

CHINA'S REGULATIONS ON ALGORITHMS

Context, impact, and comparisons with the EU

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SUMMARY

- **China has advanced a powerful framework for regulating algorithms.**
- **The regulations are likely to have a positive impact upon platform work by enforcing transparency on algorithmic management decisions and incorporating social stakeholders in algorithm design.**
- **The regulations provide important indications of how AI and algorithms can be regulated in the public interest, from which European policymakers can draw important insight to guide their efforts.**

INTRODUCTION

On 1 March 2022, China's *Regulations on the Administration of Internet Information Service Recommendation Algorithms* (hereafter, 'Regulations') entered into effect (Creemers et al., 2022). The new Chinese provisions, consisting of 35 brief articles, constitute a sweeping and comprehensive effort to regulate the use of 'algorithmic recommendation services' across society – addressing spheres ranging from news and social media and e-commerce to fraud prevention and platform work. As such, the regulations cover virtually all forms of recommendation and decision-making algorithms.

Algorithms are automated recommendation-generating and/or decision-making pieces of code. Combined with the exponential increase in available data and powered by new machine-learning (ML) and artificial intelligence (AI) applications, algorithmic recommendation systems are developed to dynamically respond to new data, changing user inputs, newly available content/options and evaluations of previous results in order to make decisions which produce pre-established outcomes (Rana and Jain, 2015).

This short report contextualises the Regulations underlying China's dual imperatives in the area of digital economy policymaking: a long-standing techno-nationalist effort racing toward the technological frontier of digital technologies (Rikap and Lundvall, 2021), while preserving social stability during a period of socio-technical upheaval. Rather than simply challenging 'big tech', then, the Regulations ultimately constitute elements of a broader effort to socially legitimise their implementation while strengthening their effectiveness and core functions.



2025

14th Five-Year Plan

Digital economy to reach 10% of GDP by 2025



2025

48.6 trillion gigabytes

The amount of data China is expected to generate in 2025, when it becomes the world's largest producer.



2030

New Generation AI Development Plan

Develop a US\$1tn AI economy by 2030

The report places the Regulations in the context of recent shifts toward digital regulation within China, examines the broad scope of the Regulations, and explores the impact these may have across society. It looks in particular at the consequences of algorithmic management for work and workers (and particularly for the platform economy), and what impact the Regulations may have on this field. Finally, it contrasts the Regulations with comparable initiatives in the European Union, arguing that China's combination of a stringent regulatory system with expansive industrial policy aimed at pushing toward the technological frontier constitutes a formidable means of socially embedding the digital economy.

Due to scandals surrounding algorithmic manipulation like those involving Cambridge Analytica and 'Facebook whistleblower' Frances Haugan's Congressional testimony, governments are increasingly examining how to regulate AI (Digital Regulation Cooperation Forum, 2022, OECD, 2019). So far, corporate self-regulation has predominated, and various voluntary codes of conduct have attracted government and corporate signatories.¹ At the root of much algorithmic bias and manipulation, however, is the private nature of digital infrastructure and the attempt to extract profit through influencing behaviour (Narayanan, 2019, Petropoulos, 2022). This limits the impact of voluntary regulation.

ALGORITHMIC REGULATION: BACKGROUND

Despite their proliferation, recommendation and decision-making algorithms remain largely invisible (Forlano, 2018). But algorithms shape and determine outcomes across far broader avenues of social life than shopping and social media, including online search result rankings and news media suggestions, access to bank loans, commercial and individual pricing mechanisms, healthcare access and insurance premiums, policing and the criminal justice system, social welfare provision, workplace recruitment and analytics, and platform work – often without the knowledge of users (Burrell and Fourcade, 2021). Across these spheres, algorithmic mechanisms make recommendations and take decisions, optimising dynamically in line with new data and the observed success of past outputs (Rana and Jain, 2015).

