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## Beyond the Great Power Competition Narrative: Exploring Labor Politics and Resistance behind AI Innovation in China

Yujia He

*University of Kentucky, yujia.he@uky.edu*

Hong Shen

*Carnegie Mellon University, hongsh@andrew.cmu.edu*

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# POLICY FORUM

## Beyond the Great Power Competition Narrative: Exploring Labor Politics and Resistance behind AI Innovation in China

*Yujia He and Hong Shen*

### Introduction

A specter is haunting the world—the specter of artificial intelligence (AI). In the eyes of many, the major powers of the world have entered into an arms race in AI development. Policymakers in countries such as the United States, China, Japan, and South Korea justify the clamor for grand strategy and funding for AI research and development (R&D) on the basis of not being left behind in the race to automation.<sup>1</sup> Business leaders and political pundits likewise tout AI and the “Fourth Industrial Revolution” as crucial to cementing international competitiveness and the future global order.<sup>2</sup> It is easy to assume that whoever gets the upper hand in AI development will be handed the key to future economic prosperity, political prestige, and by extension, national power. Such a narrative frames AI development as a competitive race and is especially popular in the context of U.S.-China relations, where the U.S. approach has shifted from engagement

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<sup>1</sup> Exec. Order No. 13859, 84 Fed. Reg. 3967 (Feb 11, 2019), <https://www.federalregister.gov/documents/2019/02/14/2019-02544/maintaining-american-leadership-in-artificial-intelligence>; The President’s Council of Advisors on Science and Technology, Recommendations on Strengthening American Leadership in Industries of the Future, June 2020, [https://science.osti.gov/-/media/\\_/pdf/about/pcast/202006/PCAST\\_June\\_2020\\_Report.pdf?la=en&hash=019A4F17C79FDEE5005C51D-3D6CAC81FB31E3ABC](https://science.osti.gov/-/media/_/pdf/about/pcast/202006/PCAST_June_2020_Report.pdf?la=en&hash=019A4F17C79FDEE5005C51D-3D6CAC81FB31E3ABC); Ministry of Science and Technology, “Next Generation Artificial Intelligence Development Plan Issued by State Council,” China Science and Technology Newsletter no. 17, September 15, 2017, <http://fi.china-embassy.org/eng/kxjs/P020171025789108009001.pdf>; Integrated Innovation Strategy Promotion Council Decision, “AI Strategy 2019 AI for Everyone: People, Industries, Regions and Governments,” Prime Minister’s Office of Japan, June 11, 2019, [https://www.kantei.go.jp/jp/singi/ai\\_senryaku/pdf/aistrategy2019en.pdf](https://www.kantei.go.jp/jp/singi/ai_senryaku/pdf/aistrategy2019en.pdf); “South Korea AI R&D Strategy,” OECD AI, <https://www.oecd.ai/dashboards/policy-initiatives/2019-data-policyInitiatives-25016>.

<sup>2</sup> Mohamed Kande and Murat Sönmez, “Don’t Fear AI. It Will Lead to Long-Term Job Growth,” World Economic Forum, October 26, 2020, <https://www.weforum.org/agenda/2020/10/dont-fear-ai-it-will-lead-to-long-term-job-growth>; John R. Allen and Amir Husain, “The Next Space Race Is Artificial Intelligence,” Foreign Policy, November 3, 2017, <https://foreignpolicy.com/2017/11/03/the-next-space-race-is-artificial-intelligence-and-america-is-losing-to-china>.

to “long-term strategic competition,” with maintaining technology dominance as a core concern.<sup>3</sup>

This AI competition narrative is flawed for several reasons.<sup>4</sup> To begin with, knowledge creation and diffusion is no longer confined within one country. Literature has documented the international interdependency of science and technology,<sup>5</sup> and the role of transnational capital, infrastructure, talents, and business alliances in innovation systems.<sup>6</sup> In AI-related research, for instance, international co-authorship accounts for on average 35 percent of publications by the world’s top R&D investors across all industries.<sup>7</sup> In addition, in much of the developing world, governments strategically collaborate with foreign companies for technology adoption and technology transfer.<sup>8</sup>

More importantly, this narrative focused on competitiveness, with its singular concern for utilitarian gains, risks equating technological advances and economic growth with societal well-being. Such an approach conveniently assumes innovation as inherently beneficial for a nation. Yet the development of new technologies and their impact on society is directional.<sup>9</sup> Innovation does not happen in a vacuum, but within a society with power asymmetries between stakeholders. Such power dynamics shape how innovations are

