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Syllabus: Artificial Intelligence and China[1]

In recent years, China's ambitious development of artificial intelligence (AI) has attracted much attention in policymaking and academic circles. This syllabus aims to broadly cover the research landscape surrounding China's AI ecosystem, including the context, components, capabilities, and consequences of China's AI development. The materials presented range from blogs to books, with an emphasis on English translations of Mandarin source materials. The reading list is not exhaustive, and it will benefit from feedback and revisions.

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1. General Introduction and Overview Pieces

This section includes readings that provide an overview of China's AI landscape. They will serve as good launching pads for more in-depth research of particular aspects of China's AI development. Parts of these sources that are especially relevant to other topics will be referenced in those sections as well.

- Allen, Gregory. (2019). "Understanding China's AI Strategy." *Center for a New American Security*. [PDF]
- China Institute for Science and Technology Policy at Tsinghua University. (2018). "China AI Development Report." [PDF]
- Ding, Jeffrey. (2018). "Deciphering China's AI Dream: The context, components, capabilities, and consequences of China's strategy to lead the world in AI." *Future of Humanity Institute.* [PDF]
- Fischer, Sophie-Charlotte. (February 2018). "Artificial Intelligence: China's High-Tech Ambitions." *Center for Security Studies, ETH Zurich*. [PDF]
- He, Yujia. (2017). "How China is Preparing for an AI-Powered Future." *Wilson Center*. [PDF]
    - *Yujia He's piece provides an excellent, concise summary of China's AI-related policies.*
- Webster, Graham [ed.]. (October 29, 2019) "AI Policy and China: Realities of State-Led Development." *Stanford-New America DigiChina Project*. [link]

A. Assessments of China's AI Capabilities

- Acharya, Ashwin and Zachary Arnold. (December 2019). "Chinese Public AI R&D Spending: Provisional Findings." *CSET Issue Brief*. [PDF]
- Ding, Jeffrey. (June 7, 2019). "China's Current Capabilities, Policies, and Industrial Ecosystem in AI." *Testimony before the U.S.-China Economic and Security Review Commission.* [PDF]
    - *Jeffrey Ding's written testimony systematically assesses China's AI capabilities versus those of the U.S. in an effort to address the "AI abstraction problem."*
- Ding, Jeffrey. (2018). "Deciphering China's AI Dream." *Future of Humanity Institute.* Part III: Capabilities. [PDF]
- MacroPolo. "ChinAI Digital Project." [link]; Sheehan, Matt. (July 16, 2019). "Much Ado about Data: How America and China Stack Up." MacroPolo [link] ; Ma, Joy Dantong. (April 15, 2019). "The AI Race is Wide Open, If America Remains Open." [link]; Ma, Joy Dantong. (July 30, 2019). "China's AI Talent Base Is Growing, and then Leaving." [link]

B. China's AI Development and International Competition

- Ahmed et al. "AI, China, Russia, and the Global Order: Technological, Political, Global, and Creative Perspectives." (2018). White paper, *A Strategic Multilayer Assessment (SMA) Periodic Publication*. [PDF]
- Hannas, Wm. C. and Huey-meei Chang. (September 2019). "China's Access to Foreign AI Technology." Center for Security and Emerging Technology. [link]
- Horowitz, Michael C. (September 12, 2018). "The Algorithms of August." *Foreign Policy.* [link]
  - *Michael Horowitz highlights how the obsession with U.S.-Sino competition in AI may miss a more important trend of AI propelling emerging and smaller powers to the forefront of defense innovation.*
- Zwetsloot, Remco, Helen Toner, and Jeffrey Ding. (November 16, 2018). "Beyond the AI Arms Race: America, China, and the Dangers of Zero-Sum Thinking." *Foreign Affairs*. [link]

