



**Selected Papers of #AoIR2021:
The 22nd Annual Conference of the
Association of Internet Researchers**
Virtual Event / 13-16 Oct 2021

ALGORITHMIC EMPOWERMENT OR IMPERIALIST WARFARE? DARK SKIN, AI CAMERA, AND A CHINESE COMPANY'S PATENT STRATEGY

Miao Lu
The Chinese University of Hong Kong

Jack Linchuan Qiu
National University of Singapore

Facial recognition technologies have spread quickly, including in the Global South. As a branch of artificial intelligence (AI), machine vision can resemble, reproduce, and amplify human prejudice, for example, HP webcam's failure to detect dark faces, and Google's auto-tagging of black people as "gorillas" (Benjamin, 2019). Meanwhile, predictive AI used in criminal justice is found to cause discriminatory policing and surveillance, which have deep roots in colonial identification (Browne, 2015; Mohamed, Png & Isaac, 2020).

What has prevented companies like Google from recognizing black faces accurately and equally? It may be because the datasets used to train algorithms are not diverse enough, in which minority groups are underrepresented or mislabeled. However, as Crawford and Paglen (2019) contend, automated interpretation of images is an inherently social and political project, especially when AI designers are overwhelmingly white and male.

However, the politics of AI is far from being settled. China, for example, has been challenging America's AI supremacy (Lee 2018). In 2019, China overtook the US in AI journal citations (Zhang, et al., 2021). This project focuses on patents as another key indicator, for which Shenzhen has become a front-runner where Chinese companies aggressively pursue patent applications (<https://bit.ly/32aJ8Np>). The Shenzhen-based Huawei, for example, filed 2,398 patents with the European Patent Office, topping its ranking list in 2017 (<https://bit.ly/2QIbL8e>).

This paper examines another Shenzhen-based company, Transsion, which is becoming a leading innovator in facial recognition technologies optimised for darker skins. In December 2020, Transsion received the Wu Wenjun AI Science & Technology Award,

Suggested Citation (APA): Lu, M. & Qiu, J.L. (2021, October). *Algorithmic Empowerment or Imperialist Warfare? Dark Skin, AI Camera, and a Chinese Company's Patent Strategy*. Paper presented at AoIR 2021: The 22nd Annual Conference of the Association of Internet Researchers. Virtual Event: AoIR. Retrieved from <http://spir.aoir.org>.

China's most important AI award, for its visual technologies for darker skin tones. Founded in 2006, Transsion is a phone manufacturer targeting emerging markets and currently the dominant player in Africa, outcompeting opponents like Samsung and Huawei (Hancock, 2017). Transsion's AI camera, optimized for darker skins, has long been the company's unique selling point.

- How and why does Transsion develop its facial recognition technologies for darker skin tones?
- How does the company articulate and interpret its patent strategy?
- What narratives does it use, and why?
- What are the technical, social-cultural, and geopolitical implications?

Viewing Transsion as a case of computing from the South (Amrute & Murillo, 2020), this study aims to explore the questions above by using two main methods. First, document analysis, including Transsion's patent documents, company reports, and prospectus. By searching "Transsion (Shenzhen)" and "facial recognition" on Google Patents, a search service from Google that indexes patents and patent applications from 17 major patent offices in the world, we retrieved 107 documents, including 104 granted by China's National Intellectual Property Administration (CNIPA), and four by World Intellectual Property Organization (WIPO). Since September 2019, Transsion has been publicly listed in the Shanghai Stock Exchange. Company reports and prospectus were collected through the official websites of Transsion and the Shanghai Stock Exchange, then analyzed along with the patent documents through NVIVO and textual analysis.

Second, participant observation. From July to October 2018, the lead author of this article worked as a special intern at Transsion's Shenzhen headquarters. Then she observed Transsion's operations in Ghana during September-December 2019. These experiences were valuable for observing the company's corporate culture and global strategy, although it should be noted that all the documents analyzed in this study are from the public domain.