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<sup>3</sup> Department of Defense, Summary of the 2018 National Defense Strategy of the United States, January 2018, <https://apps.dtic.mil/sti/pdfs/AD1045785.pdf>; Satoru Mori, “US Technological Competition with China: the Military, Industrial and Digital Network Dimensions,” *Asia-Pacific Review* 26, no. 1 (2019): 77-120); Graham Allison and Eric Schmidt, “Is China Beating the U.S. to AI Supremacy?,” Belfer Center for Science and International Affairs, August 2020, <https://www.belfercenter.org/publication/china-beating-us-ai-supremacy>; Gregory Allen and Elsa B. Kania, “China Is Using America’s Own Plan to Dominate the Future of Artificial Intelligence,” *Foreign Policy*, September 8, 2017, <https://foreignpolicy.com/2017/09/08/china-is-using-americas-own-plan-to-dominate-the-future-of-artificial-intelligence>.

<sup>4</sup> Stephen Cave and Seán S. ÓhÉigeartaigh, “An AI Race for Strategic Advantage: Rhetoric and Risks,” in Proceedings of the 2018 AAAI/ACM Conference on AI, Ethics, and Society, AIES ’18 (New York, NY, USA: Association for Computing Machinery, 2018), 36–40; Remco Zwetsloot, Helen Toner, and Jeffrey Ding, “Beyond the AI Arms Race: America, China, and the Dangers of Zero-Sum Thinking,” *Foreign Affairs*, November 16, 2018, <https://www.foreignaffairs.com/reviews/review-essay/2018-11-16/beyond-ai-arms-race>.

<sup>5</sup> Michael Zitt and Elise Bassecoulard, “Internationalisation in Science in the Prism of Bibliometric Indicators,” in *Handbook of Quantitative Science and Technology Research*, eds. Henk F. Moed, Wolfgang Glänzel, Ulrich Schmoch, 407-436 (Dordrecht: Springer, 2004); Pari Patel and Modesto Vega, “Patterns of Internationalisation of Corporate Technology: Location vs. Home Country Advantages,” *Research Policy* 28, no. 2-3 (1999): 145-155.

<sup>6</sup> Christian Binz and Bernhard Truffer, “Global Innovation Systems—A Conceptual Framework for Innovation Dynamics in Transnational Contexts,” *Research Policy* 46, no. 7 (2017): 1284-1298.

<sup>7</sup> Helene Dernis, Petros Gkotsis, Nicola Grassano, Shohei Nakazato, Mariagrazia Squicciarini, Brigitte van Beuzekom, and Antonio Vezzani, *World Corporate Top R&D Investors: Shaping the Future of Technologies and of AI*, No. JRC117068 (Seville: Joint Research Centre, 2019).

<sup>8</sup> Stephen Feinson, “National innovation systems overview and country cases,” in *Knowledge flows and knowledge collectives: understanding the role of science and technology policies in development*, 23-25 (Center for Science, Policy and Outcomes, Columbia University, 2003), [https://cspo.org/legacy/library/110215F4ZY\\_lib\\_FeinsonInnovatio.pdf](https://cspo.org/legacy/library/110215F4ZY_lib_FeinsonInnovatio.pdf)

<sup>9</sup> Johan Schot and W. Edward Steinmueller, “Three Frames for Innovation Policy: R&D, Systems of Innovation and Transformative Change,” *Research Policy* 47, no. 9 (2018): 1554-1567.

used, why they are used, and whether they lead to better or worse long-term outcomes for various stakeholders.<sup>10</sup> Further, the great power competition narrative ignores the transnational interests and struggles of social groups and classes impacted by innovation development and diffusion. By placing innovation within the context of a zero-sum, short-term competition between nations, the narrative ignores the collective interests across borders of groups such as businesses, labor and trade unions, and the public, and their agency in shaping innovation towards benevolent or worse societal outcomes.

In this article, we argue that the lens of great power competition, though important, is insufficient and one-sided. China and the United States are actually facing the same set of challenges posed by the recent development and deployment of AI—its significant impact on human labor. Public imaginaries of AI's impact mostly concern job displacement, and scholars have documented the replacement of routine tasks by automation among both U.S. and Chinese manufacturers and the impact on workers' power.<sup>11</sup> The purpose of this paper, however, is to shed light on the less-explored areas. Using three cases from China, we explore novel forms of relations between labor and capital that have emerged behind contemporary AI developments: how crowdworkers have been put into "farms" for data annotation and algorithm evaluation, how tech workers are exploited to fuel rapid AI innovation, and how new types of algorithmic technologies are used to intensify and reinvent workplace surveillance. We also discuss different tactics workers employ for resistance. We conclude with an alternative, dialectic approach to understanding AI's impact on labor relations, calling for exchange and collaboration among stakeholders across countries including the United States and China to address the common challenges. Washington and Beijing must thus look beyond the oversimplifying great power competition narrative to deal with the granular human labor costs associated with AI development.