Recommendation and decision-making algorithms are not neutral, but contain and systematically reproduce social biases (Kaushal et al., 2020). Biased outcomes can arise from poor quality (or irrelevant) training data, false inferences drawn during processing, the misapplication of otherwise 'sound' algorithms to unsuitable contexts, and poor interpretation of algorithmic outputs (Danks and London, 2017, Baeza-Yates, 2022, Kordzadeh and Ghasemaghahi, 2022). The more widespread such systems become, the greater the likelihood that biases become etched into the social fabric as 'self-fulfilling prophecies' (Rona-Tas, 2020).

Against the predominant trend toward corporate self-governance, China's Regulations stand out as the first significant governmental attempt to legally enforce algorithmic regulation, surpassing any laws and regulations to be found in advanced economies.

CHINA'S INTERNET

China's engagement with the Internet has been guided by its techno-nationalist strategy of development, coupled with the imperative of maintaining social stability. Beginning with attempts to control the Internet during the late 1990s (famously described by then-President Bill Clinton as a futile attempt to 'nail Jello to the wall'), China successfully built a highly regulated cybersphere through DNS-interference, IP-blocking and packet-sniffing to regulate inbound traffic and restrict access to sensitive content (Griffiths, 2021). The 'Great Firewall' facilitated a balance between Internet openness and censorship – censoring content locally and blocking overseas platform rivals (most notably Google and Facebook), while allowing critical transnational communications to continue to flow for companies which openly used VPNs to circumvent controls (Sheehan, 2022).

1. A list of voluntary ethical frameworks is collected here: <https://www.coe.int/en/web/artificial-intelligence/ethical-frameworks> ; see also, e.g.: https://www.academyforlife.va/content/dam/pav/documenti%20pdf/2020/CALL%2028%20febbraio/AI%20Rome%20Call%20x%20firma_DEF_DEF_con%20firma_.pdf

More recently, the Chinese state has placed the digital economy at the core of its economic development strategy (Zhu, 2018).

China's State Council unveiled a plan in 2017 to make China a global leader in AI by 2030, including assuming a leadership role in both commercialising and defining technical and ethical standards (Roberts et al., 2021).

And the current (14th) Five-Year Plan aims to increase the value-added by the digital economy to 10 per cent of GDP by 2025 (Xinhua, 2022). China is home to several of the world's largest digital enterprises, such as Tencent and Alibaba. It is second only to the United States in terms of the value of its investments in digital technology. And the country is set to become the world's largest generator of data by 2025 (Choudhury, 2019).



Chinese Academy of Sciences
is the top publisher of
'high quality' AI research globally

Critical to the unfolding of China's digital success story is the ability to combine its vast troves of data (the raw material of the digital economy) with robust AI-powered algorithms (Roberts et al., 2021).



China produced twice the
STEM PhDs of the United States
in 2020.

Across a wide range of metrics such as human capital, scientific publications, investment, and depth of commercial application, China has become a global AI leader (Lee, 2018). The Chinese Academy of Sciences is the world's no.1 publisher of high-quality AI research, while China produced nearly twice the STEM PhD graduates that the US did in 2020 (mostly in high-quality programmes).

Similarly, it has successfully embedded commercial AI applications in areas like smart cities programmes, education and healthcare, facial recognition technologies, and autonomous vehicles.²

2. See: <https://www.stateof.ai/>

HOW TO REGULATE AN ALGORITHM

It is increasingly clear that a robust regulatory environment is a critical precondition for AI success in order, for instance, to prevent monopolistic firms from restricting broader access to data and innovations, and to exclude those firms selling poor-quality or harmful AI services which may disrupt markets and reduce trust (Ada Lovelace Institute, 2021). China's Regulations for algorithmic recommendation services are the latest in a five-year arc of policymaking aimed at developing, regulating, and redefining operations of power in Chinese cyberspace – beginning with the 2017 Cybersecurity Law (Stacks, 2022).

Regulatory strategy is substantially driven by intense rivalry with the United States for technological supremacy in digital technology and AI (Rolf and Schindler, 2022).