C. Longer Reads on China's AI Landscape

- Lee, Kai-Fu. (2018). *AI Superpowers: China, Silicon Valley, and the New World Order.* Houghton Mifflin Harcourt. [link]
  - *Kai-Fu Lee's book offers an insider's perspective on the startup ecosystem producing China's AI unicorns.*
- Tencent Research Institute Legal Research Center of the China Information Communications Research Institute, Tencent AI Lab, and Tencent Open Platform. (2017). *Artificial Intelligence: A National Strategic Initiative*. Renmin University Press. Informal translations of select chapters can be found here: [link]
- Xiang, Nina. (2019). *Red AI: Victories and Warnings From China's Rise In Artificial Intelligence.* [link]
- Yang, Lan. (2017). *In Search of Artificial Intelligence [人工智能真的来了]*. Jiangsu Phoenix Literature and Art Publishing. Chinese edition only: [link]

D. Background Readings on China's Scientific and Technological Ambitions

- Schell, Orville and John Delury. (2013). *Wealth and Power: China's Long March to the 21st Century*. Abacus. [link]
- Segal, Adam. (2003). *Digital Dragon: High-Technology Enterprises in China.* Cornell University Press. [link]
- Shi-Kupfer, Kristen, and Mareike Ohlberg. (2019). "China's Digital Rise: Challenges for Europe." *MERICS*. [PDF]
  - *Mareike Ohlberg and Kristin Shi-Kupfer analyze China's digitization strategy, including implications for how AI will graft onto this overall transformation.*
- Wang, Jieshu. (October 17, 2018). "The Early History of Artificial Intelligence in China (1950s – 1980s)." Paper presented in the Graduate Student Workshop at 2018

Annual Meeting of the Society for the History of Technology (SHOT), St. Louis, MO. [link]

2. Official Documents and Government White Papers

This section includes documents and white papers put forward by the Chinese government. They are crucial for understanding how the central government views domestic AI development, which has implications for both local governments and the industry as a whole. For a must-read, see "A Next Generation Artificial Intelligence Development Plan." For those looking for a deep dive into Chinese policy considerations of the challenges AI presents on topics from cybersecurity to social stability, see the "Artificial Intelligence Security White Paper."

- China Academy for Information and Communications Technology. (2019). "Artificial Intelligence Security White Paper [excerpts]." (E. Kania, D. Peterson, L. Laskai, and G. Webster, Trans.). *Stanford-New America DigiChina Project.* [link]
- China Ministry of Industry and Information Technology. (2017). "Three-Year Action Plan for Promoting Development of a New Generation Artificial Intelligence Industry (2018–2020)." (P. Triolo, E. Kania, and G. Webster, Trans.). *Stanford-New America DigiChina Project.* [link]
- China State Council. (2017). "A Next Generation Artificial Intelligence Development Plan." (G. Webster, R. Creemers, P. Triolo, and E. Kania, Trans.). *Stanford-New America DigiChina Project*. [link]
- Ding, Jeffrey. (August 6, 2018). "ChinAI Newsletter #22: An Open Source AI Strategy - China's New White Paper on AI Open Source Software.," *ChinAI Newsletter*.([link]
  - *Includes translated excerpts of White Paper on AI Open Source Software.*
- People's Republic of China. (April 11, 2018). "Position Paper of China." Submitted at the United Nations Group of Governmental Experts of the High Contracting Parties to the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects. [PDF]
- Standards Administration of China. (2018). "White Paper on Artificial Intelligence Standardization [excerpts]." (J. Ding and P. Triolo, Trans.). *Stanford-New America DigiChina Project.* [link]
- Wang, Zhaobing, and Chang Sheng. (November 14, 2018). "Shaping the Political Attributes of Military Applications of Artificial Intelligence." (E. Kania, Trans.). *Study Times*. [link]

3. China's Approach to AI Governance

This section includes documents and analyses of Chinese AI ethics and governance efforts. Some major developments from 2019 have been documented in this list. For example, the piece on Governance Principles includes a profile of the newly established "New Generation

AI Governance Expert Committee." The "Beijing AI Principles" manifesto is arguably the most significant document on AI ethics to come out of China so far.