### **Hidden Labor Behind AI: Crowdworkers in China**

Past scholarship has pointed out that rather than being fully automated, contemporary AI systems have actually been supported by different types of invisible human labor—what

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<sup>10</sup> Elisa Giuliani, "Regulating Global Capitalism amid Rampant Corporate Wrongdoing—Reply to 'Three Frames for Innovation Policy,'" *Research Policy* 47, no. 9 (2018): 1577-1582; Mark Anner, Nicolas Pons-Vignon, and Uma Rani, "For a Future of Work with Dignity: A Critique of the World Bank Development Report, The Changing Nature of Work," *Global Labour Journal* 10, no. 1 (2019): 2-18; Louis Hyman, "It's Not Technology That's Disrupting Our Jobs," *New York Times*, August 18, 2018, <https://www.nytimes.com/2018/08/18/opinion/technology/technology-gig-economy.html>.

<sup>11</sup> David Autor, David Mindell, and Elisabeth Reynolds, *The Work of the Future: Building Better Jobs in an Age of Intelligent Machines*, MIT Work of the Future, 2020, <https://workofthefuture.mit.edu/wp-content/uploads/2021/01/2020-Final-Report4.pdf>; CEES Research Team, "How are Chinese Manufacturing Firms Coping with Rising Labor Costs: A Report of China Employer-Employee Survey (2015-2016)," *Journal of Macro-Quality Research* 5, no. 2 (2017): 1-21; Yu Huang and Naubahar Sharif, "From 'Labour Dividend' to 'Robot Dividend': Technological Change and Workers' Power in South China," *Agrarian South: Journal of Political Economy* 6, no. 1 (2017): 53-78; Naubahar Sharif and Yu Huang, "Industrial Automation in China's 'Workshop of the World,'" *The China Journal* 81, no. 1 (2019): 1-22.

Gray and Suri termed as “ghost work.”<sup>12</sup> Crowdsourced workers have long been an important part of this “ghost work.” As scholars have discussed, many critical fields in contemporary AI (for example, Computer Vision<sup>13</sup> and Natural Language Processing<sup>14</sup>) rely on large-scale human labor for data annotation and algorithm evaluation, which has been increasingly outsourced to a variety of crowdsourcing platforms. An example of a U.S.-based platform is Amazon Mechanical Turk (Mturk), operated under Amazon Web Services for businesses (known as requesters) to hire online crowdworkers to perform on-demand tasks.<sup>15</sup>

China is an important node in this globalized crowdsourcing landscape. By the end of 2017, there were already 30 million crowdworkers in China serving more than 190,000 enterprises and individuals on a global level. Chinese government policies, such as the “mass entrepreneurship and mass innovation program,” contributed to the boom. Moreover, in China, crowdworkers have also been put into “crowdfarms.”<sup>16</sup> Instead of on-demand individuals working on decomposed tasks, crowdfarm workers in China are organized by companies like ZBJ and Epwk, which often take crowdsourced work en masse from requesters, and organize individual workers to complete them. Crowdfarm workers usually work full time with salary and benefits, yet workers also reported exhaustion from overwork and frequent delays in compensation.<sup>17</sup> Some crowdfarm workers have also reported substandard working conditions, such as cramped office spaces that lack air-conditioning. The growing power of crowdfarms in China has also generated increasing pressure for individual crowdworkers. For example, crowdfarms

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<sup>12</sup> Mary L. Gray and Siddharth Suri, *Ghost Work: How to Stop Silicon Valley from Building a New Global Underclass* (Boston: Houghton Mifflin Harcourt, 2019).

<sup>13</sup> Computer Vision is a field of artificial intelligence that trains computers and systems to “derive meaningful information from digital images, videos and other visual inputs — and take actions or make recommendations based on that information” (“What is Computer Vision?,” IBM, <https://www.ibm.com/topics/computer-vision>). An example of a problem in Computer Vision is facial recognition, to match a human face from digital images or videos against databases of faces to authenticate the identity of the person.

