中国互联网舆论场发展报告), *Blue Book on New Media 2018* (2018年新媒体蓝皮书), 2018, pp. 52-68.

6 The authors give a number of examples, including the debates surrounding “I’m Fan Yusu” and “Frost Boy”. See: Manya Koetse, “‘I Am Fan Yusu’ – Beijing Migrant Worker’s Writing Takes Chinese Internet by Storm”, *What’s On Weibo*, 26 April 2017, available at <https://www.whatsonweibo.com/fan-yusu-beijing-migrant-workers-writing-takes-wechat-storm/>; Javier C Hernandez, “‘Frost Boy’ in China Warms Up the Internet, and Stirs Poverty Debate”, *New York Times*, 13 January 2018, available at <https://www.nytimes.com/2018/01/13/world/asia/frozen-boy-china-poverty.html>.

their online presence in new media in order to reach citizens, promote new policies, and address concerns and other issues. According to Liu and Qu, these efforts have had measurable effects in fostering positive energy (正能量 zhengnengliang) in public discourse, which is a key aim of media policy under Xi. But new challenges have arisen in monitoring and guiding public opinion. The discourse is increasingly fragmented in decentralised social media groups, while the frequency and speed of interaction is rising between groups and across regional and even national boundaries. This creates new virtual communities from which information can spread. Faced with these complex developments, Liu and Qu believe that it is important to improve predictive analysis as well as expand legislation on, and supervision of, new technologies, for which the government has already put in place a slew of regulations since early 2017.⁷

Liu Ruisheng, researcher at the CASS Institute of Journalism and Communication, and research assistant Sun Ping, laud the positive effects of social media, but they also highlight their potential as a hotbed for harmful and illegal information.⁸ With the world's largest number of social media users, China has become concerned about optimising content-focused management to safeguard its rise to a leading cyber power. Despite their advocacy of freedom of expression and information, Western states and enterprises have long had both transparent filtering mechanisms, such as official regulation and codes of conduct which the public are aware of, and non-transparent content filtering based on internal rules and standards; the authors believe China can draw on both to improve its own capabilities.

China currently focuses on striking hard against politically aggressive and terrorist information, but it does not pay enough attention to rumours, fake news, pornography, spam, illegal advertisements, or the infringement of personal rights online, say Liu and Sun. In comparison, Western nations have established more comprehensive mechanisms and built on cooperation between government organs, businesses, and the public that also make full use of filtering technology. China, too, should move towards more nuanced but wider filtering to build a communication ecosystem that better meets the needs of citizens, the authors argue. Progress is already under way, with new regulations issued that formulate new standards and place greater responsibility on service providers.⁹ Under the new Cybersecurity Law there has already been increased legal action against service providers. In addition, China should promote public knowledge of international content filtering practices to raise understanding and public support for domestic

measures, Liu and Sun conclude. Noticeably absent from the work of Liu and Qu, as well as from Liu and Sun, is any discussion of citizens' rights of expression and the ongoing public debate and criticism of content filtering in the West.

Strengthening China's soft power in cyberspace

In today's world, soft power is just as important as hard power, stress Xiang Debao, associate professor at the School of Journalism and Communication, and Zhang Wenzheng, engineer at the Center for Information Technology of the Shanghai International Studies University.¹⁰ Think-tanks play a crucial role in the transmission of concepts and viewpoints and global agenda setting, they say. The authors claim that there is a tightly connected community of global think-tanks, whose strengths in social networks directly correlate with their actual influence on public opinion and policymakers. The success of these outfits is built on their independent agenda-setting, authoritative assessments of current global and public interest issues, and effective online dissemination of this expert knowledge in clear and concise language, often accompanied by visual aids.

Most of the core think-tanks come from developed countries, especially from the US, which results in Western dominance of the global discourse. In Xiang's and Zhang's view, China needs high-end think-tanks to better communicate its viewpoints and secure its place as an opinion leader. But despite a 2015 plan by the State Council for their promotion, Chinese think-tanks are generally still poor at publicising their content.¹¹ In order to increase think-tanks' global influence, the authors recommend that they should: recruit more expertise; enhance their abilities in innovation and independent agenda-setting; improve their use of social media; and strengthen links with global think tanks. This would enable them to establish a Chinese narrative, set new standards in international discourse, and better reflect China's stake in international affairs.

As is evident from the selected sources, the digital revolution and the opportunities it presents are closely connected with the political agenda and academic discourse on China's rise as a global power. Even if challenges remain, China is determined to ride this wave of technological transformation to finally claim the leadership position it missed out on in the previous two industrial revolutions.

⁷ "China Cybersecurity Law One Year On, Eversheds Sutherland", available at <https://www.eversheds-sutherland.com/global/en/where/asia/china/services/cybersecurity-timeline.page>.

⁸ Liu Ruisheng (刘瑞生) and Sun Ping (孙萍), "Inspiration of the Content Filtering Mechanism of Overseas Social Media for China's Internet Management" (海外社交媒体的内容过滤机制对我国互联网管理的启示), *World Socialist Studies* (世界社会主义研究), June 2018, available at <http://www.cwzg.cn/politics/201805/42635.html>.

⁹ Meng Jing and Celia Chan, "China fines Tencent, Baidu and Weibo over banned contents in ongoing crackdown", *South China Morning Post*, 26 September 2017, available at <https://www.scmp.com/tech/china-tech/article/2112921/china-fines-tencent-baidu-and-weibo-over-banned-contents-ongoing>.