The Regulations³ stipulate not only that service users be explicitly informed of the use of recommendation services and offered an opt-out, but that they also be able both to view keywords used by algorithms to profile individuals and provided the opportunity to remove these tags. Algorithms must be regularly assessed for efficacy, fairness and security. As well as limiting algorithms engaged in search-filtering and personalised recommendations, the Regulations also curtail use of 'content-generating' algorithms, including automated translation, news article-generation, and 'deepfakes' – all of which must be explicitly indicated as algorithmically generated content or face removal. Efforts to maintain social stability are evident in the requirements for algorithms to 'present information conforming to mainstream values', to 'prevent or reduce controversies or disputes', and avoid publishing 'fake news'. They further restrict algorithm developers from producing addictive content for children and order protection of the elderly from fraudulent and other pernicious activities. Along with search-filtering and personalised recommendation algorithms, the Regulations also cover labour-dispatch and control algorithms, and 'content-generating' algorithms (including automated translation, news article-generation, and 'deepfakes'). Finally, the Regulations also seek to regulate labour-dispatch and control algorithms.

The strength of the Regulations is striking. This can be partly explained by the 'fuzzy logic' of China's digital regulations, where strong but imprecise regulations offer the government broad discretion in enforcement (Parasol, 2021). But this is not to understate the significance of the Regulations, which entail an opening up of algorithmic black boxes (the commercially-sensitive 'crown jewels' of Internet companies) to both regulators and the broader public (Hao, 2022). China's Cyberspace Administration (CAC) began publishing the details of commer-

3. See: <https://digichina.stanford.edu/work/translation-internet-information-service-algorithmic-recommendation-management-provisions-effective-march-1-2022/>

cial algorithms in use by internet giants like Tencent and Baidu August of 2022, with 100 algorithms currently catalogued.⁴

The algorithmic Regulations in question are also part of a contemporary ‘regulatory storm’ engulfing the digital economy since October 2020. Beginning with the Chinese government’s suspension of Ant Financial (Alibaba’s fintech spinoff) US IPO, 2021 witnessed the suspension of ride-hailing firm Didi from mobile app stores, the decimation of the edtech sector, and stringent controls placed upon video gaming (Naughton, 2021). The Personal Information Protection Law (PIPL), the counterpart of the European GDPR, entered into effect in November 2021 (Creemers and Webster, 2022). And the Data Security Law was enacted in September 2021, imposing strict localisation measures on citizens’ data (DigiChina, 2022). Altogether, the clampdown destroyed approximately US \$ 1 trillion of digital firms’ market capitalisation (Mathews, 2021).

As Dan Wang (2022) has argued, the party-state has recently come to view the consumer Internet as a largely unproductive and overcapitalised economic sector, which diverts talent and investment from core technologies critical for economic development – all while at the same time threatening social stability. Xi Jinping’s ‘New Development Concept’ aims to drive ‘high-quality growth’ in the real economy by rectifying this situation (Xi, 2021). As he argued in a speech to the CCP’s Politburo in October 2021, ‘unhealthy and irregular signs and trends ... not only affect the healthy development of the digital economy, but also violate laws and regulations and pose a threat to national economic and financial security, which must be resolutely corrected and managed’ (Xi, 2022). Regulation also appears designed to ensure that the growing economic and infrastructural power of digital platforms does not go hand-in-hand (as is the case, arguably, in most countries) with enhanced corporate political power (Rolf, 2021).

Even amidst this policymaking blizzard, China’s new Regulations on algorithms are striking in terms of their scope, strength and ambition.

WORK IN CHINA’S ALGORITHMIC CAPITALISM

The Regulations are likely to have a significant impact on work, both in China’s platform economy and more broadly. 78 million Chinese were working on platforms in 2019, accounting for 9.6 per cent of China’s total labour force – one of the world’s highest proportions (Zhou, 2020). As elsewhere, management-by-algorithm imposes intense discipline upon groups like couriers (*kuai di* and *wai mai*) and cab drivers working on Chinese apps (Lei, 2021). Workers in these sectors are subject to intense and inflexible performance demands by algorithms. They are typically self-employed – and hence ineligible for social security benefits, while possessing few rights with which



2019

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to challenge unfair managerial decisions or dismissals (Chen, 2018).