<sup>14</sup> Natural Language Processing (NLP) is a field of artificial intelligence that “trains computers to understand, interpret and manipulate human language” (“What is Natural Language Processing?,” SAS, [https://www.sas.com/en\\_us/insights/analytics/what-is-natural-language-processing-nlp.html](https://www.sas.com/en_us/insights/analytics/what-is-natural-language-processing-nlp.html)). An example of NLP in applications is a virtual assistant like Alexa or Siri that interprets the voice command of users and responds accordingly.

<sup>15</sup> Lilly Irani, “The Cultural Work of Microwork,” *New Media and Society* 17, no. 5 (2013): 1-21; Lilly C. Irani and M. Silberman, “Turkopticon: Interrupting Worker Invisibility in Amazon Mechanical Turk,” in *Proceedings of the 2013 CHI Conference on Human Factors in Computing Systems* (2013): 611–20; Kate Crawford and Trevor Paglen, “Excavating AI: The Politics of Images in Machine Learning Training Sets,” 2019, <https://www.excavating.ai/>; Kate Crawford and Vladan Joler, “Anatomy of an AI System,” <https://anatomyof.ai/>.

<sup>16</sup> Yihong Wang et al., “Crowdsourcing in China: Exploring the Work Experiences of Solo Crowdworkers and Crowdfarm Workers,” *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems* (2020): 1–13.

<sup>17</sup> Bailing Yi, “Rengong zhineng beihou de rengong: shuju biao zhu shixin suoshui yi ban, qianxin gaofa” 人工智能背后的‘工人’:数据标注时薪缩水一半, 欠薪高发 [The “Workers” behind Artificial Intelligence: Data Shows Hourly Salaries Have Shrunk by Half, High Incidence of Overdue Salaries], *Di Yi Caijing*, November 25, 2020, <https://www.yicai.com/news/100852901.html>.

often undercut their bids in order to secure more jobs, which has decreased the overall pricing of crowdsourcing tasks on the market. As crowdfarms increasingly dominate the crowdsourcing landscape in China, individual crowdworkers will face the pressure to lower their bids as well.<sup>18</sup>

As tech firms increasingly outsource labor-intensive tasks like sound recognition and video and image labeling to save costs, crowdworkers in China have become part of the global AI value chain.<sup>19</sup> While this leads to job creation in number, and may benefit people seeking flexible work, it offers workers unstable pay and limited career advancement. An International Labour Organization (ILO) study of Chinese crowdsourcing platforms cautioned that unpaid time spent searching for tasks, seeking clarifications from requesters and platforms, and contesting nonpayment and negative reviews led to long and fragmented working hours, and effectively lower earnings.<sup>20</sup> Most microtasks for crowdworkers, such as data labeling or transcription, are simple and repetitive, therefore offering little opportunities for career growth. With future development of AI, these workers may also one day find their tasks becoming fully automated, and their training and work experience obsolete.

Indeed, as Gray and Suri argue, the development of AI has partially contributed to the rise of a “new global underclass” with low and unstable wages, substandard working conditions, and few opportunities to apply their work experiences to new jobs.<sup>21</sup> The experiences of Chinese crowdworkers offer an important case to illustrate the conditions of this new global class of workers.

### **Tech Workers’ Resistance: The 996.ICU Movement**

Tech workers have been a major force behind contemporary AI development. However, rather than serving as the silent “secret source” or the massive “brain power” behind China’s surge in the global AI landscape, Chinese tech workers have mobilized to resist increasingly harsh labor exploitation.

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<sup>18</sup> Wang et al., “Crowdsourcing in China: Exploring the Work Experiences of Solo Crowdworkers and Crowdfarm Workers,” 6-7.

<sup>19</sup> Dmitry Matskevich, “Low-wage workers drive the global AI labor market,” VentureBeat, December 12, 2017, <https://venturebeat.com/2017/12/12/low-wage-workers-drive-the-global-ai-labor-market/>; Huizong Wu, “China Is Achieving AI Dominance by Relying on Young Blue-Collar Workers,” Vice, December 21, 2018, <https://www.vice.com/en/article/7xyabb/china-ai-dominance-relies-on-young-data-labelers>; Miaomiao Yu, “The Humans Behind Artificial Intelligence,” Synced, April 30, 2017, <https://medium.com/syncedreview/the-humans-behind-artificial-intelligence-3ff578cfcc60>.

<sup>20</sup> Irene Zhou, “Digital Labour Platforms and Labour Protection in China,” International Labour Organization Working Paper 11, October 2020, [https://www.ilo.org/wcmsp5/groups/public/---asia/--ro-bangkok/---ilo-beijing/documents/publication/wcms\\_757923.pdf](https://www.ilo.org/wcmsp5/groups/public/---asia/--ro-bangkok/---ilo-beijing/documents/publication/wcms_757923.pdf).