¹⁰ Xiang Debao (相德宝) and Zhang Wenzheng (张文正), "Analysis of the influence of global think tanks in social networks in the era of new media" (新媒体时代 全球智库社交网络影响力探析), *Global Review* (国际展望), volume 1, 2018, pp. 129-146.

¹¹ See: "Opinions on Strengthening the Construction of a New Type of Think Tank with Chinese Characteristics" (关于加强中国特色新型智库建设的意见 guanyu jiaqiang zhongguo tese xinxing zhiku jianshe de yijian), *Xinhua*, 21 January 2015, available at http://www.xinhuanet.com/zgjx/2015-01/21/c_133934292.htm.

China: competitor in the global technological race

Marcin Przychodniak

China's economy may well become the world's largest in the next few years, but it is facing serious challenges too. One of the most pressing is how to diversify its sources of growth; central to this is the question of how to raise internal consumption, which is a goal the Communist Party of China (CPC) has set. Modern Chinese consumers expect the economy to move up the value chain, with Chinese products becoming more sophisticated. In 2015 the government published its Made in China 2025 programme, which put digitalisation and technological revolution at the heart of the shift it seeks to make. Made in China 2025 set out the first programme for economic modernisation based on internet technology and digital knowhow. Under the current five-year plan the government and state-owned enterprises are implementing a dozen artificial intelligence and robotics projects, among other technology projects. The implementation of the programme is an important part of academic and official discourse among Chinese researchers. This discourse also focuses on China's general attitude towards the ongoing technological revolution. Xi Jinping further underlined the importance of technology during the 19th party congress in October 2017, which confirmed its significance in Chinese domestic and foreign policy. He linked innovation to development, citing it as a foundation for modernised economy.

A "new round of technological revolution" (新一轮技术革命, *xin yi lun jishu geming*) will provide China with new opportunities, according to Feng Fei, former director-general of the Research Department of Industrial Economy in the Development Research Center of the State Council.¹ He deploys a term coined by Jeremy Rifkin: the "Third Industrial Revolution". Feng argues that three of the most important sectors in the Chinese economy are involved in the changes: bio-economy, the internet industry, and the low-carbon economy. He explains that the "new round" contains three main elements. Firstly, there is a group of emerging technologies in strong need of synergy between industries. Secondly – and in contrast to previous technological revolutions – emerging industries are actively in receipt of support from their host state (including the United States, Japan, and the European Union). Thirdly, all actors (which Feng mainly associates with states) have to cope with the same challenges, which are mainly to do with resource availability, energy consumption, the environment, and climate change.

This third factor makes the competition between the actors inevitable, reduces the possibility of alliances and

cooperation, and increases the probability of conflict. Feng admits that China has reached a stage in its development that enables it to take an active part in the new round of technological revolution. But he also admits that for the moment this brings more challenges than opportunities, and that these challenges will be hard to overcome, for a variety of reasons. Firstly, the technological revolution is broadly connected to the growth in digital means in manufacturing, which is an alternative to human labour (which itself was formerly the basis of China's economic growth). Secondly, changes in the production process mean that the capacity to make rapid adjustments are at the core of an enterprise's competitiveness and also that market forces are now far more important in competition. The current structure of the economy and decision-making processes make this factor especially hard to overcome: the Chinese economy is top-down in nature, with the main CPC bodies making strategic decisions made which the private sector is then meant to implement. This can make it difficult to respond to market challenges. Thirdly, Feng says that China's advantage as a globally competitive big country, thanks to its population and territory, is also decreasing as scale is not as important as it once was. Fourthly, decision-making in the global economy is becoming more decentralised, individualised, and rapid. How can China adapt to the new situation? Feng suggests stimulus in order to attract talent and human capital from all over the world, as well as structural changes related to institutional and procedural mechanisms in the Chinese economy. He points to the 12th Five Year National Strategic Emerging Industry Development Plan from 2012, which in his opinion offers a special focus on emerging industries and could, following its implementation, significantly enhance China's innovation capability.

The current and future impact of the technological revolution (新科技革命 *xin keji geming*) on international relations forms the focus of the work of Feng Zhaokui, honorary academician of the Chinese Academy of Social Sciences, where he was formerly at the Institute of Asia-Pacific Studies. He looks in particular at China-US relations, arguing from the perspective of the so-called "Thucydides trap" (a leading power versus a rising power).² Feng views international competition within the context of the technological revolution through the prism of the historical memory; this is particularly pertinent given the government's express aim to rejuvenate the Chinese nation. His article attempts to capture the elements that may be decisive for China's strength and power. These are: research and development expenditure and its share of GDP; technical trade surplus; the number of patents, research papers and citations; the number of Nobel Prize-winners; and the number of innovative companies. China is leading on some measures but still dealing with several challenges, Feng believes. He argues for China to

¹ 科学网 新一轮技术革命对中国挑战大于机遇, 18 January 2018 ("Science network. A new round of technological revolution brings more challenges for China than opportunities; interview of Economic Information Daily with Feng Fei", <http://www.casac.cas.cn>, 18 January 2018).

² 冯 昭奎, 论新科技革命对国际竞争关系的影响 Feng Zhaokui, "On the new technological revolution and its impact on competition within international relations", 世界经济与政治 *World Economics and Politics*, 2017 No.2.

acquire talent from abroad, explaining that the domestic market is unable to provide specialists in sufficient numbers because education levels are not high enough yet. Feng further looks into the possible connection between future wars and current China-US competition in the technological revolution. He emphasises the importance of military-civilian exchanges of technologies, as well as the expanding use of space, the deep sea, and the Arctic in future conflicts. Feng also sees possible changes on the battlefield as robot soldiers and unmanned aerial vehicles come on stream.

