

Liuchao (Christopher) Jin



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🎓 Education

08/2022-Present Hong Kong, China	Chinese University of Hong Kong (CUHK), Doctor of Philosophy - Ph.D. Major : Mechanical and Automation Engineering Supervisor : Prof. Wei-Hsin Liao Research Direction : 3D/4D Printing, Smart Materials & Adaptive Structures, Soft Robotics. Award : Hong Kong PhD Fellowship Scheme (HKPFS)
09/2018-06/2022 Chengdu, China	Sichuan University - Pittsburgh Institute (SCUPI), Bachelor of Engineering - BE GPA : 4.0/4.0 Weighted Average Mark : 96.29/100 Major : Mechanical Engineering Ranking : 1/79

💻 Experiences

- 09/2025 - Present, California Institute of Technology (CalTech), Visiting Scholar.
Supervisor : Prof. Chiara Daraio. Program : CUHK Overseas Research Attachment Programme.
- 09/2025 - Present, AirWork Robotics Limited, CEO & Co-Founder.
- 09/2025 - Present, Harmonia Robotics Co., Ltd., Chief Scientist.
- 09/2025 - Present, The Chinese University of Hong Kong, MAE Department, Website Developer.
- 08/2024 - 10/2025, Shenzhen University, Visiting Scholar.
Supervisor : Prof. Shitong Fang and Zhihui Lai. Program : Shenzhen University Fellowship Program.
- 08/2023 - 09/2025, Southern University of Science and Technology (SUSTech), Visiting Scholar.
Supervisor : Prof. Qi Ge. Program : SUSTech Fellowship Program.
- 08/2022 - 07/2025, The Chinese University of Hong Kong, MAE Department, Teaching Assistant.
- 07/2021 - 08/2021, Westlake University, Research Assistant.
Supervisor : Prof. Weicheng Cui. Program : Westlake University Summer Graduate Research Internship.
- 06/2021 - 09/2021, McGill University, Research Assistant.
Supervisor : Prof. Abdolhamid Akbarzadeh Shafaroudi. Program : Mitacs Globalink Research Internship.
- 02/2020 - 06/2022, Sichuan University - Pittsburgh Institute, Teaching Assistant.

📖 Publications & Patents

- **Liuchao Jin**, Shouyi Yu, Jianxiang Cheng, Zhigang Liu, Kang Zhang, Sicong Zhou, Xiangnan He, Guoquan Xie, Mahdi Bodaghi, Qi Ge, Wei-Hsin Liao. (2025). Machine learning powered inverse design of strain fields of hierarchical architectures. *Composites Part B : Engineering*, 299, 112372.
- **Liuchao Jin**, Xiaoya Zhai, Wenbo Xue, Kang Zhang, Jingchao Jiang, Mahdi Bodaghi, Wei-Hsin Liao. (2025). Finite element analysis, machine learning, and digital twins for soft robots : State-of-arts and perspectives. *Smart Materials and Structures*, 34(3), 033002.
- **Liuchao Jin**, Kang Zhang, Sicong Zhou, Guoquan Xie, Wei-Hsin Liao. (2025). Modulus tunability in hierarchical architectures : A machine learning-enabled approach. In *Multifunctional Materials and Structures 2025*, 13433, 133-143. SPIE.
- Wenpeng Xu, Mengyu Zhang, Hao Xu, **Liuchao Jin***, Xiaoya Zhai*, Jingchao Jiang. (2025). INPR-connector : Interlocking negative Poisson's ratio connectors design for deployable energy absorption structures. *Composites Part B : Engineering*, 297, 112243.
- Wenpeng Xu, Ning Zhang, Hao Xu, **Liuchao Jin***, Jingchao Jiang*. (2025). Stress-guided lightweight design and optimization for 3D printing sacrificial molds. *Materials & Design*, 255, 114161.
- **Liuchao Jin**, Shouyi Yu, Jianxiang Cheng, Haitao Ye, Xiaoya Zhai, Jingchao Jiang, Kang Zhang, Bingcong Jian, Mahdi Bodaghi, Qi Ge, Wei-Hsin Liao. (2024). Machine learning-driven forward prediction and inverse design for 4D printed hierarchical architecture with arbitrary shapes. *Applied Materials Today*, 40, 102373.
- **Liuchao Jin**, Xiaoya Zhai, Jingchao Jiang, Kang Zhang, Wei-Hsin Liao. (2024). Optimizing stimuli-based 4D printed structures : A paradigm shift in programmable material response. In *Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems 2024*, 12949, 321-332. SPIE.
- **Liuchao Jin**, Xiaoya Zhai, Kang Zhang, Jingchao Jiang. (2024). Unlocking the potential of low-melting-point alloys integrated extrusion additive manufacturing : Insights into mechanical behavior, energy absorption, and electrical conductivity. *Progress in Additive Manufacturing*, 10(4), 2733-2745.
- **Liuchao Jin**, Xiaoya Zhai, Kang Zhang, Jingchao Jiang, Wei-Hsin Liao. (2024). 3D printing low-melting-point alloys integrated soft robots. *Materials Science in Additive Manufacturing*, 3(3), 4144. (Top Cited, Most Downloaded)