<sup>21</sup> Mary L. Gray and Siddharth Suri, *Ghost Work: How to Stop Silicon Valley from Building a New Global Underclass* (Boston: Houghton Mifflin Harcourt, 2019).

Indeed, China offers an important case to illustrate the exploitation of the tech labor force behind the rapid development of AI. A recent example is the 996.ICU movement. Despite being relatively well paid compared to traditional industries, tech employees in China have been asked to work an extended schedule known as the “996 schedule”: 9AM to 9PM, 6 days a week.<sup>22</sup> The economic downturn and the downsizing of the tech sector in particular since 2018 have cultivated growing discontent toward the 996 overwork culture. This is because the past reciprocal employment relationship has been disrupted—workers still work the extended long hours, but report getting much less compensation in bonuses, with limited career advancement amidst waves of layoffs.<sup>23</sup> In March 2019, an anonymous user set up the 996.ICU project on GitHub, an online code sharing community owned by Microsoft, complaining that serious labor exploitation would eventually destroy employees’ health and send them to the intensive care unit (ICU).<sup>24</sup>

Unlike traditional labor movements in the manufacturing sector, during the 996.ICU movement Chinese tech workers employed “networked and disconnected” tactics to introduce public pressure to their employers to cause reputational damage.<sup>25</sup> This included setting up a repository on GitHub for “blacklist companies” that have a similar overworking schedule, such as Alibaba, Jingdong (JD), and Huawei, and calling on fellow workers and netizens to mail China’s Labor Law, which specifically forbids such labor exploitation, to Jack Ma—the founder of Alibaba who commented that the 996 schedule could be a “huge blessing” for young workers and only backtracked following online backlash.<sup>26</sup> Workers started to form a shared identity by recognizing themselves as “white-collar working-class developers,” and even framed the movement as a class struggle between the working class and capitalists.<sup>27</sup> A new basis of international solidarity also emerged. For example, a group of GitHub and Microsoft workers openly supported Chinese workers by calling on Microsoft to keep the 996.ICU project uncensored.<sup>28</sup>

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<sup>22</sup> Qiqing Lin and Raymong Zhong, “996’ Is China’s Version of Hustle Culture. Tech Workers Are Sick of It,” *New York Times*, April 29, 2019, <https://www.nytimes.com/2019/04/29/technology/china-996-jack-ma.html>.

<sup>23</sup> Xiaonan Li, “The 996.ICU Movement in China: Changing Employment Relations and Labour Agency in the Tech Industry,” *Made in China Journal* 4, no. 2 (June 18, 2019), <https://madeinchina-journal.com/2019/06/18/the-996-icu-movement-in-china-changing-employment-relations-and-labour-agency-in-the-tech-industry>; Takashi Kawakami, “Wave of Layoffs Washes Over China’s Tech Giants,” *Nikkei Asia*, March 22, 2019, <https://asia.nikkei.com/Business/China-tech/Wave-of-layoffs-washes-over-China-s-tech-giants>

<sup>24</sup> “996icu/996.ICU,” GitHub, <https://github.com/996icu/996.ICU>.

<sup>25</sup> Kevin Lin, “Tech Worker Organizing in China: A New Model for Workers Battling a Repressive State,” *New Labor Forum* 29, no. 2 (May 1, 2020): 56–58.

<sup>26</sup> The online call for “Mailing Labor Law to Jack Ma” and the netizens’ posts of the mailed Labor Law copies can be accessed at the GitHub at <https://github.com/CPdogson/996action/blob/master/54law/pic.md>.

<sup>27</sup> Lichen Zhen, “Social Coding Platform as Digital Enclave: A Case Study of Protesting ‘996’ on GitHub,” *International Journal of Communication* 15 (2021): 19.

<sup>28</sup> Caroline O’Donovan, “A Post about China’s ‘996’ Workweek Went Viral on GitHub: Now Microsoft Employees Want to Protect It from Censorship,” *BuzzFeed News*, April 22, 2019, <https://www.buzzfeednews.com/article/carolineodonovan/microsoft-petition-996-icu-workweek-china>.



Although the 996.ICU movement was criticized for failing to generate structural changes,<sup>29</sup> it has nevertheless demonstrated the agency of tech workers behind the curtain of China's AI innovations and their resistance against inhumane working conditions. Similarly, in the United States, tech workers have also mobilized around issues like sexual harassment, gender inequities, and unethical research.<sup>30</sup> Often seen as elitist and difficult to organize, tech workers in both countries are mobilized to resist what they perceive to be unethical and intolerable behaviors in their own industries.