But what should China's policy be in these times of technological revolution? Huang Qixian, an associate professor at the School of International and Public Affairs at Shanghai Jiaotong University, explains China's current digital strategy.³ Huang argues that this state-driven policy is a successful one, prioritising as it does government procurement, funding, and subsidies, while involving large enterprises. He also believes the origins of global technological changes stem from the Thucydides trap and rivalry between states, arguing that the "transfer of power between China and the United States as a challenger and leader in contemporary world politics is likely to promote a new round of major technology change in the world." Major technological changes are already reshaping the current international order and affect the balance between defence and offence. In Huang's view, the state's guidance on technological progress together with the influence it can exert through government procurement and funding is crucial. To keep up with change, states are obliged to increase funding for science and technology, with a special emphasis on military development.

All these authors strongly believe that China has the ability to successfully engage in the new round of technological revolution. Their arguments differ little from the special emphasis on the digital economy that emerges in the general public discussion about China's economic transformation: follow the practical policy outlines set out by the CPC and Xi himself, then fill them in with a substantial theoretical base for the leadership's current policy priorities.

The experts' opinions also fit the trend prevalent within Chinese public debate on how technological and structural changes in the global economy form part of the competition between "rising China" and other countries (mainly the US). In this narrative the success of Made in China 2025 is crucial for restructuring China's economy and is also deeply linked to the current US-China trade dispute. Such competition earns comparisons with the arms race during the cold war. These experts hold that the new round of technological revolution is an extraordinary chance for China to regain its international position after years of "humiliation" (echoing the leadership's narrative) and

to fulfil Xi's two centennial goals: the achievement of a well-off society by 2021 and becoming a developed state by 2049. They believe this is a competition that will restructure the international environment for many years to come, and that China should actively take part in this process and finally regain the position in the world it deserves.

³ 黄琪轩, 大国权力竞争如何引发了技术革命, 19 June 2018, Huang Qixuan, "How competition between big powers trigger the technological revolution", *The Paper*, 19 June 2018 – hereafter Huang, "How competition between big powers trigger the technological revolution".

Credit: The god of China's big data era

Adam Knight

The social credit system (社会信用体系 shehui xinyong tixi) is a loose collective of decentralised attempts to ascribe a credit rating to every individual, company, and government body in China. It is unified by a common ideology and a centralised attempt to nudge certain behaviours through a system of reward and punishment. If implemented fully, the social credit system will become the world's largest social experiment, applying theories of behavioural science to a population of 1.4 billion people. Yet despite initial international media coverage, little is known about how the social credit system operates in its current form.

An Orwellian characterisation of social credit is the favoured narrative of English-language media and academia. Countless media headlines compare the system with *Nineteen Eighty-Four* or other more contemporary cultural references such as the Netflix series *Black Mirror*. The underlying depiction of social credit in these instances is of 'big data meets big brother': a corporatist state spying on its population, hoarding vast swathes of personal data to be algorithmically synthesised into a single three-digit score that dictates one's place in society.¹

These analyses fail to capture the vibrant and diverse debate on the subject of social credit in China itself. Many Chinese observers and policymakers see credit scoring as a cure-all solution to a whole host of societal ills.² For some, the system has been raised to a near-mythological status. Luo Peixin, deputy director of Shanghai's Legislative Affairs Office, has gone so far as to label credit as the god (老天爷 lao tian ye) of the big data era, a guiding hand in a time where society and policymaking is overwhelmed with cascades of data.³

Beyond such celestial comparisons, Chinese scholars have worked to dispel the notion of Chinese exceptionalism when it comes to social credit. For example, Hu Naihong, deputy director of the Credit Research Centre at the Shanghai University of Finance and Economics, situates social credit within the historical context of credit

ratings as a form of economic organisation.⁴ Hu points to the emergence of formal credit-giving organisations in 19th century Britain which met individuals' need for institutions of trust so that strangers could transact with one another. For Hu, more recent history has validated the need for a comprehensive approach to credit-giving. She believes that the 2008 financial crisis marked a turning point that underscored the importance of data collection and data-sharing across society and government in order to better analyse and pre-empt risk. She goes on to argue that this need has intensified in recent years as private companies, now with access to new internet technologies, have offered greater access to finance outside of the formal regulated state apparatus, such as in peer-to-peer (P2P) lending. Such concerns are not unfounded. Several scandals have rocked China's nascent P2P lending industry in recent years, including the dramatic collapse of several high-profile platforms bringing down billions in renminbi of customer investments.⁵

Hu's evaluation of social credit as an economic tool comparable to credit rating systems elsewhere in the world does not stand apart from other scholars' work. In fact, it expands on a large body of Chinese literature on the subject from the early 2000s, spearheaded by Lin Junyue, founder of the social credit system theory and currently chief technical adviser at Zhongda Xinaneng Credit Management.⁶ However, some observers emphasise the ways in which China's social credit goes beyond pure economics, and they identify two key ways in which this happens. Firstly, Liao Yongan and Tan Man, respectively vice-chancellor and dean of the School of Management, Xiangtan University, explore social credit as a solution to the problems that the Chinese court system finds in enforcing judicial decisions; they and many others describe these problems by using the phrase "difficult implementation" (执行难 zhixing nan).⁷ In this sense, social credit adds another form of punishment that extends across society and life. And, in this longer view, social credit is just the latest in a series of initiatives to improve the efficacy of court rulings in the wake of the Fourth Plenum of the 18th party congress in 2014 and its focus on the 'rule of law' (法治 fazhi).

