

# LECHEN ZHANG

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## EDUCATION

### Columbia University

Master of Science in Mechanical Engineering (Robotics and Control Concentration)

New York, NY  
Expected Dec 2024

- **Advisor:** Prof. [Hod Lipson](#)

### University of Nottingham, Ningbo

Bachelor of Engineering with Honours in Mechanical Engineering

Ningbo, CN  
Jul 2022

- **Honors:** Dean's Scholarship in Academic Year 2018/2019
- **Advisor:** Prof. [Adam Rushworth](#)

## PUBLICATION

- Lin, J., **Zhang, L.**, Lee, K., Ning, J., Goldfeder, J., & Lipson, H. (2024). [AutoURDF](#): Unsupervised Robot Modeling from Point Cloud Frames Using Cluster Registration. *arXiv preprint arXiv:2412.05507*. **CVPR 2025 Accepted**
- Zhou, H., Guo, Z., Ren, Y., Liu, S., **Zhang, L.**, Zhang, K., & Li, M. (2024). [MoD-SLAM](#): Monocular Dense Mapping for Unbounded 3D Scene Reconstruction. *IEEE Robotics and Automation Letters*.
- **Zhang, L.** (2024). CUDA-Accelerated Soft Robot Neural Evolution with Large Language Model Supervision. *arXiv preprint arXiv:2405.00698*. (Technical Spotlight Oral at ICRA 2024 [Workshop on Co-design in Robotics](#))

## WORK EXPERIENCE

### Xiong'an Institute of Innovation, Chinese Academy of Sciences

Research Fellow (Full-time) Supervised by Prof. [Wuling Huang](#)

Xiong'an New Area, CN  
Jul 2022 – Jul 2023

- Developed and deployed a novel deep learning network for automated bird's-eye view map reconstruction from sparse roadside sensor data, reducing map generation time by 80% compared to traditional manual drone-based surveying methods
- Designed a novel monocular pose-free pipeline to train Neural Radiance Fields for large-scale scene digital twin reconstruction
- Led industry collaborative project with HAOMO.AI to develop an autonomous road inspection system, integrating multi-modal perception with deep learning-based defect detection algorithms for real-time road condition monitoring

## RESEARCH EXPERIENCE

### Self-Supervised Articulated Kinematics Discovery from 4D Point Cloud (AutoURDF)

Advisor: Prof. Hod Lipson, Columbia University

New York, NY  
Jan 2024 – Dec 2024

- Learning complex high degrees of freedom kinematics (up to 18) of robots and objects from the unlabeled point cloud sequence
- Designed novel rigid cluster representation for efficient training on dense 4D point cloud, achieving 20x speedup and 2x accuracy improvement over CVPR SOTA. Paper under review at CVPR 2025

### RoboBIM: Autonomous BIM Model Reconstruction System (Bachelor Thesis Project with \$15000 founding)

Advisor: Prof. Adam Rushworth, University of Nottingham, Ningbo

Ningbo, CN  
Jun 2021 – Jul 2022

- Designed and prototyped a novel autonomous mobile robot system for Building Information Modeling (BIM)
- Built modular hardware stack with multi-modal sensors, Jetson Xavier AGX computing unit, and robust power & signal system
- Built a complete ROS-based software stack, including URDF design, low-level control, Gazebo simulation, LiDAR-based localization, mapping, and path planning. Achieving centimeter-level reconstruction accuracy

## TECHNICAL SKILLS

**Programming:** Python, C++, CUDA, Matlab

**Robotics Middleware:** ROS, ROS 2, CyperRT

**Simulation:** Gazebo, Carla, Unreal Engine, PyBullet, MuJoCo

**Deep Learning:** PyTorch, Tensorflow, Keras

**CAD:** Solidworks, AutoCAD, Fusion360

**FEA & CFD:** Abaqus, Ansys

**Prototype:** FDM 3D Printing, Laser Cutting, CNC

**Computer Vision:** OpenCV, PCL, Open3D