

Mainland China

Potential 2035 economic impact of the metaverse

US\$456-862_B per year

Mainland China

Mainland China’s deep technology and manufacturing verticals are shaping a metaverse with its own Chinese characteristics. The state wants the trajectory of metaverse developments to complement the real economy,¹ in line with President of the People’s Republic of China Xi Jinping’s declaration that “the real economy is the very foundation of an economy... and an important pillar of national prosperity”.²

Beijing has announced a two-year metaverse innovation and development plan (2022 – 2024) to develop the technological infrastructure and promote its use in various fields, including education and tourism.³ Shanghai included the metaverse in its 14th five-year plan, encouraging its application in areas such as public services, business, social entertainment and industrial manufacturing,⁴ and

is constructing the Zhangjiang metaverse-themed industrial park. Other provincial governments have also signaled their support, including Jiangsu, Zhejiang, Wuhan and Heifei.⁵

Homegrown technology giants are making metaverse investments through both acquisitions and research. Bytedance acquired VR headset company, Pico⁶ and virtual social platform, PoliQ.⁷ Alibaba has invested at least US\$1 billion in AR and VR startups in recent years.⁸ Baidu is developing the technological tools to enable developers and creators to create the metaverse through its XiRang platform.⁹ Huawei and Tencent joined hands with other companies to set up The Joint Research Institute of Metaverse and Virtual-Real Interaction with China’s premier universities, including Fudan University and Peking University.¹⁰

Ensuring that they stay on the right side of regulators, industry leaders like Tencent, Ant Group, Baidu and JD.com have joined an industry pledge to ensure digital collectible sales adhere to the ban on cryptocurrencies, requiring real-name authentication of buyers and sellers and reining in secondary marketplaces.¹¹

Domestic consumers are already embracing digital consumer store experiences, and livestreaming. Virtual influencers are set to be a key feature of China’s US\$171 billion live-commerce market, which grew at a compound annual growth rate (CAGR) of more than 280% between 2017 and 2020.¹² With the country’s vibrant entrepreneurial spirit, strong government support and direction, and the well-capitalized financial ecosystem in first-tier cities, China stands ready to take advantage of the plentiful opportunities that the metaverse economy will provide.

“Competition in the internet sector has come to a new stage, and we are going to embrace the fourth generation of the internet, which will be the age of the metaverse.”

Luo Jun, Secretary General of the Metaverse Committee of China Computer Industry Association

1. National Center for Science and Technology Innovation, “[Artificial Intelligence Can Harmonize and Accelerate the Development of the Real Economy](#),” September 5, 2022.
2. CPC Central Committee Bimonthly, Qiushi, “[Accelerate Economic Modernization](#),” accessed September 19, 2022.
3. Coco Feng, “[China’s World Metaverse Conference Kicks Off In Beijing In Display of National Ambition But Few Foreign Presenters](#),” South China Morning Post, August 26, 2022.
4. Shanghai Municipal People’s Government, “[Boosting the Development of Low-Carbon Industries and Artificial Intelligence Assisted Manufacturing, And Nurturing The Development Pathway Of The Metaverse](#),” accessed September 19, 2022.
5. Deloitte, [The Metaverse Overview: Vision, Technology and Tactics](#), 2022.
6. Arjun Kharpal, “[TikTok Owner ByteDance Takes First Step Into Virtual Reality With Latest Acquisition](#),” CNBC, August 30, 2021.

7. Jiaxing Li, “[ByteDance’s Metaverse Investments Continue With Acquisition of Chinese Virtual Social Platform PoliQ](#),” South China Morning Post, June 27, 2022.
8. Cissy Zhou, “[Alibaba Leads \\$60mil Funding Round for Smart Glasses Maker Nreal](#),” Asia Nikkei, March 30, 2022.
9. Nina Xiang, “[Baidu Wants Its XiRang Platform To Be The Enabler Of the Metaverse](#),” Forbes, May 12, 2022.
10. Pandaily, “[Huawei, Tencent and Others Build Joint Metaverse Research Institute](#),” accessed September 19, 2022.
11. Coco Feng “[China NFTs: Tencent and Ant Group Join Industry Pledge to Ban Cryptocurrency and Fight Speculation](#),” South China Morning Post, July 4, 2022.
12. McKinsey, [It’s Showtime! How Live Commerce Is Transforming the Shopping Experience](#), 2021.