The second difference between social credit and financial credit systems in other countries is the primacy of *chengxin* (诚信) – which translates loosely as "honesty", "integrity", or "trustworthiness" – as one of the scheme's core goals.

1 Rachel Botsman, "Big data meets Big Brother as China moves to rate its citizens", *Wired*, 21 October 2017, available at <http://www.wired.co.uk/article/chinese-government-social-credit-score-privacy-invasion>; Mara Hvistendahl, "Inside China's Vast New Experiment in Social Ranking", *Wired*, 14 December 2017, available at <https://www.wired.com/story/age-of-social-credit/>.

2 Zhan Zheng (Peking University China Credit Research Centre Director), "Building Societal, Commercial, Governmental and Judicial Integrity in City Credit will Bring About Great Change to Citizens' Lives" (通过社会诚信、商务诚信、政务诚信以及司法公信等城市信用领域建设, 带给市民生活、企业成长、城市发展诸多改变, Credit China, 9 August 2018, available at http://www.creditchina.gov.cn/xiaoyuanchengxin/chengxinjiaoyuxunhui/chengxinjiansheteshuodong/201808/t20180809_122995.html).

3 Luo Peixin, (2017) "社会信用与依法治国", "Social Credit and Ruling the Country in Accordance with the Law", International Symposium on Rule of Law & Credit System, Shanghai Jiaotong University, 26 September 2017. On file with author.

4 Hu Naihong, "加强信用体系建设" "Strengthening the Construction of a Credit System", *Guangming Daily*, 12 June 2018, available at http://ifb.cass.cn/wzxd/201806/t20180612_4362049.shtml.

5 Zhou Yanyan, "借贷宝回应不雅照泄露事件: 极少数用户与第三方私下交易产生" "Jiedaibao Responds to Obscene Image Leaking Incident: Small number of users affected by improper third-party behaviour", *The Paper*, 1 December 2016, available at https://www.thepaper.cn/newsDetail_forward_1571689; Hu Weitong, "e租宝案惨淡落幕: 涉案762亿, 投资100元最多拿回25元" "Gloomy End to the Ezubao Saga: Of the 76.2 Billion RMB involved, only 25 Yuan for every 100 Yuan will be returned", *Caijing*, 28 May 2018, available at <http://finance.caijing.com.cn/20180528/4459893.shtml>.

6 Lin Junyue, "社会信用体系原理" "Principles of a Social Credit System", China Fangzheng Press, 2003.

7 Liao Yongan and Tan Man, "以信用立法推进社会信用体系建设" "Furthering the Construction of the Social Credit System through Credit Legislation", *Guangming Daily*, 19 February 2018, available at http://fund.csn.cn/skjj/skjj_jjwv/201802/t20180219_3852710.shtml.

One of the 12 socialist core values, *chengxin* has received additional attention in recent years, with Xi Jinping calling for a greater emphasis on its promotion at the 19th party congress. Many Chinese commentators seek to draw a distinct linear path between the virtue-based governance of the traditional Chinese state (以德治国 *yi de zhiguo*) and the *chengxin* culture re-emphasised by today's Communist Party of China. Hu herself describes social credit as a formalisation of Chinese customs on trustworthiness into regulation.⁸ In her mind, it is this binding of law and morality through the codification of *chengxin* that makes the Chinese social credit system unique.

Beyond such macro-level contextual and conceptual interpretations, the implementation of social credit has taken place in a largely decentralised way, through hundreds if not thousands of individual laws and rulings. Making sense of the mechanics of social credit is no mean feat, but Chen Hongwan has devoted considerable thought to the question. Chen is a senior official at the National Development and Reform Commission (NDRC), the government body formally responsible for the rollout of social credit by 2020. In an interview with the *People's Daily*, Chen identifies three key pillars of social credit regulation.⁹ The first is the creation of a unified credit score – a social credit identity card – for all natural and legal persons in China. Launched by the NDRC in June 2015, this 18-digit code allows different government departments to append new information to a business or individual's social credit record in a standardised manner.¹⁰ The second comprises the launch and expansion of the 'National Platform for the Sharing of Credit Information' in October 2015. Its goal is to break up "isolated islands" (孤岛 *gudao*) of information held by individual ministries and connect all social credit-related data in one central repository. Since its launch, the platform has collated some 16.5 billion data points from 44 different departments and ministries, as well as 31 provincial bodies.¹¹ Chen's final pillar is the establishment of a joint system of incentives to encourage compliance across the scheme, with the aim of ensuring "loss of credit in one area goes punished across all areas" (一处失信, 处处受限 *yi chu shixin, chu chu shou xian*). In practice, this has seen the creation of dozens of industry, ministerial, and provincial 'blacklists' (黑名单 *hei mingdan*) across the country. One jurisdiction will share the details of individuals or companies blacklisted in one area with other jurisdictions, resulting in punishment

8 Hu Naihong, "加强信用体系建设" "Strengthening the Construction of a Credit System", *Guangming Daily*, 12 June 2018, available at http://ifb.cass.cn/vzxd/201806/120180612_4362049.shtml.

