Jiayuan Chen（陈嘉源）

College of Computer Science and Technology,
Nanjing University of Aeronautics and Astronautics (NUAA)
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Website: https://www.jiayuanchen123.com
Date of Birth: 1997-11-24，Gender: Male
Native Place: Quanzhou, Fujian Province

Research Interests

Generative artificial intelligence, reinforcement learning, and their applications in resource management for communication networks. The targeted networks and applications include 3D/4D semantic communication, Internet of things (IoT), immersive communication, virtual-physical interaction, digital twin, and mobile edge computing (MEC).

Currently, I've published or had accepted 12 SCI-indexed journal articles (including 4 first-authored articles: 1 article in SCI Q1 and 2 articles in SCI Q2), 7 conference papers (including 3 first-authored: 2 papers in IEEE ICC (flagship conferences in communications), and 1 paper in IEEE INFOCOM Workshop), and obtained 2 patents (both as first inventor, with 1 authorized and 1 under review). Additionally, I've participated in 4 research projects (leading 1 independently and participating in 3 others).

Education

- **Ph.D.** in Computer Science and Technology (April 2023 - Present)
  Nanjing University of Aeronautics and Astronautics (NUAA)
  Advisor: Prof. Changyan Yi (Associate Director of the Department of Computer Science and Engineering, NUAA)
- **Master Degree** in Computer Science and Technology (Sept. 2020 - Mar. 2023)
  Nanjing University of Aeronautics and Astronautics (NUAA)
  Advisor: Prof. Changyan Yi (Associate Director of the Department of Computer Science and Engineering, NUAA)
- **Bachelor Degree** in Internet of Things Engineering (Sept. 2016 - Jun. 2020)
  Huaqiao University

Work Experience

- **Teaching Assistant**
  - Principles and Applications of Embedded Systems, NUAA
  - Optimization Theory and Its Applications, NUAA

Honors and Awards

- 2025 NUAA International Academic Exchange Program for Ph.D. Students, NUAA
- 2024 “Puxin Elite” Scholarship (10 recipients university-wide), Nanjing Pukou District Industry and Information Technology Bureau
- 2024 Outstanding Master Thesis Award, NUAA
- 2023 Best Presentation Award, A3 Foresight Program, NSFC, JSPS, NRF
- Outstanding Graduate Student (Class of 2023), NUAA
- 2021-2022 Merit Graduate Student, NUAA (2021-2022)
- 2020-2022 Outstanding Graduate Student Cadre, NUAA (consecutive two years)

Publications

Books/Chapters：

[1] Samuel D. Okegbile, Jun Cai, **Jiayuan Chen** and Changyan Yi,"Blockchain for Secure Data Sharing in Zero-Trust Human Digital Twin Systems," Blockchain and Digital Twin for Smart Hospitals, Elsevier press, 2025. (ISBN: 978-0-443-34226-4).

Journal Papers：

[1] Kun Wu, **Jiayuan Chen**, Lucheng Chen, Zili Liu, Changyan Yi, Shuai Xu, Junyi Wang and Jiawen Kang,"QoE-Aware Joint Visual and Haptic Signal Transmission with Adaptive Data Compression for Immersive Interactions in Human Digital Twin," IEEE Transactions on Network and Service Management, accepted. (SCI Q2, IF:4.7)

[2] Xiaolong Li, Ruiting Deng, Jianhao Wei, Xin Wu, **Jiayuan Chen**, Changyan Yi, Jun Cai, Dusit Niyato and Xuemin (Sherman) Shen,"AIGC-Driven Real-Time Interactive 4D Traffic Scene Generation in Vehicular Networks," IEEE Network, accepted. (SCI Q3, IF:6.8)

[3] Samuel D. Okegbile, Jun Cai, Junjie Wu, **Jiayuan Chen** and Changyan Yi,"A Prediction-Enhanced Physical-to-Virtual Twin Connectivity Framework for Human Digital Twin," IEEE Transactions on Cognitive Communications and Networking, accepted. (SCI Q1, IF:7.4)

