Selected Papers of #AoIR2024:
The 25th Annual Conference of the
Association of Internet Researchers
Sheffield, UK / 30 Oct - 2 Nov 2024

BETTING ON (UN)CERTAIN FUTURES: SOCIOTECHNICAL IMAGINARIES OF AI AND VARIETIES OF TECHNO-DEVELOPMENTALISM IN ASIA

Hiu-Fung Chung
University of Toronto

Introduction

With the popularization of generative artificial intelligence (AI), building comprehensive AI developmental frameworks has been prioritized in national policy agendas worldwide. However, much literature on AI innovation often lean towards Euro-American-centric perspectives (Introna, 2016; Just & Latzer, 2017), regarding AI production and governance strategy – both normative and practical – as universally applicable (Adams, 2021; Fukuda-Parr & Gibbons, 2021; Mohamed et al., 2020).

Recent scholarship has increasingly focused on AI innovation and governance frameworks in non-Western societies, predominantly through critiquing data colonialism and Western digital imperialism and calling for decolonializing data-driven technology (Arora et al., 2023; Couldry & Mejias, 2023; Milan & Treré, 2019; Mumford, 2022; Singh, 2023). However, the state-of-the-art literature tends to focus on large nation-states like China (Bareis & Katzenbach, 2022; Roberts et al., 2021), or developing regions in Global South (Hassan, 2023), often overlooking economically advanced but geographically non-dominant societies. Studying the AI innovation discourses of these underrepresented societies can provide critical insights into the complexity and unevenness of global AI development. This paper contributes to this line of inquiry by conducting comparative studies of three Asian developmental societies – Singapore, Hong Kong, and Taiwan - through the conceptual lens of sociotechnical imaginaries.

Approaching Variegated Sociotechnical Imaginaries

Sociotechnical imaginaries refer to “collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of social life and social order attainable through, and supportive of, advances in science

Suggested Citation (APA): Chung, Hiu-Fung. (2024, October). *Betting on (Un)certain Futures: Sociotechnical Imaginaries of AI and Varieties of Techno-developmentalism in Asia*. Paper presented at AoIR2024: The 25th Annual Conference of the Association of Internet Researchers. Sheffield, UK: AoIR. Retrieved from http://spir.aoir.org.

and technology" (Jasanoff & Kim, 2015, p.6). As infrastructures of planning desirable futures (Sismondo, 2020), these imaginaries are shaped by past developmental trajectories, institutional settings, specific types of technoscientific capitalism, and regional geopolitics (Baur, 2023; Birch & Muniesa, 2020; Hodson & McMeekin, 2021; Kim, 2018).

In other words, national sociotechnical imaginaries are always entanglement and negotiation of local, regional and international politico-economic forces in specific socio-historical and institutional contexts. In this light, what are the desired forms of AI governance in small-size advanced economies? How does this desired form vary according to the historical, institutional, and geopolitical contexts of these societies?

Method and Data

To address these questions, this paper investigates the sociotechnical imaginaries of AI in three Asian societies—Singapore, Hong Kong and Taiwan—which, despite lacking global scale advantages, face unique challenges in AI development. Their strategies depend on local business ecosystems, international financial markets, transnational R&D collaboration, positioning in the global AI production network, and regional geopolitics.

Methodologically, the paper employs interpretive discourse analysis of governmental policy documents from these societies to understand how they construct and legitimize sociotechnical imaginaries (Sadowski & Bendor, 2019; Tidwell & Smith, 2015). Two main types of documents—AI strategies and tech-related policies, such as smart city blueprints and digital welfare plans—are analyzed to explore institutional framing of AI innovation, regulation, and claims about policy implementation, industry orientation and socio-political conditions (Curran & Smart, 2021). Documents from the early 2010s to 2024 were selected, a key period marking the adoption of Industry 4.0 discourse and smart urbanism in these societies (Appendix 1). Thematic analysis (Clarke & Braun, 2013) was used to identify key discursive tropes and differences across the three cases. First, I conducted a close reading of the policy documents to identify common themes. Second, I aggregated recurring themes, such as AI's inevitability, uncertainty, and strategic coupling, while identifying society-specific themes. Finally, I examined the relationships among these themes to understand how they form a coherent, though non-linear, narrative that constructs the AI imaginary in each society.

Three Orientations of Techno-Developmentalist Imaginaries

The central argument of this paper is that policy documents from three Asian societies manifest techno-developmental imaginaries of AI, with three distinct orientations. Techno-developmentalism refers to both an ideology and policy practice aimed at enhancing global competitiveness and regional advantages through technological innovation (Haggard, 2018; Lei, 2022). Three recurring themes emerge from the analysis. First, AI is portrayed as an all-encompassing technology of "augmented smartness," offering revolutionary solutions powered by advanced computation. Second, AI is framed as a disruptive force, reshaping both local societies and humanity at large, making it an inevitable necessity for socio-economic survival. Third, while the

tech-driven path to socio-economic progress is seen as inevitable, governing authorities must actively manage or harness AI. Across the three societies, policymakers establish AI frameworks that allocate resources, coordinate diverse stakeholders, strategically engage with the global tech economy (Yeung, 2016), and navigate the uncertainties inherent in AI-driven reforms. However, distinct imaginaries emerge in each society, shaped by unique socio-historical contexts and political cultures: (1) AI as a tool for *cybernetic pragmatism* in Singapore, (2) the *techno-entrepreneurial reconfiguration* of financial capitalism through AI in Hong Kong, and (3) AI as a *defensive strategy for economic nationalism* in Taiwan.