9 Li Haiyun, "观察社会信用体系:信用社会来临,你准备好了吗" "Observing the Social Credit System: The Credit Society is coming, are you ready?", *People's Daily*, 4 June 2018, available at http://www.xinhuanet.com/fortune/2018-06/04/c_1122931164.htm (hereafter, *Observing the Social Credit System: The Credit Society is coming, are you ready?*).

10 "关于转批发展改革委等部门法人和其他组织统一社会信用代码制度建设总体方案的通知" "Notice on a General Plan for the National Development and Reform Commission and other Departments to Construct a System of Unified Social Credit Numbers for Legal Persons and other Organisations", State Council, 2015, available at http://www.gov.cn/zhengce/content/2015-06/17/content_9858.htm.

11 *Observing the Social Credit System: The Credit Society is coming, are you ready?*.

across the board. Travel bans are the most immediate and well-reported examples of the effects of such blacklisting. By April this year, close to 11 million individuals had been blocked from buying plane tickets on account of their blacklisting somewhere within the social credit system.

With so much at stake with the full rollout of social credit, there has been significant and intense commentary on the system's current implementation, as well as speculation on where it should go from here. Various research centres and think-tanks produce regular reports on the progress of social credit, the two most influential being Wu Jingmei's yearly 'Outlook' report, published in the journal *Credit Reference*, and Peking University's annual review and forecast for the system over the next 12 months.¹²

However, perhaps few individuals in China are better placed to comment on the future priorities for social credit than Zhang Yong. As deputy director of the NDRC, he sits at the heart of the central government's efforts to bring the system to fruition. At a press conference held at the 13th national congress in March 2018, Zhang suggested four areas of improvement key to social credit's success.¹³ The first is to prioritise further legislative work on the system. Many aspects of social credit currently exist only in the form of "guiding opinions" (指导意见 *zhidao yijian*) rather than as fully fledged and ratified laws. Secondly, Zhang argues that data-sharing across all levels of government needs to improve, not only in terms of quantity but also quality. Thirdly, the system of joint rewards and punishments meted out through "redlists" and blacklists requires expansion so as to achieve proper cross-jurisdictional incentives for 'good' or 'bad' behaviour. Interestingly, Zhang also calls for specific improvement of the way in which an individual's credit record and, by extension, their membership of a blacklist is updated. In recent months, the media have featured numerous reports of individuals who have not had their credit record updated due to time delays or geographic distance and thus find themselves at the continued peril of blacklisting despite having paid their dues. Zhang cites such negative coverage as a potential stumbling block for the adoption of social credit nationwide. Finally, maintaining his emphasis on public perceptions of the system, Zhang advocates a more optimistic message through the promotion of *chengxin* culture. Framing and implementing social credit in this more positive way has already started to take root at the local level, with dozens of cities launching schemes to emphasise the carrot over the stick in the form of subsidised utilities and free access to public transport.

12 Wu Jingmei, "2018年展望: 征信面临突破" "Outlook for 2018: Credit Industry Faces Breakthroughs", *Credit Reference*, 2018(1); "(2018) 2017中国社会信用体系建设的回顾与2018年展望" "2017 Review of Chinese Social Credit System Construction and Forecasts for 2018", Peking University China Credit Research Centre On file with author. A summary of the report's findings can be found at https://www.creditchina.gov.cn/xiaoyuanchengxin/chengxinjiaoyuxunhui/chengxinjiansheteshuodong/201805/t20180530_116867.html?randid=0.7735649642064721&sign=ABZocnNfd2NtX3ByZXXZpZXkdYWNjZXNzAAA4gAAAAQAAAAcAAAAcAAAAAB8AAAAc.

13 "张勇: 社会信用体系建设下一步主要在四个方面着力" "Zhang Yong: Four Important Areas to Strive Four in the Construction of a Social Credit System", *Xinhua*, 6 March 2018, available at http://www.xinhuanet.com/politics/2018lh/2018-03/06/c_129823589.htm.

Furthering many of Zhang's points, Liao and Tan summarise the challenge of the coming years for social credit as one that requires significant centralised coordination above all else.¹⁴ They call for the establishment of a national Credit Management Office to direct data-sharing efforts, as well as greater legislation to encourage a market for private credit services. Like many other Chinese observers of social credit, Liao and Tan remain bullish. They do, however, also raise the question of personal privacy, warning that the system's success relies on its ability to balance functionality and data protection.

Liao and Tan consider this just one of many contradictions that make social credit such a uniquely complex topic. As a policy priority, they argue, social credit must offset both public and private rights to information, sitting at the intersection between law and morality. As a holistic system, it requires both top-level planning and bottom-up cooperation. Its success rides on its assimilation with local conditions, while also maintaining a broader outlook. The debate around social credit's future direction is likely only to intensify in the coming months and years as it reaches into ever deeper corners of Chinese society.

