Lei Huang

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Education

University of British Columbia — **Vancouver, BC, CA**
Ph.D. in Civil Engineering, GPA: 88% (4.09/4.33) — *2021 – present*
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, HN, CN**
B.E. in Civil Engineering, GPA: 3.4/4.0 — *2013 – 2017*

Publication

1. **Lei Huang**, Zhengbo Zou. **Accelerating Training of Reinforcement Learning-Based Construction Robots in Simulation Using Demonstrations Collected in Virtual Reality**, *IEEE Winter Simulation Conference (WSC)*, 2022.
2. **Lei Huang**, Zhengbo Zou. **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*, 2022.
3. **Lei Huang**, Weijia Cai, Zhengbo Zou. **Virtual Reality-Based Expert Demonstrations for Training Construction Robots via Imitation Learning**, *Canadian Society for Civil Engineering (CSCE) Annual Conference*, 2022. (**Best Student Paper Award**).
4. Weijia Cai, **Lei Huang**, Zhengbo Zou. **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*, 2022.
5. Hao Xuan Zhang, **Lei Huang**, Weijia Cai, Zhengbo Zou. **Semantic Segmentation of Synthetic Images into Building Components for Automated Quality Assurance**, *Canadian Society for Civil Engineering (CSCE) Annual Conference*, 2022.

Academic Experience

Vision-based Markerless Pose Estimation of Construction Equipment, Rutgers University 2021
- Conducted comprehensive literature review of pose estimations
- Proposed models to estimate poses of construction equipment in RGB images

AI City Challenge - Vehicle Counts by Class at Multiple Intersections, New York University 2020
- Applied CornerNet and CenterNet to do video-based-detections
- Developed algorithms to track vehicles in the region of interest

New York City's Bike Collision Patterns, Columbia University 2019
- Cleaned, pre-processed, and visualized large datasets using Pandas, Geopy, and Gmplot
- Evaluated the correlation between counts of bike collisions and weather conditions
- Predicted the number of cyclist-involved collisions by total bike trips using regression

Seismic Behavior of Steel-Concrete Composite Frame Structures, Central South University 2017
- Analyzed constitutive relation for plastic hardening of steel under monotonic loading, plastic damage

of concrete and hybrid model under cyclic loading
- Designed composite frame structure models in Abaqus and optimized the simulation time by 60%
- Collected and visualized the elastic-plastic seismic time-history data of models to study behaviors

Teaching Experience

Teaching Assistant, Columbia University
COMSW1004 Computer Science and Programming in Java — Fall 2020, Spring 2021
- Held weekly office hours and review sessions
- Graded assignments and coding projects

Professional 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

J K Zee Memorial Fellowship	2022
President's Academic Excellence Initiative PhD Award	2021, 2022
International Tuition Award	2021, 2022
Graduate Research Assistantship	2021
CS@CU Bridge Scholarship	2020
Global Leaders in Construction Management	2019
Best Thesis Honor	2017
Undergraduate Scholarship Award	2014

Technical Skills

Programming: Java, Python, Matlab, HTML, LaTeX
Software: AutoCAD, Abaqus, Autodesk Revit, Adobe Photoshop
Language: Mandarin (Native), English (Proficient), Spanish (Elementary)