Macroeconomic Determinants

- China's economy has a strong and growing service sector focus (50.9% of GVA). The largest sectoral contributor to its economy is manufacturing (29.3% of GVA), followed by wholesale and retail trade (9.5%), and financial and insurance activities (8.0%). These sectors have the potential to be impacted by metaverse technologies in the near term.
- Strong propensity for innovation in the metaverse, with China ranked 11th globally, based on the Global Innovation Index 2022.
- China is an upper-middle income country. Given its large population, there will be a wide range of ways that users will access the metaverse depending on factors such as income and age.
- The policy direction of metaverse-related strategies follows China's current industrial policy of technology independence and increased domestic consumption, as seen in the State Council's Next Generation Artificial Intelligence Development Plan (up to 2030).¹³
- While this may take time to materialize, the country's push for metaverse technologies to integrate with the "real economy"¹⁴ could see developments of more diverse use-cases that differ from other countries.

13. Ping West, "China Aims To Propel The Real Economy With a Virtual Economy – Metaverse," accessed September 19, 2022.
14. Department of International Cooperation Ministry of Science and Technology, "Next Generation Artificial Intelligence Development Plan," China Science & Technology, October 19, 2022.

MAINLAND CHINA IN NUMBERS

Potential 2035 economic impact of the metaverse:

US\$456-862B per year, 1.3-2.4% of GDP

2020 GDP:

US\$14.6T

Per capita
(Constant 2017 US\$):

US\$16,297
(upper middle income)

Key sectors:



ICT sector:

Population:

1.402B

61% urban

30% below 25

11% unbanked

Global innovation index:

#11/132

ElU business environment ranking:

#42/99

Digital readiness index:

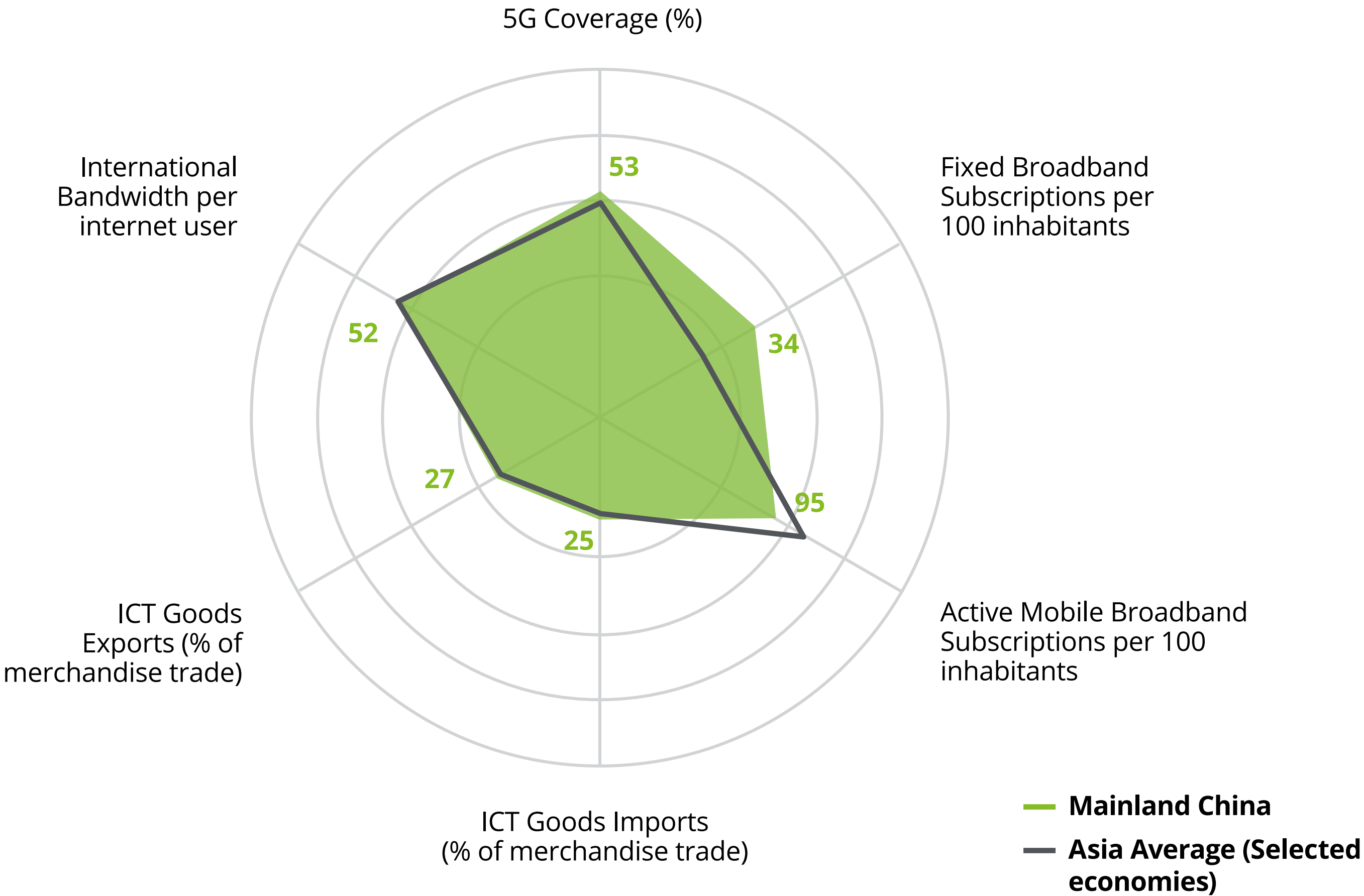
#54/141

Sources: World Bank World Development Indicators 2020, Our World in Data 2017, ITU Digital Development Dataset 2019, World Bank Global Findex, China National Statistics

Technology Fundamentals

- China's deep technology and manufacturing verticals provide it with the capability to shape a metaverse that has its own Chinese characteristics.
- The nation is building up its own technology independence across supply chains in key areas such as semiconductors,¹⁵ which are necessary to power devices that enable the metaverse. Being the world's largest market for the application of robotics,¹⁶ it has the capacity to further scale up the production of these devices.
- The central government is scaling up its domestic 5G network, targeting for the nation's 5G network to cover most villages by 2025.¹⁷ There are plans for commercialization of 6G technology around 2030.¹⁸ Speed and reliability of the service would have to be further improved¹⁹ to enable higher-fidelity immersive metaverse experiences.
- China is trending towards becoming a cashless society, with 90% of its people in urban areas and 82% in rural areas using digital payments.²⁰
- The Ministry of Human Resources and Social Security released a plan to increase digital skill education and training to the public to help more people reap the benefits of digital development.²¹

15. Tche-Jeng Wang, "China's Semiconductor Breakthrough," The Diplomat, August 20, 2022.
16. Global Times, "China's Robotics Sector Makes Breakthroughs, Closing In On That Of Advanced Countries," August 21, 2022.
17. The State Council, "China's 5G Network to Cover Most Villages By 2025," November 17, 2021.
18. Global Times China, "China Aims to Commercialize 6G By 2030: White Paper", accessed September 19, 2022.
19. Opensignal, "Benchmarking the Global 5G Experience", accessed September 19, 2022.
20. World Bank Blogs, "What Can Indonesia Learn From China's Digital Economic Transformation", accessed September 19, 2022.
21. Ministry of Human Resource and Social Security, "Issuing the Implementation Plan for 'Skills in China' Initiative", accessed September 19, 2022.