A. Chinese AI Ethics Documents and Statements

- Beijing Academy of Artificial Intelligence. "Beijing AI Principles." (2019). [link]
- Hickert, Cameron and Jeffrey Ding. (November 29, 2018). "Read What Top Chinese Officials Are Hearing About AI Competition and Policy." *Stanford-New America DigiChina Project*. [link]
- Laskai, Lorand, and Graham Webster. "Chinese AI Alliance Drafts Self-Discipline 'Joint Pledge'." *Stanford-New America DigiChina Project*. (English translation). [link]
- Webster, Graham. (2019). "Chinese Expert Group Offers 'Governance Principles' for 'Responsible AI'." *Stanford-New America DigiChina Project*. (English translation). [link]

B. Analyses of Chinese AI Governance Efforts

- Ding, Jeffrey, Paul Triolo, and Samm Sacks. (June 20, 2018). "Chinese Interests Take a Big Seat at the AI Governance Table." *Stanford-New America DigiChina Project*. [link]
- Gal, Danit. (June 7, 2019). "Perspectives and Approaches in AI Ethics: East Asia." *In* M. Dubber, F. Pasquale, and S. Das (Eds.), *Oxford Handbook of Ethics of Artificial Intelligence*. Oxford University Press. [link]
  - *Danit Gal's piece compares China's approach to AI ethics with that of Japan and South Korea.*
- Kania, Elsa. (April 17, 2018). "China's Strategic Ambiguity and Shifting Approach to Lethal Autonomous Weapons Systems." *Lawfare*. [link]
- Roberts et al. (December 2019). "The Chinese Approach to Artificial Intelligence: an Analysis of Policy and Regulation." Oxford Internet Institute Working Paper. [PDF]

C. Background Readings on China's Governance of Technology

- Ahmed, Shazeda and Steven Weber. (May 7, 2018). "China's Long Game in Techno-nationalism." *First Monday*. [link]
- Arnaldi et al. (August 2015). "Responsible Governance in Science and Technology Policy: Reflections from Europe, China, and India." *Technology in Society*. [link]
- Feng, Coco. (December 16, 2019). "A Year After Scandal in China, Gene-Editing Technology Advances." *South China Morning Post*. [link]

4. AI and the Chinese Economy

This section outlines a few reports that give a high-level overview of the possible effects of AI on China's economic development. It places particular emphasis on the firms that are driving the invention, innovation, and diffusion of AI technologies in China.

A. Impact of AI on China's Economy

- Barton et al. (2017). *Artificial Intelligence: Implications for China*. McKinsey Global Institute. [PDF]
- CSIS ChinaPower Project. "Is China Ready for Intelligent Automation?" [link]
  - *The CSIS China Power Project's piece gives a data-packed evaluation of China's readiness for automation.*
- Chen et al. (2019). "Automation Impacts on China's Polarized Job Market." *ArXiv preprint*. [PDF]
- Purdy, Mark, Serena Qiu, and Frank Chen. (2017). *How Artificial Intelligence Can Drive China's Growth*. Accenture. [PDF]

B. Profiles of Chinese AI Firms

- Cave, Danielle, Fergus Ryan, and Vicky Xiuzhong Xu. (November 28, 2019). "Mapping More of China's Tech Giants: AI and Surveillance." *Australian Strategic Policy Institute*. [link]
- CB Insights. (March 20, 2018). "China in AI Series." *CB Insights Research Brief*. [link]
- Hao, Karen. (January 22, 2019). "Three charts show how China's AI Industry is propped up by three companies." *MIT Technology Review.* [link]
- Min, Liu. (October 12, 2018). "那些给人工智能打工的人 [Those Who Work for AI]." *GQ China.* [original in Mandarin | ChinAI informal English translation]
  - *This article discusses data annotation workshops and the people who make a living in them. .*

C. Background Readings on China's Innovation Landscape

- Bound, Kirsten, Tom Saunders, James Wilsdon, and Jonathan Adams. (November 5, 2013). *China's Absorptive State: Innovation and Research in China.* Nesta. [PDF]
- Fuller, Douglas B. (2016). *Paper Tigers, Hidden Dragons. Firms and the Political Economy of China's Technological Development*. Oxford University Press. [link].
- Fu, Xiaolan. (2016). *China's Path to Innovation.* Cambridge University Press. [link]

5. AI in the Military Domain

This section focuses on China's strategy for developing and implementing AI for military applications. Some questions that are highlighted in the readings include how AI fits into China's military modernization goals,how the government tries to leverage commercial AI resources for military purposes, and what China's military AI ambitions could mean for the future of U.S.-China strategic competition.