Singapore's one-party dominance is rooted in consistent ideological efforts that leverage pragmatic rhetoric to link the city-state's success with its ability to attract global capital, requiring a stable political system led by an experienced, meritocratic, and technocratic authoritarian government (Tan, 2012). Since 2014, under the framework of Smart Nation, Singapore has led East Asia in investing in data-driven technology for urban governance and digital public welfare, reflecting a data-solutionist vision of national branding. Notably, Singapore has made significant strides in AI integration within healthcare, with healthcare professionals receiving AI training, Synapxe (the national health tech agency) launching AI-powered health solutions in 2023, and the ongoing development of the Digital Mental Health Connect (DMHC) nationwide platform to enhance predictive, or even cybernetic, care in support of consolidating authoritarian legitimacy.

Post-colonial Hong Kong's distinct status, operating under the "One Country, Two Systems" constitutional framework, entices Chinese state-owned enterprises to see the city as a strategic offshore platform for capitalization, investment, internationalizing the renminbi (RMB), and acquiring sensitive Western technologies banned in mainland China (Hung, 2018). Now positioned as a regional technology hub within China's national planning, Hong Kong represents a techno-developmental pathway for refashioning China's state-driven financial capitalism. Given its nodal position in global capitalism since colonial times, Hong Kong has leveraged its historical legacy to attract international financing for AI innovation, envisioning a future rooted in techno-entrepreneurship within the global AI chain. Yet, the increasing economic dominance and political influence wielded by Chinese state-owned companies and their affiliated princeling elite pose a paradoxical threat to Hong Kong's autonomy from Beijing and risk undermining its unique standing in global financial capitalism (Hung, 2018).

Meanwhile, Taiwan, long a leading player in global semiconductor manufacturing, faces the dual challenge of addressing internal socio-economic instability and external threats from mainland China's global expansion and the China-US rivalry. This calls for a defensive yet export-oriented technoscientific strategy of AI. Since the mid-2010s, Taiwan has ambitiously positioned itself as an Asian Silicon Valley, strategically collaborating with local, national, and transnational actors, notably through the localized development of traditional Chinese large language models to protect its cultural sovereignty and attract Western tech capital to strengthen its national AI industry. Leveraging its reputation for effectively managing the COVID-19 pandemic, as well as its democratic institutions and civic culture, Taiwan projects a long-term defensive survival strategy to strengthen its tech-driven economic nationalism (Hsu, 2017).

In conclusion, this paper contributes to understanding the heterogeneous sociotechnical imaginaries of AI innovation beyond the binary of Global North and South. It also shed lights on a more contextual approach to the historicity of techno-developmentalism.

References

Adams, R. (2021). Can artificial intelligence be decolonized? *Interdisciplinary Science Reviews*, *46*(1–2), 176–197. https://doi.org/10.1080/03080188.2020.1840225

Arora, A., Barrett, M., Lee, E., Oborn, E., & Prince, K. (2023). Risk and the future of AI: Algorithmic bias, data colonialism, and marginalization. *Information and Organization*, *33*(3), 100478. https://doi.org/10.1016/j.infoandorg.2023.100478

Bareis, J., & Katzenbach, C. (2022). Talking AI into being: The narratives and imaginaries of national AI strategies and their performative politics. *Science, Technology, & Human Values*, *47*(5), 855–881. https://doi.org/10.1177/01622439211030007

Baur, A. (2023). European dreams of the cloud: Imagining innovation and political Control. *Geopolitics*, 1–25. https://doi.org/10.1080/14650045.2022.2151902

Birch, K., & Muniesa, F. (Eds.). (2020). *Assetization: Turning things into assets in technoscientific capitalism*. The MIT Press.

Clarke, V., & Braun, V. (2013). Teaching thematic analysis: Overcoming challenges and developing strategies for effective learning. *The Psychologist*, *26*(2), 120-123.

Couldry, N., & Mejias, U. A. (2023). The decolonial turn in data and technology research: What is at stake and where is it heading? *Information, Communication & Society*, *26*(4), 786–802. https://doi.org/10.1080/1369118X.2021.1986102

Curran, D., & Smart, A. (2021). Data-driven governance, smart urbanism and risk-class inequalities: Security and social credit in China. *Urban Studies*, *58*(3), 487–506. https://doi.org/10.1177/0042098020927855

Fukuda-Parr, S., & Gibbons, E. (2021). Emerging consensus on 'ethical AI': Human rights critique of stakeholder guidelines. *Global Policy*, *12*(S6), 32–44. https://doi.org/10.1111/1758-5899.12965

Hassan, Y. (2023). Governing algorithms from the South: A case study of AI development in Africa. *AI & Society*, *38*(4), 1429–1442. https://doi.org/10.1007/s00146-022-01527-7