Sources: GSMA Mobile Connectivity Index 2021, ITU Digital Development Dashboard 2020, UNCTADStat 2019

Ecosystem Enablers

Competition within the metaverse

China has a complete metaverse value chain across hardware, software and content, which will incentivize competition across firms.²² Homegrown software giants like ByteDance, Alibaba and Baidu, are racing to be at the forefront of metaverse development. Some have taken steps to build hardware capabilities in the metaverse as the devices are the gateway to future development of the metaverse. Bytedance bought over VR headset company, Pico,²³ and Alibaba-led investment in AR glasses company, Nreal.²⁴ The firms have also further augmented their software capabilities through acquisition and internal development – ByteDance acquired virtual social platform, PoliQ,²⁵ and Baidu-developed XiRang platform wishes to provide the technological capabilities for creators to build up the metaverse.²⁶ Industry alliances are forming, such as the metaverse committee of the China Computer Industry Association, to help the industry join the “racetrack of the digital economy”.²⁷

On the content side, Multi-Channel Networks (MCNs) are fueling the rise of internet celebrities like Austin Li (better known as Li Jiaqi), a prominent male Key Opinion Leader with 45 million followers on Douyin, known as the “lipstick king”.²⁸ MCN firms are estimated to be behind 40% of all accounts with more than 10 million followers on China’s social media platforms.²⁹ Corporate firepower behind the livestreaming and creator market, coupled with AI-powered tools from the likes of Baidu’s XiRang, could help unlock even more interactive, personalized, and real-time experiences in the metaverse for China’s new generation of users.³⁰

Technology Readiness of Businesses

As China moves beyond cost competitiveness towards technological breakthroughs to power its next phase of growth, firms have ramped up R&D. From 2009 to 2019, gross R&D expenditures in the country rose threefold, to almost US\$515 billion, making China the world’s second largest R&D spender. This is supported by the central government, with stepped up targets for growth in R&D investments, patent ownership and value generated by the digital economy in the 14th five-year plan published earlier this year.³¹ In 2020 and 2021, Tencent and Baidu were amongst the leading companies in the world for VR and AR patent applications.³²

Huawei and Tencent have also joined hands with other companies to set up The Joint Research Institute of Metaverse and Virtual-Real Interaction with China’s premier universities, including Fudan and Peking.³³ Businesses are beginning to leverage upon the possibilities within the digital realm. Shoppers can seamlessly direct their digital avatars on their mobile phone within Taobao’s virtual mall during its 618 Shopping Festival.³⁴ Coupled with China’s robust start-up ecosystem, domestic breakthroughs in the implementation of metaverse technologies will emerge in the coming years.

22. Deloitte, [Metaverse report – Future is here](#), 2022.
23. CNBC, [“TikTok Owner ByteDance Takes First Step Into Virtual Reality With Latest Acquisition,”](#) August 30, 2021.
24. Asia Nikkei, [“Alibaba Leads \\$60mil Funding Round for Smart Glasses Maker Nreal,”](#) March 30, 2022.
25. Sijaxing Li, [“ByteDance’s Metaverse Investments Continue With Acquisition of Chinese Virtual Social Platform PoliQ,”](#) Asia Nikkei, June 27, 2022.
26. Nina Xiang, [“Baidu Wants Its XiRang Platform To Be The Enabler Of the Metaverse,”](#) Forbes, May 12, 2022.
27. Coco Feng, [“China’s State-Backed Metaverse Committee Aims To Help Industry Join The “Racetrack Of The Digital Economy,”](#) South China Morning Post, May 11, 2022.
28. Alice Huang, [“Who Is Millionaire Li Jiaqi, China’s “Lipstick King” Who Raised More Than US\\$145mil in Sales On Singles’ Day?”](#) South China Morning Post, March 9, 2020.
29. Reuters, [“China Says To More Closely Regulate Influencer Management Firms,”](#) accessed September 19, 2022.
30. McKinsey and Company, [“China’s Digital R&D Imperative,”](#) accessed September 19, 2022.
31. The State Council, The People’s Republic of China, [“Plan focuses on digital economy development during 14th Five-Year Plan period,”](#) press release, October 19, 2022.
32. Yvonne Lau, [“China’s Big Tech Leads In VR and AR Patent Applications, But China’s Metaverse May Look Different From Everyone Else’s,”](#) Fortune, January 28, 2022.
33. Pan Daily, [“Huawei, Tencent and Others Build Joint Metaverse Research Institute,”](#) accessed September 19, 2022.
34. PingWest, [“Alibaba Takes A Further Step Further into the Metaverse By Launching a New Shopping Venue,”](#) accessed September 19, 2022.

