Cornell University

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ACADEMIC APPOINTMENTS

Cornell University — Sep 2023–Present

- Ezra Systems Postdoctoral Associate — Systems Engineering
- Visiting Lecturer — Systems Engineering

EDUCATION

The University of Hong Kong — Sep 2019-Aug 2023

- Doctor of Philosophy — Industrial and Manufacturing Systems Engineering

Guangdong University of Technology — Sep 2016-Jul 2019

- Master of Engineering — Mechanical Engineering

Shenzhen University — Sep 2012-Jul 2016

- Bachelor of Engineering — Mechanical Design & Manufacturing and Their Automation

RESEARCH INTERESTS

- Blockchain Systems
- Trustworthy and Agentic AI
- Computational Optimization and Decision Analytics
- Supply Chain & Logistics, Sustainability Assessment

AWARDS & CERTIFICATES

Cornell University

- 2024 Associate Level Status, CIRTL Certificate Program

The University of Hong Kong

- 2019–2023 Postgraduate Scholarship
- 2023 HKU Conference Support Grant for Research Postgraduate Students
- 2022 Teaching Assistant Certificate

Guangdong University of Technology

- 2019 Outstanding Graduate Award
- 2018 National Competition “Challenge Cup”, Gold Medal
- 2018 Academic First Scholarship
- 2018 Outstanding Graduate Cadre
- 2017 Academic First Scholarship
- 2017 Outstanding Graduate Cadre
- 2017 Advanced Individual of Social Work

Shenzhen University

- 2015–2016 National Inspirational Scholarship
- 2014–2015 Academic Honors Second Prize
- 2014 Innovation and Entrepreneurship Training Project “Excellence Award”
- 2013–2014 Academic Honors Second Prize
- 2013 National Grants
- Outstanding Member, Volunteer Assistant Branch

REPRESENTATIVE PUBLICATIONS

Peer-Reviewed Journal Articles (Published / Accepted)

1. **Liu, X.**, Bagchi, T., Sy, C.L., Gao, H.O. (2026). A Blockchain-based Carbon Registry Platform for Credible Climate Action in Transportation. npj Climate Action, 5(1), 23.
2. Ruan, S., Liu, X., Gao, H.O. (2026). Blockchain-based carbon informatics for multiple stakeholders using spatial-temporal analytics. Environmental Modelling & Software, 106861.

3. Harish, A.R., **Liu, X.**, Wang, X., Pan, S., Dai, H.-N., Li, M., Huang, G.Q. (2025). Blockchain for Logistics 4.0: A Systematic Review and Prospects. Transportation Research Part E: Logistics and Transportation Review, 201, 104269.
4. Harish, A.R., **Liu, X.**, Li, M., Zhong, R.Y., Huang, G.Q. (2025). The new supply chain information sharing renaissance through crypto valuation mechanism of digital assets. Transportation Research Part E: Logistics and Transportation Review, 195, 103962.
5. **Liu, X.**, Liang, W., Fu, Y., Huang, G.Q. (2024). Dual Environmental, Social, and Governance (ESG) Index for Corporate Sustainability Assessment Using Blockchain Technology. Sustainability, 16(10), 4272.
6. **Liu, X.**, Jiang, Y., Wang, Z., Zhong, R.Y., Cheung, H.H., Huang, G.Q. (2023). imseStudio: blockchain-enabled secure digital twin platform for service manufacturing. International Journal of Production Research, 61(12), 3984-4003.
7. Harish, A.R., **Liu, X.**, Li, M., Zhong, R.Y., Huang, G.Q. (2023). Blockchain-enabled digital assets tokenization for cyber-physical traceability in E-commerce logistics financing. Computers in Industry, 150, 103956.
8. **Liu, X.**, Yang, Y., Jiang, Y., Fu, Y., Zhong, R.Y., Li, M., Huang, G.Q. (2023). Data-driven ESG assessment for blockchain services: A comparative study in textiles and apparel industry. Resources, Conservation and Recycling, 190, 106837.
9. **Liu, X.**, Barenji, A.V., Li, Z., Montreuil, B., Huang, G.Q. (2021). Blockchain-based smart tracking and tracing platform for drug supply chain. Computers & Industrial Engineering, 161, 107669.
10. **Liu, X**., Wang, W., Guo, H., Vatankhah Barenji, A., Li, Z., Huang, G.Q. (2020). Industrial blockchain based framework for product lifecycle management in industry 4.0. Robotics and Computer-Integrated Manufacturing, 63, 101897.