### **Watched by the Algorithmic Boss: The Intensification of Workplace Surveillance**

The ubiquity of AI-enabled services has given rise to “surveillance capitalism,” where behavioral data harvested by tech firms about consumers is used to enhance algorithms and provide predictions.<sup>31</sup> This, in turn, is sold to business consumers, essentially rendering users as “free commodities” under surveillance. Such automated predictive analytics have also aided the already pervasive surveillance of workers. Workplace surveillance is often deployed for enhancing productivity and security, but may also result in the erosion of workers' privacy, and results-based management ignoring workers' needs.<sup>32</sup> As reported by BBC in 2019, over half of global companies with over USD 750 million revenues used nontraditional surveillance methods, including tracking keystrokes, monitoring emails and monitoring conversations at work.<sup>33</sup> A 2012 report found that 37 percent of U.S. employers tracked the locations of workers on service calls via handheld devices or vehicles.<sup>34</sup> Surveillance has also grown outside the workplace, including GPS tracking on employees' phones, social media monitoring, and even exercise and sleep pattern tracking.<sup>35</sup> Workforce analytics is predicted to become a USD 1.87 billion industry by 2025.<sup>36</sup> For instance, Amazon has developed AI-enabled tools like wristbands to track

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<sup>29</sup> Kevin Lin, “Tech Worker Organizing in China,” 58.

<sup>30</sup> Kate Conger and Noam Scheiber, “Employee Activism Is Alive in Tech. It Stops Short of Organizing Unions,” *New York Times*, July 8, 2019, <https://www.nytimes.com/2019/07/08/technology/tech-companies-union-organizing.html>.

<sup>31</sup> Shoshana Zuboff, “Surveillance Capitalism and the Challenge of Collective Action,” *New Labor Forum* 28, no. 1 (2019): 10–29.

<sup>32</sup> Kirstie Ball, “Workplace Surveillance: An Overview,” *Labor History* 51, no. 1 (2010): 93–100.

<sup>33</sup> Padraig Belton, “How Does It Feel to Be Watched at Work All the Time?” *BBC News*, April 11, 2019, <https://www.bbc.com/news/business-47879798>.

<sup>34</sup> Spencer E. Ante and Lauren Weber, “Memo to Workers: The Boss is Watching: Tracking Technology Shakes Up the Workplace,” *Wall Street Journal*, October 22, 2013, <https://www.wsj.com/articles/SB10001424052702303672404579151440488919138>.

<sup>35</sup> Lewis Maltby, “Employment Privacy: Is There Anything Left?” *Human Rights* 39, no.3 (2013). [https://www.americanbar.org/groups/crsj/publications/human\\_rights\\_magazine\\_home/2013\\_vol\\_39/may\\_2013\\_n2\\_privacy/employment\\_privacy](https://www.americanbar.org/groups/crsj/publications/human_rights_magazine_home/2013_vol_39/may_2013_n2_privacy/employment_privacy); Luke Tredinnick and Claire Laybats, “Workplace Surveillance,” *Business Information Review* 36, no. 2 (2019): 50–52; Christopher Rowland, “With Fitness Trackers in the Workplace, Bosses Can Monitor Your Every Step — and Possibly More,” *Washington Post*, February 15, 2019, [https://www.washingtonpost.com/business/economy/with-fitness-trackers-in-the-workplace-bosses-can-monitor-your-every-step--and-possibly-more/2019/02/15/75ee0848-2a45-11e9-b011-d8500644dc98\\_story.html](https://www.washingtonpost.com/business/economy/with-fitness-trackers-in-the-workplace-bosses-can-monitor-your-every-step--and-possibly-more/2019/02/15/75ee0848-2a45-11e9-b011-d8500644dc98_story.html).