Enthusiasm and challenges in China's embrace of AI

Elsa B Kania

In China, enthusiasm for innovation in artificial intelligence starts at the highest levels.¹ In his remarks to the 19th party congress, Xi Jinping called for China to “promote the deep integration of the internet, big data, and AI with the real economy.”² His 2018 new year's address saw two books on AI positioned on the bookshelf behind him, another indication of the extent of his interest.³ China's leaders evidently recognise the advent of AI as a strategic opportunity for China to achieve first-mover advantage by forging ahead in the development of potentially revolutionary technologies. The New/Next Generation AI Development Plan (新一代人工智能发展规划 *xin yidai rengong zhineng fazhan guihua*), released in July 2017, captured headlines by boldly declaring China's ambition to “lead the world” and to emerge as the “world's premier centre of innovation” in AI by 2030.⁴ China's ‘rise’ in AI – and potential emergence as an “AI superpower” – continues to command headlines, while the remarks of China's policy and business leaders indicate a keen awareness of continued challenges and shortcomings.⁵

China's innovation imperative

Xi launched a national strategy for “innovation-driven” (创新驱动发展 *chuangxin qudong fazhan*) development in 2016, recognising innovation as an essential engine for future economic dynamism and military capabilities.⁶ This innovation imperative is at the core of his strategy to advance the “China Dream” (中国梦 *zhongguo meng*) of national rejuvenation. China's leaders believe that their country's historical technological backwardness resulted in weakness and vulnerability to foreign powers. This reinforces their belief in the importance of science and technology in enhancing China's power today. Under Xi, China aims to emerge at the forefront of innovation by 2030 and as a global powerhouse, even superpower, in innovation by the middle of the century.⁷ China may indeed

¹ “How Can AI Empower a New Age? Xi Jinping Speaks Thusly” [人工智能如何赋能新时代? 习近平这样说], 81.cn, 18 September 2018, available at http://www.81.cn/jwgz/2018-09/18/content_9289494.htm.

² “Xi Jinping's Report at the Chinese Communist Party 19th National Congress” [习近平在中国共产党第十九次全国代表大会上的报告], *Xinhua*, 27 October 2017, available at http://www.china.com.cn/19da/2017-10/27/content_41805113_3.htm.

³ “The Two AI Books on Xi Jinping's Bookshelf” [习总书记架上两本人工智能书], Tencent, available at <https://cloud.tencent.com/developer/article/1067180>.

⁴ “State Council Notice on the Issuance of the New Generation AI Development Plan” [国务院关于印发新一代人工智能发展规划的通知], State Council, 20 July 2017, available at http://www.gov.cn/zhengce/content/2017-07/20/content_5211996.htm.

⁵ See: Kai-Fu Lee, *AI Superpowers: China, Silicon Valley, and the New World Order*, Houghton Mifflin Harcourt, 2018.

⁶ “CPC State Council Releases the “National Innovation-Driven Development Strategy Guidelines” [中共中央 国务院印发《国家创新驱动发展战略纲要》], *Xinhua*, 19 May 2016, available at http://news.xinhuanet.com/politics/2016-05/19/c_1118898033.htm, (hereafter, “CPC State Council Releases the “National Innovation-Driven Development Strategy Guidelines”).

⁷ “CPC State Council Releases the “National Innovation-Driven Development Strategy Guidelines”.

¹⁴ Liao Yongan and Tan Man, “以信用立法推进社会信用体系建设” “Furthering the Construction of the Social Credit System through Credit Legislation”, *Guangming Daily*, 19 February 2018, available at http://fund.cssn.cn/skjj/skjj_jjyw/201802/t20180219_3852710.shtml.

have a unique opportunity in AI to lead a new technological revolution, particularly through education and enabling infrastructure.

As its plans and policies imply, the Chinese government recognises AI as a unique opportunity to enable the transformation of China's economy at this "decisive" stage. "China's New Generation AI Development Plan describes the cultivation and expansion of AI industries as a way to "inject new kinetic energy" into China's economic development, increasing productivity and national competitiveness. A slowdown in growth could pose even an existential challenge to the legitimacy of the Communist Party of China. The emphasis on AI therefore reflects these concerns and the recognition of the utility of AI in contributing to social construction and governance. In certain respects, the level of enthusiasm for AI in enhancing education and healthcare reflects an almost techno-utopian perspective on the potential positive transformation that AI can bring about. Yet this is paired with an emphasis on the use of AI to enhance social control and stability. China convened the first World Artificial Intelligence Conference in Shanghai in September 2018, showcasing the achievements of some of its leading companies. Xi lauded the conference's theme of a "new era empowered by AI" (人工智能赋能新时代 *rengong zhineng funeng xin shidai*) and called for the promotion of AI "for the benefit of mankind."⁸

Challenges and opportunities

The general excitement about AI in China is tempered by an awareness of the continued challenges and persistent shortcomings in certain core technologies. Chinese technology and policy leaders often discuss these quite candidly, including acknowledging gaps in talent and advanced research in central and local plans and policies. While it is difficult even to identify the right metrics to track China's trajectory in AI, there is a general consensus that China is still striving to catch up with the United States. For instance, in April 2018 the Chinese People's Political Consultative Conference convened a consultation symposium to facilitate government engagement with relevant leaders in academia and industry. There, discussions centred on concerns about the gap between the level of AI development in China relative to that of major developed countries – namely, the US. It focused particularly on the need to achieve major original results and put in place the relevant supporting infrastructure.⁹ Chinese technology leaders have been broadly supportive of this policy agenda, and may have influenced the

⁸ "State Council Notice on the Issuance of the New Generation AI Development Plan" [国务院关于印发新一代人工智能发展规划的通知], State Council, 20 July 2017, available at http://www.gov.cn/zhengce/content/2017-07/20/content_5211996.htm.

⁹ "Letter from Xi Jinping to the 2018 World Artificial Intelligence Conference" [习近平致2018世界人工智能大会的贺信], *The Paper*, 17 September 2018, available at https://m.thepaper.cn/newsDetail_forward_2448320.