A. International Security

- Allen, Gregory C. (2019). *Understanding China's AI Strategy*. CNAS. [PDF]

- Fu, Ying. (2019). "人工智能对国际关系的影响初析 [A Preliminary Analysis of the Impact of AI on International Relations]." [original in Mandarin | ChinAI informal English translation].
- Horowitz, Michael. (May 2018). "Artificial Intelligence, International Competition, and the Balance of Power." *Texas National Security Review*. [link]
- Kania, Elsa B. (November 2017). "Battlefield Singularity: Artificial Intelligence, Military Revolution, and China's Future Military Power." [PDF]

B. Civil-Military Fusion

- Kania, Elsa. (July 28, 2017). "The Dual-Use Dilemma in China's New AI Plan: Leveraging Foreign Innovation Resources and Military-Civil Fusion." *Lawfare*. [link]
- Laskai, Lorand. (April 9, 2018). "Civil-Military Fusion and the PLA's Pursuit of Dominance in Emerging Technologies." *China Brief* 6(18). [link]
- Nouwens, Meia. and Helena Legarda. (December 2018). *Emerging technology dominance: what China's pursuit of advanced dual-use technologies means for the future of Europe's economy and defence innovation*. IISS and MERICS. [PDF]
  - *This piece offers a comparison between China's pursuit of dual-use technologies, including AI,and European responses in defense innovation.*
- Tate et al. (May 12, 2018). *China's Advanced Weapons Systems*. IHS Markit for the US-China Economic and Security Review Commission. [PDF]

C. Background Readings on China's Military Modernization

- Cheung, Tai Ming. (2014). *Forging China's Military Might: A New Framework for Assessing Innovation*. Baltimore, MD: Johns Hopkins University Press. [link]
- Feigenbaum, Evan. (2003). *China's Techno-warriors: National Security and Strategic Competition from the Nuclear to the Information Age*. Palo Alto, CA: Stanford University Press. [link]
- Fisher, Richard D. (2010). *China's Military Modernization: Building for Regional and Global Reach*. Palo Alto, CA: Stanford University Press. [link]
- Fravel, M. Taylor. (2019). *Active Defense: China's Military Strategy Since 1949*. Princeton, NJ: Princeton University Press. [link]
- Levesque, Greg and Mark Stokes (December 2016). *Blurred Lines: Military-Civil Fusion and the "Going Out" of China's Defense Industry*. Pointe Bello. [PDF]

6. AI and Social Governance

This section attempts to untangle the impact of AI advances on a range of social issues, including the social credit system, privacy, surveillance, and propaganda. It includes analyses of the important distinction between "privacy" in the context of consumer protections against overstepping of tech companies and "privacy" in the sense of protections against government surveillance. Some pieces analyze how mass surveillance in Xinjiang takes the form of an integrated policing platform that aggregates data and flags potentially threatening people.

A. Social Credit System

- Ahmed, Shazeda. (May 1, 2019). "The Messy Truth About Social Credit." *Logic*. [[link](#)]
- Creemers, Rogier. (2018). "China's Social Credit System: An Evolving Practice of Control." [[PDF](#)]
- Dai, Xin. (2018). "Toward a Reputation State: The Social Credit System Project of China." [[link](#)]
  - *Dai Xin, a law professor at Ocean University in Qingdao, explores the social credit system as a reputational mechanism to tackle governance problems.*
- Hoffman, Samantha. (June 28, 2018). "Social Credit: Technology-enhanced authoritarian control with global consequences." *Australian Strategic Policy Institute*. [[link](#)]
- Zhang, Yuzhe, and Han Wei. (April 1, 2019). "In Depth: China's Burgeoning Social Credit System Stirs Controversy." Caixin. [[link](#)]