We have identified two major narratives surrounding Transsion's facial recognition patent strategy. First is the "empowerment" narrative. Transsion argues that there are "blind spots" in conventional AI camera technologies; and that the needs of dark-skinned users are ignored by other smartphone makers. Three types of "blindness" in the AI camera industry have been articulated: (a) algorithmic blindness to black faces, (b) cultural blindness to the beauty of darker skins, and (c) market blindness to the African continent.

Based on this diagnostic positioning, Transsion interprets its AI camera as not just a fix to existing blindness but also an empowerment tool to dark-skinned users by "seeing" and capturing their beauty. Moreover, Transsion associates its patent and business strategies with China's "One Belt One Road" initiative and Chinese state discourse of win-win relationship with countries of the Global South. In so doing, Transsion aligns with the discourse of Chinese technologies as an alternative and superior option to

Western technologies for African users. In this sense, the machine vision for darker skins is gained not only through rebuilding the biased dataset and retraining racist algorithms but also through an appreciation of the beauty and needs of dark-skinned users. While motivated by critical and postcolonial considerations, this article argues that Transsion's patent discourse indeed carves out new space for the imagination of decolonial algorithms.

While the "empowerment" narrative is more externally oriented, Transsion tends to use a "warfare" narrative to interpret its patent strategy internally. This may have to do with cut-throat market competition, patents race (comparable to arms race), and the rapid pace of innovation in China, which gave Transsion a strong sense of crisis. Other major Chinese brands (e.g., Xiaomi) are also entering the African market. Transsion thus considers its facial recognition patents as "competitive weaponry" in preparation for a future clash in Africa's smartphone market. To develop these patent "weapons", Transsion not only gives strong incentives to its engineers for patent applications. It also keeps purchasing strategic patents from other companies. Viewing Africa as a battlefield, Transsion strategically collaborates with selected Chinese or Western partners, while viewing others (e.g., Huawei and Xiaomi) as competitors or even "enemies". We argue that such a strategy is shaped by Transsion's relative vulnerability in the global mobile phone industry. The "warfare" narrative highlights both the economic uncertainty in emerging markets such as Africa and the geopolitical uncertainty of AI industry in the future.

This study makes three contributions. Empirically, through document analysis and participant observation, we examine a relatively less known Chinese smartphone company that has made huge impact in the Global South. Theoretically, we shed on the possibility of algorithmic empowerment against racist facial recognition systems, although developing AI as a weaponry, in the Chinese-African contexts, may also lead to new forms of imperialism. Thematically, this study reveals the politics and geopolitics of independence through patents. However, Transsion's independence may deepen dependencies and uneven development elsewhere.

References

- Amrute, S., & Murillo, L. F. R. (2020). Introduction: Computing in/from the South. *Catalyst: Feminism, Theory, Technoscience*, 6(1), 1-23.
- Benjamin, R. (2019). *Race after technology: Abolitionist tools for the New Jim Code*. Polity Press.
- Browne, S. (2015). *Dark matters: On the surveillance of blackness*. Duke University Press.

Crawford, K. & Paglen, T. (2019). *Excavating AI: The politics of training sets for machine learning*. Retrieved from: <https://excavating.ai>.

Hancock, T. (2017, November 19). China's Transsion dominates African mobile phone market. *Financial Times*. Retrieved from: <https://www.ft.com/content/58c4fad8-c394-11e7-a1d2-6786f39ef675>.

Lee, K. F. (2018). *AI superpowers: China, Silicon Valley, and the new world order*. Houghton Mifflin Harcourt.

Mohamed, S., Png, M. T., & Isaac, W. (2020). Decolonial AI: Decolonial theory as sociotechnical foresight in artificial intelligence. *Philosophy & Technology*, 33(4), 659-684.

Zhang, et al. (2021). *The AI Index 2021 Annual Report*. Human-Centered AI Institute, Stanford University, Stanford, CA.