¹⁰ "National CPPCC's "Artificial Intelligence Development and Countermeasures" Bi-weekly Consultation Symposium" [全国政协 "人工智能的发展与对策" 双周协商座谈会], People's Political Consultative Conference, 24 April 2018, available at <http://www.cppcc.gov.cn/zxww/2018/04/24/ART11524530864901945.shtml> (hereafter, "National CPPCC's "Artificial Intelligence Development and Countermeasures" Bi-weekly Consultation Symposium").

government's own direction through such mechanisms. For instance, the calls of Chinese technology leaders, notably Baidu's CEO Li Yanhong, in 2015 for a plan focusing on AI development were not dissimilar from the plan that the Chinese government later developed. Chinese technology leaders and experts also helped formulate the plan.¹¹

While the notion that its approach to AI development is primarily state-driven remains a common misconception among Westerners, China is, in fact, undertaking a more market-oriented approach to advancing AI, while also providing strong state support. Li Yanhong has previously argued that China has a potential policy advantage in AI thanks to the government's ability to mobilise resources and infrastructure to accelerate its development.¹² For instance, the central government and a growing number of local authorities are now concentrating on providing open and open-source platforms for innovation. They focus on making software, hardware, and computing resources widely available to enable mass innovation and entrepreneurship. Since it views the disparity between ever stronger demand and still-limited supply of talent in AI as a serious shortcoming, the Chinese government is actively seeking to create incentives to attract top AI experts from around the world. Meanwhile, it is also rapidly expanding educational opportunities, from training programmes that leverage partnerships between academia and industry to the establishment of AI as a first-level discipline in higher education.

Although there remains a gap between China and the US in AI, Chinese leaders have argued that China has an opportunity not only to catch up but also overtake the US. For China, the concept of "taking a turn sharply to surpass" (弯道超车 *wandao chaoche*) – implicitly, the US – is a core priority for those participants who argued during the April 2018 consultation symposium that China should "dare to lead" in innovation at the "global frontier" of this emerging technology.¹³ Chinese policymakers have also argued that China should lead by leveraging China's market dominance to set and shape standards, thus influencing the development of standards around the world. Such calls for a new leapfrogging in Chinese development indicate support for China using an active approach towards policy and capacity for coordination within its massive market. Doing so will enable it to achieve a first-mover advantage that might enable future dominance in these technologies.

This pursuit of leadership in AI is also closely linked to China's global geopolitical objectives. Others at the symposium argued that China should prioritise the capability for multi-language speech recognition in order

¹¹ See: Delegate Li Yanhong Recommends the Establishment of a 'China Brain' Plan" [李彦宏委员建议设立 "中国大脑" 计划], *People's Daily*, 3 March 2015, available at <http://pic.people.com.cn/n/2015/0303/c1016-26627781.html>.

¹² "National CPPCC's "Artificial Intelligence Development and Countermeasures" Bi-weekly Consultation Symposium".

¹³ "National CPPCC's "Artificial Intelligence Development and Countermeasures" Bi-weekly Consultation Symposium".

to advance its “One Belt, One Road” initiative.¹⁴ The establishment of a data centre with a corpus adequate for the advancement of natural language processing across multiple languages is integral to this area of development. This debate reveals that China’s much-touted data advantage, based on the amount of data generated within its own economy and society, has limitations as Chinese AI looks to go global. For instance, there can be very specific requirements for data in different contexts and applications. Chinese tech companies are contributing to China’s advancement of a “digital silk road” (数字丝绸之路 *shuzi sichou zhilu*) under the aegis of this strategy.¹⁵ This could further reinforce their competitiveness through providing opportunities for new access to data and markets worldwide.

Such an aspiration is accompanied by an acute awareness among Chinese technology leaders and policymakers that China still faces major obstacles to indigenous innovation in core technologies. For example, in response to a violation of sanctions by telecommunications company ZTE, the US introduced a temporary ban to prevent it from buying American technology. The move brought ZTE to the brink of collapse.¹⁶ This was a harsh awakening at a time when enthusiasm about the Made in China 2025 innovation plan was reaching a new peak. It also highlighted how the US might deny China the technology it needs, especially given the backdrop of a new era of confrontation and a potential decoupling in the bilateral relationship. In the aftermath of the incident, Xi highlighted the imperative of self-reliance and indigenous innovation (自主创新 *zizhu chuangxin*) in “core technologies”.¹⁷ Indeed, the ZTE crisis may prove in retrospect to be a pivotal moment as China’s comes to grasp the importance of chips as a core foundation for information technology – and AI. For instance, commentary in the *People’s Daily* has highlighted the perceived humiliation of this ban, while arguing that the dangers of depending on foreign sources for such technologies should catalyse even more extensive investments in the chip industry.¹⁸ This traumatic moment is likely to spur on a redoubling of research and development into the hardware dimension of AI development. This includes the funding of multiple projects aimed at new types of AI chip, which is now starting to pay off in the emergence of a flurry of start-ups.

14 “National CPPCC’s “Artificial Intelligence Development and Countermeasures” Bi-weekly Consultation Symposium”.

15 See: “Standards China Unicom Joint Construction ‘One Belt, One Road’ Action Plan” (标准联通共建“一带一路”行动计划) (2018–2020) released by the Standardisation Administration of China (中国国家标准化管理委员会), *Xinhua*, 22 December 2017, http://www.xinhuanet.com/2017-12/22/c_1122155113.htm.