- › **Liuchao Jin**, Xiaoya Zhai, Kang Wang, Kang Zhang, Dazhong Wu, Aamer Nazir, Jingchao Jiang, Wei-Hsin Liao. (2024). Big data, machine learning, and digital twin assisted additive manufacturing : A review. *Materials & Design*, 244, 113086. (ESI Highly Cited Paper, Cover Paper, Top Cited, Top Downloaded)
- › **Liuchao Jin**, Xiaoya Zhai, Kang Zhang, Jingchao Jiang, Wei-Hsin Liao. (2024). Spider web-inspired additive manufacturing : Unleashing the potential of lightweight support structures. In *21st International Conference on Manufacturing Research*.
- › **Liuchao Jin**, Weicheng Cui. (2024). On technical issues for underwater charging of robotic fish schools using ocean renewable energy. *Ships and Offshore Structures*, 19(9), 1465-1475.
- › **Liuchao Jin**, Yuchen Lou, Lu-An Chen, Qi Lu. (2022). 6 Degree of freedom unified tracking controller for tilt-rotor multi-rotor unmanned aerial vehicles based on unit dual quaternion. In *2022 5th IEEE International Conference on Unmanned Systems (ICUS)*, 1356-1363. IEEE.
- › Haitao Ye, Chong Li, Shouyi Yu, Honggeng Li, Yiling Lian, Xiangnan He, Juzheng Chen, Xingjian Huang, **Liuchao Jin**, Jianxiang Cheng, Rong Wang, Lixi Huang, Biao Zhang, Xu Song, Yang Lu, Qi Ge. (2025). Adaptive Energy Dissipator with Compression-to-Tension Design. *Advanced Functional Materials*, e21393.
- › Wenbo Xue, **Liuchao Jin**, Bingcong Jian, Qi Ge. (2025). Origami-based flexible robotic grippers via hard-soft coupled multi-material 3D printing for soft robotics. *Soft Robotics*.
- › Kiandokht Mirasadi, M Amin Yousefi, **Liuchao Jin**, Davood Rahmatabadi, Majid Baniassadi, Wei-Hsin Liao, Mahdi Bodaghi, Mostafa Baghani. (2025). 4D printing of magnetically responsive shape memory polymers : Toward sustainable solutions in soft robotics, wearables, and biomedical devices. *Advanced Science*, e13091.
- › Siqian Wu, Rong Wang, **Liuchao Jin**, Xingjian Huang, Wuzhao Li, Kun Zhou, Qi Ge. (2025). Digital light processing 3D printing of large-scale and crack-free ceramics with perforated internal honeycomb structures. *Virtual and Physical Prototyping*, 20(1), e2589472.
- › Kang Zhang, Jingchao Jiang, **Liuchao Jin**, Qiang Gao, Xiaoya Zhai, Sicong Zhou, Zhenhong Li, Jifan Li and Wei-Hsin Liao. (2025). Low-melting-point alloy / polyurethane auxetic composite foam for outstanding impact protection with favorable shape memory effect. *Smart Materials and Structures*, 34(4), 045025.
- › Sicong Zhou, Kang Zhang, **Liuchao Jin**, Qiang Gao, Wei-Hsin Liao. (2025). Efficient data driven optimization framework for designing B-spline honeycombs with excellent energy absorption. *Thin-Walled Structures*, 209, 112941.
- › Wenbo Xue, Bingcong Jian, **Liuchao Jin**, Rong Wang, Qi Ge. (2025). Origami robots : Design, actuation, and 3D printing methods. *Advanced Materials Technologies*, e00278.
- › Changyue Liu, **Liuchao Jin**, Wei-Hsin Liao, Zhijian Wang, Qiguang He. (2025). Achieving rapid actuation in liquid crystal elastomers. *National Science Open*, 4(2), 20240013.