Manuscripts Under Review / Revision

11. **Liu, X.**, Bagchi, T., Harish, A.R., Sy, C.L., Gao, H.O. (2025). Blockchain and Double Auction for Credible and Efficient Voluntary Carbon Market. Applied Energy, under second review. http://dx.doi.org/10.2139/ssrn.5531640
12. **Liu, X.**, Pabolu, P., Jiang, Y., Fraser, T., Chen, R., Gao, H.O. (2025). SMARAG: An AI-powered Carbon Reporting System using Self-decisive Multi-Agent Retrieval-Augmented Generation. Expert Systems with Applications, under review. http://dx.doi.org/10.2139/ssrn.5586584
13. **Liu, X.**, Fu, Y., Zhang, M., Chen, W., Harish, A.R., Shan, T.B., Zhong, R.Y., Huang, G.Q. (2025). BESG: A Blockchain 5.0-based ESG Reporting Platform using Generative Artificial Intelligence. Humanities and Social Sciences Communications, minor revision (under second review).

In Preparation

Additional manuscripts are in preparation on topics including blockchain systems, trustworthy AI models, and optimization analytics for battery circularity and global climate innovation assessment.

Conference Talks & Invited Presentations

1. **Liu, X.** (2025). Emissions Tracking, Reporting, and Compliance Conference. 2025 Emissions Tracking, Reporting, and Compliance Conference, Houston, USA.
2. **Liu, X.** (2021). Blockchain-enabled ESG reporting framework for sustainable supply chain. Sustainable Design and Manufacturing 2020, Split, Croatia (Virtual).
3. Li, Z., **Liu, L.**, Wang, W. (2017). Simulated Annealing Algorithm-Based IMMK System for Mould Redesign. Transdisciplinary Engineering: A Paradigm Shift (pp. 889-897). IOS Press.

Poster and Oral Presentations

4. **Liu, X.**, Bagchi, T., Sy, C.L., Gao, H.O. (2025). A Double Auction Mechanism for Token-based Carbon Credit Trading in Blockchain-based Carbon Market. IISE Annual Conference and Expo 2025, Atlanta, USA. (Poster and oral presentation)
5. **Liu, X.**, Fu, Y., Huang, G.Q. (2023). Data-driven Dual ESG Index Using Random Forest Regression. 2023 International Conference on Resource Sustainability (icRS 2023), Guildford, Surrey, United Kingdom. (Poster and oral presentation)
6. **Liu, X.**, Jiang, Y., Huang, G.Q. (2022). Blockchain-based 3D Printing Cloud Platform for Service Manufacturing. 2022 Asia Pacific Industrial Engineering & Management Systems Conference, Taichung, Taiwan. (Poster and oral presentation)

INTELLECTUAL PROPERTIES

Invention patents:

1. Li, Z., **Liu, X.**, Zhang, J., Zhang, F., and Guo, H. A mold redesign data and knowledge matching method, device, and system based on simulated annealing algorithm. Chinese invention patents, CN108388676A, publication date: Aug 10th, 2018.
2. Li, Z., **Liu, X.**, Chen, X., Zhang, J., and Shen, Y. Blockchain-based manufacturing information interactive

system in mold industry. Chinese invention patents, CN108346110A, publication date: Jul 31st, 2018.