B. Privacy

- Ding, Jeffrey. (March 25, 2019). "ChinAI #47: The Sensenet Data Leak - What Actually Happened." *ChinAI Newsletter*. [[link](#)]
- Sacks, Samm and Lorand Laskai. (February 7, 2018). "China's Privacy Conundrum." *Slate*. [[link](#)]
- Webster, Graham and Scarlet Kim. (August 14, 2018). "The Data Arms Race is No Excuse for Abandoning Privacy." [[link](#)]

C. Surveillance

- Buckley, Chris andPaul Mozur. (May 22, 2019). "How China Uses High-Tech Surveillance to Subdue Minorities." *The New York Times.* [[link](#)]
- Ding, Jeffrey. (September 22, 2018). "ChinAI Newsletter #29: Complicit - China's AI Unicorns and the Securitization of Xinjiang." *ChinAI Newsletter*. [[link](#)]
- Ding, Jeffrey. (January 21, 2019). "ChinAI #44: Public Security Bureaus and 8 Future Applications of AI." *ChinAI Newsletter*. [[link](#)]
- Wang, Maya. (May 1, 2019). "China's Algorithms of Repression: Reverse Engineering a Xinjiang Police Mass Surveillance App." *Human Rights Watch*. [[link](#)]

D. Propaganda

- Ables, Kelsey. (June 21, 2018). "What happens when China's state-run media embraces AI?" *Columbia Journalism Review*. [[link](#)]
- Bolsover, Gillian. (2017). *Computational Propaganda in China: An Alternative Model of a Widespread Practice*. University of Oxford, Oxford Internet Institute. [[PDF](#)]
- Cadell, Cate. (March 4, 2019). "Propaganda 2.0 - Chinese Communist Party's message gets tech upgrade." *Reuters*. [[link](#)]
- Frisch, Nick. (May 2, 2019). "We Should Worry About How China Uses Apps like TikTok." *The New York Times (The Privacy Project)*. [[link](#)]

7. Party-Firm Relations

The set of readings in this section provides insights into the complex relations between the state and private enterprises in China. The analyses also discuss some implications of party-firm relations for technology innovation in China, as well as for U.S. national security. For instance, enhanced CCP control over AI firms may be at odds with the realization of China's ambitious AI strategy.

A. AI Firms and the CCP

- Feng, Ashley. (February 7, 2019). "We Can't Tell if Chinese Firms Work for the Party." *Foreign Policy*. [link]
  - *This article provides a nuanced analysis of how Chinese Communist Party (CCP) influence over Chinese firms has evolved since 2015.*
- Kania, Elsa B. (August 2, 2018). "China's AI Giants Can't Say No to the Party." *Foreign Policy*. [link]
- Jing, Meng and Sarah Dai. (November 21, 2017). "China recruits Baidu, Alibaba and Tencent to AI 'national team'." *South China Morning Post*. [link]

B. Background Readings on Party-Firm Relations

- Dickson, Bruce J. (2008). *Wealth into Power: The Communist Party's Embrace of the Private Sector*. Cambridge: Cambridge University Press. [link]
- Milhaupt, Curtis J. and Wentong Zheng. (2015). "Beyond Ownership: State Capitalism and the Chinese Firm." *The Georgetown Law Journal*, 665(103), 665-722. [PDF]
- Norris, William J. (2016). *Chinese Economic Statecraft: Commercial Actors, Grand Strategy and State Control*. Cornell University Press. [link]
- Wu, Mark. (2016). "The 'China, Inc.' Challenge to Global Trade Governance." *Harvard International Law Journal* 2(57). [PDF]
  - *Focus on Part 1: The Origin and Nature of the Challenge, especially its discussion of "six elements [that] render China's current economic structure distinct."*

8. Continuously Updated Sources

- ChinAI, a weekly newsletter by Jeffrey Ding, which features translations of writings from Chinese thinkers on China's AI landscape. [link]
- Stanford-New America DigiChina Project, a collaborative effort to analyze data governance, AI, and internet law developments in China through translating and analyzing Chinese-language sources. [link]
- Tech Buzz China, a biweekly SupChina podcast on China's innovation landscape, co-hosted by Ying-Ying Lu and Rui Ma. [link]
- Yuan Yang's weekly tech column for the Financial Times. [link]