- › Ali Zolfagharian, **Liuchao Jin**, Qi Ge, Wei-Hsin Liao, Andrés Díaz Lantada, Francisco Franco Martínez, Tianyu Zhang, Tao Liu, Charlie C.L. Wang, Mohammad Hossein Mosallanejad, Reza Ghanavati, Abdollah Saboori, Alejandro De Blas-De Miguel, William Solórzano-Requejo, Yi Cai, Xiangyang Dong, Huangyi Qu, Najmeh Samadiani, Guangyan Huang, Austin Downey, Yanzhou Fu, Lang Yuan, Tsz-Kwan (Glory) Lee, Arbind Agrahari Baniya, Eisha Waseem, Abdul Rahman Sani, Abbas Z Kouzani, Yijia Wu, Markus P. Nemitz, Masoud Shirzad, Dageon Oh, Seung Yun Nam, Amedeo Franco Bonatti, Irene Chiesa, Gabriele Maria Fortunato, Giovanni Vozzi, Carmelo De Maria, Mahdi Bodaghi. (2025). Roadmap on Artificial Intelligence-Augmented Additive Manufacturing (AI2AM). *Advanced Intelligent Systems*.
- › Tielin Dai, **Liuchao Jin**, Chen Shang, Xiaoya Zhai, Xiao-Ming Fu, Ligang Liu. (2025). Advances in Intelligent Design of Metamaterials. *Journal of Computer-Aided Design & Computer Graphics*, 37(1), 1-27.
- › Linlin Wang, Jingchao Jiang, Yanyan Tian, Yicheng Dong, Haobing Li, **Liuchao Jin**, Voicu Ion Sucala. (2025). Prediction of process parameters based on stress-strain behaviour in 3D printing using deep neural network. In *2025 International Conference on Intelligent Digitization of Systems and Services (IDSS)*. IEEE.
- › Kang Zhang, Qiang Gao, Jingchao Jiang, Meishan Chan, Xiaoya Zhai, **Liuchao Jin**, Jiangfan Zhang, Jifan Li, Wei-Hsin Liao. (2024). High energy dissipation and self-healing auxetic foam by integrating shear thickening gel. *Composites Science and Technology*, 249, 110475.
- › Jingchao Jiang, Xiaoya Zhai, **Liuchao Jin**, Kang Zhang, Jun Chen, Qitao Lu, Wei-Hsin Liao. (2023). Design for reversed additive manufacturing low-melting-point alloys. *Journal of Engineering Design*, 36(10), 1617-1630.
- › Jingchao Jiang, Xiaoya Zhai, Kang Zhang, **Liuchao Jin**, Qitao Lu, Zhichao Shen, Wei-Hsin Liao. (2023). Low-melting-point alloys integrated extrusion additive manufacturing. *Additive Manufacturing*, 72, 103633.
- › Jingchao Jiang, **Liuchao Jin**, Xiaoya Zhai, Kang Zhang, Jun Chen, Wei-Hsin Liao. (2023). A novel strategy to fabricate low-melting-point alloy and its composite parts using extrusion additive manufacturing. In *The 50th International Conference on Computers and Industrial Engineering*.
- › Xiaoya Zhai, Yundong Gai, **Liuchao Jin**, Wei-Hsin Liao, Falai Chen, Ping Hu. (2023). Isogeometric topology optimization of auxetic materials based on moving morphable method. In *Materials Research Proceedings*, 31, 172-186.
- › Xiaoya Zhai, **Liuchao Jin**, Jingchao Jiang. (2022). A survey of additive manufacturing reviews. *Materials Science in Additive Manufacturing*, 1(4), 21. (Most Downloaded)
- › China Invention Grant Patent : Tracking Control Method for Tilt-Rotor Multi-Rotor UAV Based on Dual Quaternion. Patent number : ZL 2022 1 0739442.2.
- › China Utility Model Patent : Air Purification Device. Patent number : ZL 2021 2 2679101.4.