<sup>36</sup> Belton, “How Does It Feel to Be Watched at Work All the Time?”

employees' activities,<sup>37</sup> and management systems that could fire employees without human supervisors' involvement.<sup>38</sup> The shift to working from home during the COVID-19 pandemic has further normalized the deployment of algorithmic surveillance tools, such as software running in the background of employees' personal computers to assess productivity.<sup>39</sup>

Like their counterparts in developed countries, Chinese workers also face an escalation of AI-enabled workplace surveillance, often without their consent and consultation. For instance, an electronics producer in Wuxi introduced an automated management system to monitor workers' productivity as required by its U.S. headquarters, using data from surveillance cameras and employees' punch cards. This resulted in dubious situations in salary calculation as reported by workers, such as an automatic deduction of RMB 50 for three seconds over time in the restroom. Another tech firm in Hangzhou mandated employees to use company-provided chair cushions, tracking personal data such as heart rate, breathing and posture to predict workers' productivity without their consent. Such practices are not limited to subsidiaries of foreign firms or private firms. A state-owned electricity firm in Beijing used a management system that automatically adjusted workers' bonuses based on their company card activity. When an employee had more than five instances in a month of physically leaving the workplace and using the card during working hours, even for legitimate reasons such as going to the supermarket to buy food, the system would automatically deduct a portion of the worker's annual bonus. As the company deliberately withheld such surveillance practices from the employees, few employees were aware that their geolocational timeline and spending data were being surveilled.<sup>40</sup>

The prospect of resisting algorithmic workplace surveillance is uncertain. Workers in developed countries can turn surveillance into a "base for organizing," as several unions in the United States have negotiated employment contracts that bar practices such as the use of GPS tracking for disciplinary action and email monitoring beyond reasonable cause.<sup>41</sup> In other Global North countries such as France, workplace surveillance with-

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<sup>37</sup> Ceylan Yeginsu, "If Workers Slack Off, the Wristband Will Know. (And Amazon Has a Patent for It.)," *New York Times*, February 1, 2018, <https://www.nytimes.com/2018/02/01/technology/amazon-wristband-tracking-privacy.html>.

<sup>38</sup> Julie Bort, "Amazon's Warehouse-Worker Tracking System Can Automatically Pick People to Fire Without a Human Supervisor's Involvement," *Business Insider*, April 25, 2019, <https://www.businessinsider.com/amazon-system-automatically-fires-warehouse-workers-time-off-task-2019-4>.

<sup>39</sup> Will D. Heaven, "This Startup Is Using AI to Give Workers a "Productivity Score," *MIT Technology Review*, June 4, 2020, <https://www.technologyreview.com/2020/06/04/1002671/startup-ai-workers-productivity-score-bias-machine-learning-business-covid>.

<sup>40</sup> Liu Chang, "Bei suanfa jiankong de dagong ren: you ren qu xishoujian chaoshi 3 miao kou gongzi shangban mai fan bei kou wugong fei" 被算法监控的打工人：有人去洗手间超时3秒扣工资上班买饭被扣误工费 [The Workers Monitored by Algorithm: Salary Deduction for Spending Three Seconds too Long in the Bathroom, Tardiness Fee Charged for Buying Meal], *Caijing*, January 23, 2021, [https://www.sohu.com/a/444087044\\_120774106](https://www.sohu.com/a/444087044_120774106).

<sup>41</sup> Dan Clawson and Mary Ann Clawson. "IT Is Watching: Workplace Surveillance and Worker Resistance," *New Labor Forum* 26, no. 2 (2017): 66-68.

out consultation with the workers' council is a criminal offense.<sup>42</sup> In comparison, legal protection of an employee's privacy rights has been relatively weak in China.<sup>43</sup> While the draft Law on the Protection of Personal Information, circulated in 2020, offers the potential of requiring consent in data gathering, it remains to be seen how such laws will be finalized and implemented.<sup>44</sup> Combined with the employer-employee power asymmetry, employers will likely still have significant room to obtain personal data for surveillance.

## Conclusion

In this article, we drew upon three cases from China to explore novel forms of labor-capital relationships that have emerged with the development and deployment of AI systems. Moving beyond the well-documented impact of AI on manufacturing labor, we shifted our attention to the often hidden and invisible crowdworkers sitting behind many contemporary AI systems, the “white-collar working-class developers” exploited by China's tech industry, and the everyday workers that have been increasingly monitored and surveilled by algorithmic tools. We also noted new forms of resistance emerging from our cases, echoing many similar practices in the Global North. Indeed, in some cases, a new basis of international solidarity has also started to unfold, as we discussed in the case of the 996.ICU movement.