[4] Hao Xiang, Changyan Yi, Kun Wu, **Jiayuan Chen**, Jun Cai, Dusit Niyato and Xuemin (Sherman) Shen,"Realizing Immersive Communications in Human Digital Twin by Edge Computing Empowered Tactile Internet: Visions and Case Study," IEEE Network, accepted. (SCI Q3, IF:6.8)

[5] Jialiuyuan Li, Changyan Yi, **Jiayuan Chen**, You Shi, Tong Zhang, Xiaolong Li, Ran Wang and Kun Zhu,"A Reinforcement Learning Based Stochastic Game for Energy-Efficient UAV Swarm Assisted MEC with Dynamic Clustering and Scheduling," IEEE Transactions on Green Communications and Networking, vol. 9, no. 1, pp. 255-270, Mar. 2025. (SCI Q2, IF:5.3)

[6] **Jiayuan Chen**, Changyan Yi, Hongyang Du, Dusit Niyato, Jiawen Kang, Jun Cai and Xuemin (Sherman) Shen,"A Revolution of Personalized Healthcare: Enabling Human Digital Twin with Mobile AIGC," IEEE Network, vol. 38, no. 6, pp. 234-242, Nov. 2024. (SCI Q3, IF:6.8)

[7] **Jiayuan Chen**, You Shi, Changyan Yi, Hongyang Du, Jiawen Kang and Dusit Niyato,"Generative AI-Driven Human Digital Twin in IoT-Healthcare: A Comprehensive Survey," IEEE Internet of Things Journal, vol. 11, no. 21, pp. 34749-34773, Nov. 2024. (SCI Q2, IF:8.2)

[8] Samuel D. Okegbile, Jun Cai, **Jiayuan Chen** and Changyan Yi,"A Reputation-Enhanced Shard-Based Byzantine Fault-Tolerant Scheme for Secure Data Sharing in Zero Trust Human Digital Twin Systems," IEEE Internet of Things Journal, vol. 11, no. 12, pp. 22726-22741, Jun. 2024. (SCI Q2, IF:8.2)

[9] **Jiayuan Chen**, Changyan Yi, Samuel D. Okegbile, Jun Cai and Xuemin (Sherman) Shen,"Networking Architecture and Key Supporting Technologies for Human Digital Twin in Personalized Healthcare: A Comprehensive Survey," IEEE Communications Surveys and Tutorials, vol. 26, no. 1, pp. 706-746, Firstquarter 2024. （**ESI Highly Cited Paper**）(SCI Q1, IF:34.4)

[10] Samuel D. Okegbile, Jun Cai, Hao Zheng, **Jiayuan Chen** and Changyan Yi,"Differentially Private Federated Multi-Task Learning Framework for Enhancing Human-to-Virtual Connectivity in Human Digital Twin," IEEE Journal on Selected Areas in Communications, vol. 41, no. 11, pp. 3533-3547, Nov. 2023. (SCI Q1, IF:13.8)

[11] Jialiuyuan Li, Changyan Yi, **Jiayuan Chen**, Kun Zhu and Jun Cai,"Joint Trajectory Planning, Application Placement and Energy Renewal for UAV-Assisted MEC: A Triple-Learner Based Approach," IEEE Internet of Things Journal, vol. 10, no. 15, pp. 13622-13636, Aug. 2023. (SCI Q2, IF:8.2)

[12] **Jiayuan Chen**, Changyan Yi, Ran Wang, Kun Zhu and Jun Cai,"Learning Aided Joint Sensor Activation and Mobile Charging Vehicle Scheduling for Energy-Efficient WRSN-Based Industrial IoT," IEEE Transactions on Vehicular

Technology, vol. 72, no. 4, pp. 5064-5078, Apr. 2023. (SCI Q2, IF:6.1)

Conference Papers：

[1] **Jiayuan Chen**, Yuxiang Li, Changyan Yi and Shimin Gong,"Generative AI-Aided QoE Maximization for RIS-Assisted Digital Twin Interaction," IEEE International Conference on Computer Communications Workshops (INFOCOM WKSHPS), London, United Kingdom, May 19-22, 2025.