🎙 Conferences & Talks

- › 2025/10/30. GAMES Webinar 383 : Geometric Design and Intelligent Manufacturing (CAX Session). Online. (Invited Talk)
- › 2025/10/12–10/15. 2025 SES Annual Technical Meeting. Atlanta, Georgia, United States.

- › 2025/09/08–09/10. ASME's Premier Conference on Smart Materials, Adaptive Structures, and Intelligent Systems. St. Louis, Missouri, United States.
- › 2025/07/08–07/10. 4D Materials Design and Additive Manufacturing Conference. Singapore.
- › 2025/03/17–03/20. SPIE Smart Structures + NDE 2025. Vancouver, Canada.
- › 2025/01/06–01/10. 13th edition of the Global Young Scientists Summit (GYSS). Singapore.
- › 2024/09/25. SCUPI Alumni Sharing Session. Sichuan University-Pittsburgh Institute, Chengdu, China.
- › 2024/07/04–07/05. 4D Materials Design and Additive Manufacturing Conference 2024. Ajaccio, Corsica, France.
- › 2024/03/25–03/28. SPIE Smart Structures + NDE 2024. Long Beach, California, United States.
- › 2023/07/08. Seminar on Frontiers of Mathematics and Interdisciplinarity. University of Science and Technology of China, Hefei, China.
- › 2022/10/28–10/30. 2022 5th IEEE International Conference on Unmanned Systems. Guangzhou, China.

Honors & Awards

- 07/2025 Honorary Alumni Mentor of Sichuan University-Pittsburgh Institute
- 05/2025 CUHK PhD International Mobility for Partnerships and Collaborations Award (PhD IMPAC Award)
- 02/2025 Outstanding Students Award at The Chinese University of Hong Kong
- 11/2022 Outstanding Senior Project Award in Sichuan University
- 10/2022 Best Paper Award in 2022 IEEE International Conference on Unmanned Systems (ICUS)
- 06/2022 Outstanding Senior Project Award in Sichuan University-Pittsburgh Institute
- 05/2022 First Prize in The 7th National Academic English Vocabulary Competition (NAEV)
- 05/2022 Outstanding Senior Project Poster Award in Sichuan University-Pittsburgh Institute
- 03/2022 Outstanding Graduate of Sichuan Province
- 01/2022 A-level Certificate in Comprehensive Quality of University Students in Sichuan Province
- 12/2021 2020-2021 Academic Year National Scholarship (China) (¥8,000)
- 10/2021 Outstanding Graduate of Sichuan University
- 10/2021 2020-2021 Academic Year Outstanding Student of Sichuan University
- 10/2021 2020-2021 Academic Year Sichuan University-Pittsburgh Institute Best Academic Achiever Award (¥60,000)
- 09/2021 First Prize in Chinese Tale - English Talk
- 06/2021 Second Prize in Videos and Voices Short Video Contest
- 05/2021 Second Prize in The 6th National Academic English Vocabulary Competition (NAEV)
- 04/2021 Honorable Mention in 2021 Mathematical Contest in Modeling (MCM)
- 01/2021 Mitacs Globalink Research Internship Award
- 12/2020 2019-2020 Academic Year National Scholarship (China) (¥8,000)
- 10/2020 2019-2020 Academic Year Outstanding Student of Sichuan University
- 09/2020 Excellent Teaching Assistant Award for Sichuan University-Pittsburgh Institute
- 09/2020 2019-2020 Academic Year Sichuan University-Pittsburgh Institute Academic Star (¥10,000)
- 12/2019 2018-2019 Academic Year National Scholarship (China) (¥8,000)
- 10/2019 2018-2019 Academic Year Outstanding Student of Sichuan University
- 09/2019 2018-2019 Academic Year Sichuan University-Pittsburgh Institute Best Academic Achiever Award (¥60,000)
- 07/2019 First Prize in the Special Category of the 9th "Video Friends Cup" China University TV Awards
- 02/2019 Student Ambassador of Sichuan University-Pittsburgh Institute

Leadership & Extracurricular Activities

- › 06/2024 - Present, Sichuan University - Pittsburgh Institute Alumni Association, Alumni Mentor.
- › 09/2022 - 09/2023, The Postgraduate Halls Residents' Association, General Administrator.
- › 03/2022 - 03/2023, Mitacs Globalink, Ambassador.
- › 09/2019 - 09/2020, Sichuan University The 31st Student Congress, Representative.
- › 03/2019 - 06/2020, Sichuan University Student Television Station, Deputy Director.
- › 09/2018 - 06/2019, Sichuan University-Pittsburgh Institute Student Council, Member.

Community Contributions

- › 05/2021 & 11/2019, Chengdu Blood Center, Blood Donor.
- › 02/2021, UNESCO, Disaster Risk Management at UNESCO Designated Sites, Volunteer.
- › 07/2020-08/2020, GREENPEACE, Blue Planet Rescue Plan, Volunteer.
- › 02/2019, SCU – Return to Alma Mater, Social Practice of Winter Vacation, Participant.