Beyond the platform economy, workplace surveillance algorithms are rife in China – not only for monitoring productivity and performance by measuring keystrokes, communications, and breaktimes, but also for functions like automatic deductions from bonuses for measured infractions of discipline and the use of ‘wearable’ technologies to monitor downtime, bathroom breaks, and physical and emotional responses to work. In 2021, the extensive use of overtime (termed ‘996’ culture in China’s tech firms, where workers typically work from 9 a.m. – 9 p.m. 6 days a week) was deemed illegal by China’s Supreme People’s Court (Zhang, 2021).

The Regulations appear to pose considerable challenges to the use of algorithmic management technologies. The key item in the algorithm Regulations is article 20, which stipulates that companies using management algorithms ‘protect workers’ lawful rights and interests such as obtaining labour remuneration, recuperation and holiday, etc., and establish and perfect algorithms related to platform sign-on and allocation, composition of remuneration and payment, working time, rewards, etc.’ This appears to be intended to minimise social dislocation due to labour exploitation in the flourishing, but non-strategic, consumer Internet sector. During recent years, services and logistics have come to the forefront as the leading area of labour disputes. Led by cab drivers, food delivery workers and couriers, transport and logistics represented 34 per cent of all strikes in 2021, second only to the construction industry (China Labour Bulletin, 2022).

One recent episode involving the food courier sector presages the potential impact of these stipulations. As Covid-19 turned the world’s attention to the value of key workers, China’s *Renwu* magazine published a lengthy article in September 2020 examining the plight of riders working as independent contractors on platform food delivery firms such as Meituan and Ele.me.⁵ The article, which went viral on social media, explained at length how a gruelling algorithmic management system effectively forced riders to speed, run red lights, violate traffic codes and endanger themselves and others to avoid punitive late or missed delivery deductions. In response to

4. The full list of algorithms is available on the CAC website: http://www.cac.gov.cn/2022-08/12/c_1661927474338504.htm

5. Available in English translation here: <https://chuangcn.org/2020/11/delivery-renwu-translation/>

the ensuing public outcry, China's State Council published a communique in July 2021 enjoining platforms to respect workers' rights and interests, and ensure that algorithms do not jeopardise their remuneration or health and safety (China Government Net, 2022). During the same month, a variety of central regulatory authorities published guidance in tandem with the All-China Federation of Trade Unions (ACFTU, the state-operated trade union federation) mandating unions to play a key role in supporting delivery workers to minimise threats from algorithmic management ([ACFTU], 2022). In response to the communique and the first draft of the Regulations, Meituan published the principles of its delivery scheduling algorithm in a social media post in October of 2021, explaining how it generates four delivery time estimates and selects the longest of the four in order to minimise driver stress. It admitted that issues remain with the algorithm and requested feedback so that it could undertake further improvements (Ma, 2022).

Beyond stipulations directly involving work, the Regulations are likely to have secondary impacts upon workers and working conditions across the economy. For example, Article 15 bars the use of algorithms to 'uphold monopolies or engage in unfair competition'. If enforced, greater interoperability is likely to tilt platform ecosystems in favour of smaller players, by for instance removing bans on SMEs selling goods across multiple e-commerce platforms and by enabling multihoming. This could in turn potentially reduce the price pressure on SMEs by enlarging markets. Already as a result of regulation in this space, Alibaba-owned apps such as Ele.me and Kaola have begun to offer some rival WeChat Pay functionality (Reuters, 2021).