We therefore echo the scholarship calling for a dialectical, nuanced approach to understanding the changing nature of work in China and in the Global South.<sup>45</sup> We do not side with the technology-deterministic approach that emphasizes AI's potential for productivity and economic growth, and an arms-race view of interstate relations as a zero-sum game of catching up in innovation development and adoption. Such an approach favors the benefits accrued to transnational capital and reduces labor to a factor of production to be upgraded, educated, and reskilled in the face of algorithms. It further ignores the agency of labor, and other societal actors, to shape how the adoption of AI will unravel in each society around the world. On the other hand, we also caution against an overly optimistic view that the power of labor in each society, and their collective power across the world, can effectively shape the policy discussions around AI and the course of AI adoption towards more humane outcomes. In developed economies such as the EU and United States, workers have resisted an unfair working environment with the help of relatively strong social protection, labor unionization, and labor policies. Calls against the monopolizing power of Big Tech are also growing among policymakers and scholars, and workers themselves have organized to bargain for their interests. In comparison, as this

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<sup>42</sup> Ann C. Hodges, “Bargaining for Privacy in the Unionized Workplace,” *International Journal of Comparative Labour Law and Industrial Relations* 22, no. 2 (2006): 174.

<sup>43</sup> Mimi Zou, “Rethinking Online Privacy in the Chinese Workplace: Employee Dismissals over Social Media Posts,” *Made in China Journal*, October 18, 2018, <https://madeinchinajournal.com/2018/10/18/rethinking-online-privacy-in-the-chinese-workplace>.

<sup>44</sup> Anja Geller, “How Comprehensive Is Chinese Data Protection Law? A Systematisation of Chinese Data Protection Law from a European Perspective,” *GRUR International* 69, no. 12 (2020): 1193, 1197, 1202.

<sup>45</sup> See Huang and Sharif, “From ‘Labour Dividend’ to ‘Robot Dividend.’”

study of China shows, workers are being roped in the global capitalist networks underpinning AI-enabled innovations, while facing precarious working conditions with little guaranteed protection. Understanding of the working conditions currently relies more on personal accounts or news stories than rigorous data, and is further constrained by the workers' limited awareness of their structural positions of being exploited. Government policies provide limited regulatory guidance or enforcement, and uncertain bargaining power for workers seeking fairer treatment. Similar dynamics have been observed in other Global South countries such as India, Brazil, and the Philippines.<sup>46</sup>

With increasing diffusion of innovation and the expansion of Big Tech into the Global South, workers in those countries have increasingly become a crucial part of the global value chain of AI. Their working conditions and the issues arising from the labor contentions in such countries will only become more salient. As AI gets increasingly adopted in all corners of life, there is growing scholarly and media attention on the plight of the workers. Whether this would provoke greater consciousness among the workers and the larger society to demand policy actions, however, is an open question. This presents an opportunity for international cooperation, in terms of exchanging information and data, searching for solutions, and formulating and implementing government regulations and best practices.<sup>47</sup> Greater awareness, communication, and cooperation among policymakers, practitioners, scholars, workers, NGOs, and other concerned actors is needed. Exchanges across national borders, including among the two largest economies, the United States and China, would be vital, to help ensure workers' well-being, and the global transition towards a more economically and socially equitable machine age.

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<sup>46</sup> Munsif Vengattil and Paresh Dave, "Facebook 'Labels' Posts by Hand, Posing Privacy Questions," Reuters, May 5, 2019, <https://www.reuters.com/article/us-facebook-ai-focus/facebook-labels-posts-by-hand-posing-privacy-questions-idUSKCN1SC01T>; Mary L. Gray and Siddharth Suri, "The Humans Working behind the AI Curtain." *Harvard Business Review* 9 (2017): 2-5; Felix Holtwell, "We Must Think about a Tech Workers' Strike": An Interview with the Infoproletários," *Notes from Below*, October 1, 2018, <https://notesfrombelow.org/article/we-must-think-about-a-tech-workers-strike>; Adrian Chen, "The Laborers Who Keep Dick Pics and Beheadings Out of Your Facebook Feed," *Wired*, October 23, 2014, <https://www.wired.com/2014/10/content-moderation>.

<sup>47</sup> Yujia He, "Developing Resilient Economies in the Age of AI," United Nations University Centre for Policy Research, December 7, 2018, <https://cpr.unu.edu/ai-global-governance-developing-resilient-economies-in-the-age-of-ai.html>.

**Yujia He** is an Assistant Professor at the Patterson School of Diplomacy and International Commerce, University of Kentucky. Her areas of expertise are international political economy, science and technology policy, and comparative politics in Asia. She obtained her Ph.D. in International Affairs, Science and Technology (IAST) from Georgia Tech.

**Hong Shen** is a Systems Scientist in the Human-Computer Interaction Institute at Carnegie Mellon University. Her research focuses on global Internet industry and policy (with an emphasis on China) as well as the social and policy implications of algorithmic systems. She received her Ph.D. in Communications from the University of Illinois at Urbana-Champaign.

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