Sectors to Watch

Automobile

The metaverse is likely to make an impact in the automobile industry in three key areas – manufacturing, in-vehicle immersive experience and marketing.

BMW Group's Plant Lydia in Shenyang China is set to be one of the world's first plants designed in the metaverse, with the entire production process pre-planned through Epic Games' Unreal Engine 3D creation platform. The use of the platform shortened the construction time of the plant by six months.³⁵

As fully autonomous vehicle technology matures, vehicles could be transformed into mobile terminals with full in-vehicle immersive experiences. As a sign of further things to come, Chinese electric car company, NIO, is using AR glasses, produced in collaboration with Alibaba-backed NReal, an AR glasses start-up, to reduce the need for in-car screens.³⁶ In a bid to accelerate this transition, NIO is also funding ClearMotion's development of in-car 4D motion sensors that coordinate with the vehicle's infotainment system.³⁷

Engagement with consumers can be heightened through the metaverse. Baidu-backed JIDU unveiled its first robotic car, ROBO-01, on Baidu's XiRang platform.³⁸ The launch event was also livestreamed on the firm's WeChat video channel and Douyin. As metaverse technology matures, customers will likely be able to test-drive their vehicle within the metaverse on the day of any vehicle launch.

Healthcare

VR-based applications in healthcare training are being actively explored. Beijing University of Chinese Medicine students have used VR technologies to immerse in a three-dimensional human body marked with acupoints and meridian pathways as part of their acupuncture training.³⁹ The VR learning system has been touted to be an improvement on traditional acupuncture training based on two-dimensional images and the use of real people as models. Chinese haptic robotics startup, Intelligent Haptronic Solutions, is also developing VR-based digestive endoscopy simulators and training robots to enhance surgical training.⁴⁰ As training applications mature, this could pave the way for applications in actual healthcare settings. This might go some way in alleviating the shortage of doctors in ensuring quality care for its citizens.

35. BMW Group, "BMW Brilliance Plant Lydia Inaugurated: Digitalization Empowered Vehicle Plant Sets New Standards For Future-Oriented Vehicle Production," press release, June 23, 2022.

36. Evelyn Cheng, "Chinese Electric Car Start-Up Nio Reveals A New Sedan, Augmented Reality Glasses," CNBC, December 18, 2021.

37. Rita Liao, "Boston's ClearMotion Funded by NIO Capital To Switch On In-Car Metaverse in China," Tech Crunch, September 7, 2022.

38. Global Times, "Baidu-Backed JIDU Unveils ROBO-01, Its First Concept Robocar, Echoing Tesla's Model-Y," accessed September 19, 2022.

39. Nikkei Asia, "Chinese startup set on disrupting endoscopy simulator market", accessed September 19, 2022.

40. Elaine Yau, "Virtual reality helps Chinese medicine students learn acupuncture and doctors treat cancer," South China Morning Post, October 19, 2022.