Software copyright:

1. Toward open manufacturing: blockchain-based 3D printing service system V1.0 (issued in May 2022)
2. Blockchain-based dual ESG index system V1.0 (issued in May 2022)
3. Blockchain-based drug traceability system V1.0 (issued in Aug. 2018)
4. IoT-based prepackaged food anti-expired software V1.0 (issued in Apr 2017)
5. IoT-based cosmetics anti-fake system software V1.0 (issued in May 2017)

RESEARCH & WORKING EXPERIENCES

- Project Manager, Towards Battery Circularity: Blockchain-enabled traceability and incentive design for EV battery recycling. EDF & Cornell Atkinson Center for Sustainability, 2026 joint proposal (under review).
- Project Leader, Agentic AI System for Carbon Reporting (SMARAG), Cornell University, Systems Engineering, Jan 2024–Present. Led a team of five graduate students; developed and deployed with Cornell Sustainability Office (smarag.cee.cornell.edu).
- Project Leader, Blockchain-based Carbon Market for Credible Climate Action, Cornell University, Systems Engineering, Jun 2024–Present.
- Core Project Member, nD Blockchain for ESG Reporting, Innovation and Technology Support Program (ITP/021/20LP), Innovation and Technology Fund (Hong Kong), Jan 2020–Jun 2023.
- Project Manager, imseStudio: Blockchain-enabled Secure Digital Twin Platform for Service Manufacturing, IMSE Department Project, May 2020–Apr 2021.
- Product Consultant, Shenzhen Qianhai Wearclass Technology Co., Ltd., Apr 2017–May 2017.
- Project Member, Research on Multi-Scale Tool Knowledge Discovery and Reuse Method Based on Rough Concept Lattice Theory, National Natural Science Foundation of China (NSFC), Sep 2016–Aug 2017.

TEACHING EXPERIENCES

- Course Instructor, **Industrial Blockchain Systems and Applications**, Cornell University, Sep 2023–Present. Supported by Boeing Gift Funding; covers cryptography/consensus, major platforms (Bitcoin, Ethereum, Hyperledger Fabric), and applications in supply chain and sustainability. Themes: 2025 "Blockchain: A Trustworthy Friend in the Era of AI"; 2024 "Blockchain for Social Benefits".
- Project Course Instructor, **Blockchain and Trustworthy AI Projects for Climate Action Research**, Cornell University, Jan 2024–Present. Guided 50+ master's students in computer science and systems engineering on project-based research and prototyping.
- Assistant Instructor, MSc (Eng) Capstone (Dissertation), IMSE, The University of Hong Kong, 2020–2021. Supervised capstone projects on (i) **IoT-based ESG data collection and configuration**, (ii) **mobile-app-enabled data collection for blockchain-based ESG platforms**, (iii) **blockchain-enabled collaborative manufacturing** (e.g., 3D printing), and (iv) **versioning smart contract-enabled planning and scheduling in smart manufacturing**.
- Teaching Assistant, **IMSE4135 Systems Integration**, IMSE, The University of Hong Kong, Sep 2020–Feb 2021. Taught two groups of undergraduate students (10 students per group) on developing blockchain-based systems for field applications (e.g., construction, 3D printing).
- Prepared to teach: Agentic AI Systems; Computational Optimization and Decision Analytics; Systems Engineering for Sustainability.

ACADEMIC SERVICES

- Member, IISE (Institute of Industrial and Systems Engineers)
- *Conference Organizer for the International Conference on Automation Science and Engineering (CASE 2020), Hong Kong, China.*
- Journal Reviewer for:
  - Resources, Conservation & Recycling
  - *International Journal of Production Economics*
  - *Scientific Reports*
  - *Technological Forecasting and Social Change*
  - *Computers & Industrial Engineering*

- *International Journal of Production Research*
- *Robotics and Computer-Integrated Manufacturing*
- *International Journal of Computer-Integrated Manufacturing*