[2] Yuxiang Li, **Jiayuan Chen** and Changyan Yi,"Distributionally Robust Optimization for Digital Twin Service Provisioning over Edge Computing," IEEE International Conference on Computer Communications Workshops (INFOCOM WKSHPS), London, United Kingdom, May 19-22, 2025.

[3] Kun Wu, **Jiayuan Chen**, Changyan Yi, Zili Liu, Xiaoping Lu, Junyi Wang and Jun Cai,"Joint Visual and Haptic Signal Transmission for Immersive Interactions in Human Digital Twin," International Conference on Ubiquitous Communication (UCOM), Xi'an, China, Jul. 5-7, 2024.

[4] Jialiuyuan Li, **Jiayuan Chen**, Changyan Yi, Tong Zhang, Kun Zhu and Jun Cai,"Energy-Efficient UAV Swarm Assisted MEC with Dynamic Clustering and Scheduling," IEEE Wireless Communications and Networking Conference (WCNC), Dubai, UAE, Apr. 21-24, 2024.

[5] Xiang Chen, Wenjie Zhu, **Jiayuan Chen**, Tong Zhang, Changyan Yi and Jun Cai,"Edge Computing Enabled Real-Time Video Analysis via Adaptive Spatial-Temporal Semantic Filtering," IEEE International Conference on Internet of Things (iThings), Ocean Flower Island, Hainan, China, Dec. 17-21, 2023.

[6] **Jiayuan Chen**, Changyan Yi, Jialiuyuan Li, Kun Zhu and Jun Cai,"A Triple Learner Based Energy Efficient Scheduling for Multi-UAV Assisted Mobile Edge Computing," IEEE International Conference on Communications (ICC), Rome, Italy, May 28-Jun. 1, 2023. (Flagship Conference)

[7] **Jiayuan Chen**, Changyan Yi, Ran Wang, Kun Zhu and Jun Cai," A Joint Optimization of Sensor Activation and Mobile Charging Scheduling in Industrial Wireless Rechargeable Sensor Networks," IEEE International Conference on Communications (ICC), Seoul, Korea, May 16-20, 2022. (Flagship Conference)

Patents：

[1] **Jiayuan Chen**, Changyan Yi, Ran Wang, Kun Zhu，"An Energy Optimization Approach for Industrial Wireless Rechargeable Sensor Networks", Patent No. ZL 2022 1 0355670.X (Authorized)

[2] **Jiayuan Chen**, Changyan Yi, Xiaolong Li，"A Digital Twin Interaction Experience Optimization Approach Based on Generative AI", Application No.: 202510413185.7 (Under Review)

Academic Activities

- TPC member:
  - The 5th International Conference on Image, Vision and Intelligent Systems (ICIVIS), 2025, (Workshop Chair)
- Reviewer:
  - IEEE Transactions on Mobile Computing
  - IEEE Transactions on Communications
  - IEEE Transactions on Wireless Communications
  - IEEE Transactions on Vehicular Technology
  - IEEE Internet of Things Journal
  - IEEE Systems Journal
  - IEEE Transactions on Dependable and Secure Computing
  - IEEE Network
  - IEEE Communications Magazine
  - IEEE Wireless Communications

- Cognitive Computation
- Behaviour & Information Technology
- International Journal of Data Science and Analytics
- Computers, Materials & Continua
- IEEE ICC, GLOBECOM, WCNC, VTC, etc.

Research Projects

- Intelligent Decision Optimization for Personalized Digital Twin Systems, Jiangsu Provincial Graduate Innovation Program, 2024.4-2025.5 **(Leader)**
- Dynamic Optimization of Manufacturing Resources for Large-Scale Personalization, Haier National Key Laboratory Project, 2023.8-2025.7 (Participant)
- Low-Latency High-Reliability Integrated Communication, Sensing, and Computation Technologies, NUAA Graduate Innovation Program, 2022.10-2023.10 (Participant)
- Resource Scheduling Schemes for Hierarchical and Heterogeneous Edge Computing Networks for Latency-Sensitive Applications, NSFC Youth Fund, 2021 (Participant)

Google Scholar

Citations: 347, h-index: 8, i10-index: 8