16 See: Claire Ballentine, “U.S. Lifts Ban That Kept ZTE From Doing Business With American Suppliers”, *New York Times*, 13 July 2018, available at <https://www.nytimes.com/2018/07/13/business/zte-ban-trump.html>.

17 “Xi Jinping: Seize the Opportunity to Confront Difficulties and Construct a Global S&T Superpower” [习近平: 抢占先机迎难而上建设世界科技强国], Chinese Academy of Sciences, 28 May 2018, available at http://www.cas.cn/tt/201805/t20180528_4647453.shtml.

18 “People’s Daily Commentary on ZTE Crisis” [人民日报评中兴危机], *People’s Daily*, 18 April 2018, available at <http://opinion.people.com.cn/n1/2018/0418/c1003-29935319.html>.

Risks and security concerns

China’s quest to advance AI includes looking at these new technologies through a national security and defence lens, following concerns about other militaries’ activities and investments. Unsurprisingly – and not unlike the US and Russian militaries – the Chinese People’s Liberation Army (PLA) has actively pursued and supported AI research and development. The contributions of the Chinese defence industry, along with military research institutes and a limited but growing number of tech companies, are integral to this endeavour. The perspectives of engineers and leadership alike reflect awareness of particular challenges of this sector. For instance, AI developed for commercial applications often cannot be directly applied to military equipment, as Wu Ximing, deputy director of the Aviation Industry Corporation of China’s Science and Technology Committee, has pointed out.¹⁹ China’s national strategy of military-civil fusion (or civil-military integration, 军民融合 *junmin ronghe*) sets AI as a priority. It aims to serve as a framework for efficient exchange and cooperation across sectors to advance the development of the relevant technologies.

China’s defence industry is organising to build capabilities in anticipation of future “intelligentised” (智能化 *zhinenghua*) warfare, in which AI will be integral to military power. As a result, major players in the Chinese defence industry are drafting and promoting a plan to guide the development of AI in aviation and aerospace. This new initiative, which is to guide these sectors over the next 15 years, reflects a candid recognition of current challenges and impediments to progress, which has motivated the Chinese defence industry’s call for greater support from the government. At present, China suffers from several disadvantages in applying AI to aerospace research and development, including bottlenecks in theory and technology and shortfalls in the availability of talented researchers, according to Liu Qiang, a researcher with the China Aerospace Science and Industry Corporation.²⁰ At a basic level, the dispersal of the key data across different units in industry, the military, and even universities has remained an impediment to sharing and development of aerospace applications.

Despite this enthusiasm for military applications of AI, Chinese leaders also recognise the risks that might result from it. A recent China Institute of Information and Communications white paper on AI safety and security (人工智能安全白皮书 *rengong zhineng anquan baipishu*) characterised AI as a “double-edged sword,” observing, “AI can be used to construct a new type of military strike force, directly threatening national security.”²¹ Future intelligent weapon technologies may result in warfare becoming

19 “National CPPCC’s “Artificial Intelligence Development and Countermeasures” Bi-weekly Consultation Symposium”.

20 “National CPPCC’s “Artificial Intelligence Development and Countermeasures” Bi-weekly Consultation Symposium”.

21 “AI Security White Paper” [人工智能安全白皮书], China Institute of Information and Communications, September 2018, available at <http://www.caict.ac.cn/kxyj/qwfb/ bps/201809/P020180918473525332978.pdf>.

“remotely controlled, precise in striking, a miniaturisation of the battlefield, and lead to an intelligentisation of processes.”²² As militaries worldwide start to pursue these capabilities, there are reasons for concern about a new arms race. Chinese defence academics and strategists, including Professor Zhu Qichao of the PLA’s National University of Defense Technology, have also highlighted the risks that may arise from AI in warfare.²³

Against the backdrop of AI’s active development, Chinese policymakers also recognise the safety issues that the technology might present from technical and policy perspectives. There are still a range of technical limitations in AI that create the potential for risky failures. As the deployment of AI expands and becomes more ubiquitous in society, these security risks are likely to increase dynamically, as the white paper highlights. Consequently, some Chinese security experts, such as Wu Shizhong, chief scientist with the China Information Security Evaluation Center, have called for the appropriate management of the relationship between security and development. Such concerns about the risks of AI have motivated the Chinese government’s greater engagement with AI safety/security from a technical perspective.

China’s embrace of AI reflects a growing expectation and assessment by both political and technology leaders that these AI technologies could prove revolutionary. If it is successful in leveraging the full potential of AI to enhance its development, China could emerge as a true global leader in innovation. However, as the viewpoints and perspectives of Chinese thought-leaders and stakeholders reveal, there remain real obstacles and reasons for concern about future challenges. This includes questions around bolstering capabilities in core technologies and confronting new questions of safety and security that will emerge along the way. While China’s future trajectory in AI remains uncertain, active debates and engagement in the policy process reflect the intense attention that this strategic technology is receiving.

²² China Institute of Information and Communications (CAICT), “AI Security White Paper” [人工智能安全白皮书], September 2018, <http://www.caict.ac.cn/kxyj/qwfb/hps/201809/P020180918473525332978.pdf>.

²³ Zhu Qichao [朱启超], “AI Intervenes in Military Affairs or Assaults Humanity’s Ethical Bottom Line” [人工智能介入军事或冲击人类道德底线], *The Paper*, 23 June 2017, available at https://www.thepaper.cn/newsDetail_forward_1700214.

Notes

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