Given their underspecification, enforcement of the Regulations remains an open question. But guidance issued alongside these hold out the promise – over the next three years – of being able to '[o]rganize and establish specialized technology assessment teams; deeply analyze algorithmic mechanisms; assess the flaws and vulnerabilities in algorithm design, deployment, use, and other application segments; research the ideological, social justice, moral, ethical, and other security risks engendered by the application of algorithms; and put forward focused response measures' (Tai, 2022). This provision apparently signals intent on the part of government to undermine the proprietary status of algorithms where they are deemed socially harmful, and for state bodies to "crack open" and rewrite code in such cases.

Significantly, and as in the case of the food courier apps discussed above, the government has also signalled that it wishes to end intense algorithmic scrutiny and exploitation in the workplace. It appears to have in mind a key role on the part of the state trade union in enforcing changes to algorithms used by labour platforms (Popov, 2022, Borak, 2022). This could open space for labour to have an input into algorithmic design – a first in global terms for large, commercial digital platforms. However, strict limits upon trade union activity and ongoing state control mean that such initiatives are unlikely to go significantly further than ensuring that already-existing rights are respected and fair remuneration is paid.

EUROPEAN COMPARISONS AND SUMMARY

We are entering a period of algorithmic regulation (Clarke, 2021).

European regulatory initiatives are unfolding parallel to those that have taken place in China – although at a steadier pace.

The EU published its draft proposals for a flagship AI Act (AIA) in April 2021, still under debate at the time of writing (European Commission, 2021). Furthermore, agreement was reached on a Digital Services Package (DSP) in spring of 2022, including (limited) regulatory access to, and oversight of, platforms' algorithms. The UK, similarly, has set out in its 2021 AI Roadmap a plan to 'develop a pro-innovation national position on governing and regulating AI' (UK Government, 2021).

The major distinguishing feature of European regulation for AI and algorithms is its emphasis on upholding fundamental individual rights – such as privacy, ethical decision-making and data security – against (principally US-based) tech firms (Greenleaf, 2021). The draft AIA, for instance, includes outright bans on decision-making algorithms in cases where they pose a threat to 'safety, livelihoods and rights of people'. From the perspective of individuals, then, Europe's regulatory drive is preferable to that of China's – which places little emphasis on privacy or fundamental rights. But it does little to tackle issues beyond individual concerns. As one report argues, recommendation algorithms 'may cause societal-level harms, even when they cause only negligible harms to individuals' (by, for instance, tipping the balance in an election by discouraging wavering voters from turning out) (Future of Life Institute, 2022). Particularly lacking in the AIA and the DSP in this instance is a focus on employment and workers' collective rights (Del Castillo, 2021). A recent draft 'Platform Workers' Directive'⁶ does state an intention to regulate algorithmic management for both the employed and self-employed, but it remains to be seen how well integrated and consistent any legislation in this area will be with the flagship DSP and AIA.

Even in an age of growing algorithmic regulation, then, China's 'social' model contrasts with the emerging 'individualist' European regulatory model. China's emergent regulatory system targets areas hardly touched by Europe's flagship regulations, such as when it seeks to constrain undesirable social outcomes of algorithmic recommendation systems, dramatically reduce corporate data-siloing, and enhance the infrastructural power of the state to use platforms to achieve political and economic outcomes. Surprisingly (given China's weak record in ratifying ILO provisions),⁷ to the extent that this regulatory model incorporates unions as agents of enforcement, it offers a path-breaking effort to embed the influence of trade unions and labour rights within algorithmic management systems. Euro-

6. See: https://ec.europa.eu/commission/presscorner/detail/en/ip_21_6605

7. See: https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:11200:0::NO::P11200_COUNTRY_ID:103404

pean policymakers remain at a very early stage of considering how social partners might be incorporated into processes of algorithmic regulation and design.

If the period of unconstrained private algorithmic power is coming to an end, questions remain as to what will take its place: a reasonably similar economy to today's, albeit with more regulatory intervention at the margins to limit significant harm? Or something far more dramatic in terms of encroachment by the state and other social forces like labour movements on digital technologies? China's model for regulating algorithms will serve as an important model in years to come.

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