Lei Huang

6250 Applied Science Lane, Vancouver, BC V6T 1Z4, CANADA
(646)283-1299 • lei.huang@ubc.ca

Education

Columbia University — **New York, NY, US**
Ph.D. in Civil Engineering — *Expected 2024.8 –*
Advisor: Zhengbo Zou

University of British Columbia (Transferred) — **Vancouver, BC, CA**
Ph.D. in Civil Engineering, GPA: 4.15/4.33 — *2021 – 2024.7*
Advisor: Zhengbo Zou

Columbia University — **New York, NY, US**
M.Sc. in Civil Engineering, GPA: 3.83/4.0 — *2018 – 2020*
CS@CU Bridge in Computer Science, GPA: 4.22/4.0

Central South University — **Changsha, CN**
B.E. in Civil Engineering, GPA: 3.4/4.0 — *2013 – 2017*

Publication

Refereed Journal Articles

1. **Huang, L.**, Cai, W., Zhu, Z., & Zou, Z. (2023). Dexterous manipulation of construction tools using anthropomorphic robotic hand. *Automation in Construction, 156*, 105133.
2. Cai, W., **Huang, L.**, & Zou, Z. (2023). Actively-exploring thermography-enabled autonomous robotic system for detecting and registering HVAC thermal leaks, *Automation in Construction, 152*, 104901.
3. **Huang, L.**, Zhu, Z., & Zou, Z. (2023). To imitate or not to imitate: Boosting reinforcement learning-based construction robotic control for long-horizon tasks using virtual demonstrations, *Automation in Construction, 146*, 104691.
4. Duan, K., Cao, S., Zou, Z., **Huang, L.**, & He, Z.(2022). Revealing the Nature of Concrete Materials Using Soft Computing Models, *Journal of Building Engineering, 59*, 105148.

Refereed Conference Articles

1. Cai, W., **Huang, L.**, & Zou, Z. (2023). RoboAuditor: Goal-Oriented Robotic System for Assessing Energy-intensive Indoor Appliance via Visual Language Models. In *Proceedings of the 10th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation* (pp. 130-139). Nov. 15-16, Istanbul, Turkey.
2. Cai, W., Zhang, L., **Huang, L.**, Yu, X., & Zou, Z. (2022). TEA-bot: A Thermography Enabled Autonomous Robot for Detecting Thermal Leaks of HVAC Systems in Ceilings. In *Proceedings of the 9th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation* (pp. 30-39). Nov. 9-10, Boston, MA.
3. **Huang, L.** & Zou, Z. (2022). Accelerating Training of Reinforcement Learning-Based Construction Robots in Simulation Using Demonstrations Collected in Virtual Reality. In *Association for Computing Machinery (ACM) Winter Simulation Conference* (pp. 2451-2462). IEEE. Dec. 11-14, Marina Bay Sands, Singapore.
4. **Huang, L.** & Zou, Z. (2022). Deep Reinforcement Learning-Based Construction Robots Collaboration for Sequential Tasks, *IEEE International Conference on Robotics and Automation (ICRA) Workshop on Future of Construction: Build Faster, Better, Safer - Together with Robots*. May. 23-27, Philadelphia, PA.
5. **Huang, L.**, Cai, W., & Zou, Z. (2022). Virtual Reality-Based Expert Demonstrations for Training Construction Robots via Imitation Learning, *Canadian Society for Civil Engineering (CSCE) Annual*

Conference. May 25-28, Whistler, BC, Canada. (**Best Student Paper Award**).

6. Cai, W., **Huang, L.**, & Zou, Z. (2022). An Integrated Approach Combining Virtual Environments and Reinforcement Learning to Train Construction Robots for Conducting Tasks Under Uncertainties, *Canadian Society for Civil Engineering* (*CSCE*) *Annual Conference*. May 25-28, Whistler, BC, Canada.
7. Zhang, H., **Huang, L.**, Cai, W., & Zou, Z. (2022). Semantic Segmentation of Synthetic Images into Building Components for Automated Quality Assurance, *Canadian Society for Civil Engineering* (*CSCE*) *Annual Conference*. May 25-28, Whistler, BC, Canada.

Book Chapters

1. Cai, W., **Huang, L.**, & Zou, Z. (2023). Reinforcement Learning-Based Robotic Motion Planning for Conducting Multiple Tasks in Virtual Construction Environments. In *Automation in Construction toward Resilience: Robotics, Smart Materials, and Intelligent Systems* (pp. 43-56). CRC Press.
2. Zhang, H., **Huang, L.**, Cai, W., & Zou, Z. (2023). Towards Automated Quality Assurance: Generating Synthetic Images of Building Components for Vision-Based Semantic Segmentation. In *Automation in Construction toward Resilience: Robotics, Smart Materials, and Intelligent Systems* (pp. 139-156). CRC Press.

Teaching Experience

Teaching Assistant, University of British Columbia

CIVL 300 Construction Engineering and Management	Spring 2023
CIVL 498A Machine Learning in Construction Management	Fall 2023
CIVL 520 Construction Planning and Control	Fall 2022, Fall 2023

Teaching Assistant, Columbia University

COMS W1004 Computer Science and Programming in Java	Fall 2020, Spring 2021

Industrial Experience

China Construction Eighth Engineering Division. Corp. LTD — **Hangzhou, ZJ, CN**
BIM Engineer and Technical Engineer — *2017.7 – 2018.1*

- Won the first prize in Building Information Modeling Competition (Ranked 2nd out of over 300)
- Built BIM in Revit in biddings of Art Museum of Shanghai Pudong, Jinhua People's Hospital

Sinohydro Engineering Bureau Eight Co. LTD — **Changsha, HN, CN**
Civil Engineer Intern — *2016.6 - 2016.8*

- Supervised 36 construction workers and made records to control construction quality
- Examined perpendicularity and flatness of walls in two buildings to ensure that the qualities comply with regulatory standards

Selected Awards and Honours

Faculty of Applied Science Graduate Award (Third-year CIV-EX), UBC	2023
J K Zee Memorial Fellowship, UBC	2022
Best Student Paper Award (General Track), Canadian Society for Civil Engineering	2022
President's Academic Excellence Initiative PhD Award, UBC	2021
International Tuition Award, UBC	2021
CS@CU Bridge Scholarship, Columbia University	2020
Global Leaders in Construction Management, Columbia University	2019
Outstanding Undergraduate Thesis, CSU	2017
Undergraduate Scholarship Award, CSU	2014

Professional Service

- **Conference Reviewer** (year in parentheses): ISARC 2024, CRC 2024, i3CE 2023, i3CE 2024.