Hodson, M., & McMeekin, A. (2021). Global technology companies and the politics of urban socio-technical imaginaries in the digital age: Processual proxies, Trojan horses and global beachheads. *Environment and Planning A: Economy and Space*, *53*(6), 1391–1411. https://doi.org/10.1177/0308518X211002194

Hsu, J. (2017). State transformation and the evolution of economic nationalism in the East Asian developmental state: The Taiwanese semiconductor industry as case study. *Transactions of the Institute of British Geographers*, *42*(2), 166–178. https://doi.org/10.1111/tran.12165

Hung, H. (2018). *Chinese state capitalism in Hong Kong*. In T-. K. Lui, S. W. K. Chiu, & R. Yep (Eds.) *Routledge Handbook of Contemporary Hong Kong* (pp. 430–447). Routledge.

Introna, L. D. (2016). Algorithms, Governance, and Governmentality: On governing academic writing. *Science, Technology, & Human Values*, *41*(1), 17–49. https://doi.org/10.1177/0162243915587360

Jasanoff, S., & Kim, S.-H. (2015). *Dreamscapes of modernity: Sociotechnical imaginaries and the fabrication of power*. University of Chicago Press.

Just, N., & Latzer, M. (2017). Governance by algorithms: Reality construction by algorithmic selection on the Internet. *Media, Culture & Society*, *39*(2), 238–258. https://doi.org/10.1177/0163443716643157

Kim, E.-S. (2018). Sociotechnical imaginaries and the globalization of converging technology policy: Technological developmentalism in South Korea. *Science as Culture*, *27*(2), 175–197. https://doi.org/10.1080/09505431.2017.1354844

Milan, S., & Treré, E. (2019). Big data from the South (s): Beyond data universalism. *Television & New Media*, *20*(4), 319-335.

Mohamed, S., Png, M.-T., & Isaac, W. (2020). Decolonial AI: Decolonial Theory as Sociotechnical Foresight in Artificial Intelligence. *Philosophy & Technology*, *33*(4), 659–684. https://doi.org/10.1007/s13347-020-00405-8

Mumford, D. (2022). Data colonialism: Compelling and useful, but whither epistemes? *Information, Communication & Society*, *25*(10), 1511–1516. https://doi.org/10.1080/1369118X.2021.1986103

Roberts, H., Cowls, J., Morley, J., Taddeo, M., Wang, V., & Floridi, L. (2021). The Chinese approach to artificial intelligence: An analysis of policy, ethics, and regulation. *AI & Society*, *36*(1), 59–77. https://doi.org/10.1007/s00146-020-00992-2

Sadowski, J., & Bendor, R. (2019). Selling smartness: corporate narratives and the smart city as a sociotechnical imaginary. *Science, Technology, & Human Values*, 44(3), 540–563. https://doi.org/10.1177/0162243918806061

Singh, R. (2023). The decolonial turn is on the road to contingency. *Information, Communication & Society*, *26*(4), 803–806. https://doi.org/10.1080/1369118X.2021.1986104

Sismondo, S. (2020). Sociotechnical imaginaries: An accidental themed issue. *Social Studies of Science*, *50*(4), 505–507. https://doi.org/10.1177/0306312720944753

Tan, K. P. (2012). The ideology of pragmatism: Neo-liberal globalisation and political authoritarianism in Singapore. *Journal of Contemporary Asia*, *42*(1), 67–92. https://doi.org/10.1080/00472336.2012.634644

Tidwell, A. S. D., & Smith, J. M. (2015). Morals, materials, and technoscience: The energy security imaginary in the United States. *Science, Technology, & Human Values*, *40*(5), 687–711. https://doi.org/10.1177/0162243915577632

Yeung, H. W. (2016*). Strategic coupling: East Asian industrial transformation in the new global economy*. Cornell University Press.

Appendix 1: Key events and tech policy document selection

	Year of release	Policy title / Event
Singapore	2024	Smart Nation 2.0
	2023	Singapore National AI Strategy 2.0
	2023	Digital Connectivity Blueprint
	2019	National AI Strategy
	2019	5G Innovation Program
	2015	Infocomm Media 2025
	2014	Smart Nation Initiative is launched
Hong Kong	2024	Policy Statement on the Responsible Application of AI in the Financial Market
	2024	Hong Kong AI Industry Development Study (issued by Hong Kong Productivity Council)
	2022	Hong Kong Innovation and Technology Development Blueprint
	2021	People's Republic of China (PRC) Five-year Plan
	2020	Smart City Blueprint 2.0
	2019	Greater Bay Area Outline Development Plan
	2017	Smart City Blueprint
Taiwan	2024	Asia Silicon Valley Development Plan 3.0
	2023	Taiwan Chip-based Industrial Innovation Program
	2023	AI Taiwan Action Plan 2.0 (2023-2026)
	2018	AI Taiwan Action Plan (2018-2021)
	2021	Asia Silicon Valley Development Plan 2.0
	2016	Asia Silicon Valley Development Plan 1.0 (2016-2020)