

Jiuyi (Joey) Xu

Updated June, 1st, 2026

Colorado School of Mines
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EDUCATION

Ph.D. Robotics, Colorado School of Mines, Golden, CO	08/2024 - Present
- Research Interest: Vision-Language-Action (VLA) Models, Efficient AI - Advisor: Dr. Yangming Shi	
M.S. Computer Science, University of Southern California, Los Angeles, CA	08/2022 - 05/2024
B.E. Software Engineering, Dalian University of Technology, Dalian, China	09/2017 - 06/2021

RESEARCH EXPERIENCE

Yangming Research Group, Colorado School of Mines	Golden, CO
Graduate Research Assistant, Advisor: Dr. Yangming Shi	08/2024 - Present
- Conduct research in efficient vision-language-action models. - Conduct research in the application of generative AI across the field of civil engineering.	
Geospatial Terrain Research Team, USC Institute for Creative Technologies	Los Angeles, CA
Research Assistant Student Intern, Advisor: Dr. Meida Chen	06/2023 - 06/2024
- Conducted research in 3D semantic segmentation and 3D photogrammetric point cloud data processing: a) Automated Annotation in Indoor/Outdoor Environment Developed a framework to annotate both source and synthetic images automatically via Open-Vocabulary Object Detection (OVOD) and semantic segmentation to solve the limited availability of publicly accessible datasets in civil and construction environments. b) Tripping Hazard Detection in Construction Site Proposed a framework to detect tripping hazards at construction sites using OVOD models (Grounding DINO) and the Segment Anything Model (SAM), highlighting the superior generalization ability of OVOD in civil engineering scenarios compared to traditional methods. c) 2D-3D Open-Vocabulary Semantic Segmentation Implemented Open-Vocabulary Semantic Segmentation (OVSS) based on OVOD and k-means clustering algorithm in 3D photogrammetric cloud point data.	

WORK EXPERIENCE

Prime Robotics	Denver, CO
Robotics Intern, Manager: Ryan Austin	05/2026 - Present
- Developed, optimized and maintained a production-grade multi-agent path planning system supporting 10+ agents in real-time environments. - Trained and integrated large-scale AI models to continuously optimize planning accuracy and system throughput.	

PUBLICATIONS

- Xu, J.**, Chen, M., Wang, S., Sui, Y., & Shi, Y. (2026). *VLAQuantBench: Benchmarking Post-Training Quantization for Vision-Language-Action Models under Closed-Loop Control*.
- Xu, J.**, Qian, C., Tu, Z., Sui, Y., & Shi, Y. (2026). *FastVLA: Instruction-Conditioned and Temporally Adaptive Visual Token Compression for Efficient Vision-Language-Action Models*.
- Vahidi, M., **Xu, J.**, Shi, Y., & Liu, K. (2026). *Domain Knowledge-Infused Prompting for Deep and Full-Sentence Information Extraction from Bridge Inspection Reports*.
- Xu, J.**, Kim, R., Ye, Y., & Shi, Y. (2026). *An autoregressive-based framework for simulating stochastic occupant behavior in residential buildings*. Building Simulation. Vol. 19. No. 2. Tsinghua University Press,

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2026. <https://link.springer.com/article/10.1007/s12273-026-1406-3>
- **Xu, J.**, Chen, M., & Shi, Y. (2026). *GenVision: Enhancing Construction Safety Monitoring with Synthetic Image Generation*. 2025 Winter Simulation Conference (WSC). IEEE, 2025. <https://ieeexplore.ieee.org/abstract/document/11338881>
 - **Xu, J.**, Jin, Q., Chen, M., Feng, A., Sui, Y., & Shi, Y. (2025). *LowDiff: Efficient Diffusion Sampling with Low-Resolution Condition*. ArXiv.org. <https://arxiv.org/pdf/2509.15342>
 - Chen, M., Leal, L., Hu, Y., Liu, R., Xiong, B., Feng, A., **Xu, J.**, & Shi, Y. (2025). *IDU: Incremental Dynamic Update of Existing 3D Virtual Environments with New Imagery Data*. ArXiv.org. <https://arxiv.org/abs/2508.17579>
 - Liu, Z., **Xu, J.**, Wun, C., Chen, M., Zou, Z., & Shi, Y. (2025). *Egocentric Camera-Based Method for Detecting Static Hazardous Objects on Construction Sites*. *Automation in Construction* 172 (2025): 106048. <https://www.sciencedirect.com/science/article/pii/S0926580525000883>
 - **Xu, J.**, Chen, M., Feng, A., Yu, Z., & Shi, Y. (2024). *Open-Vocabulary High-Resolution 3D (OVHR3D) Data Segmentation and Annotation Framework*. ArXiv.org. <https://arxiv.org/abs/2412.06268>
 - **Xu, J.**, Sanni, T., Liu, Z., Yang, Y., Lee, J., Song, W., & Shi, Y. (2024). *To Shelter or Not To Shelter: Exploring the Influence of Different Modalities in Virtual Reality on Individuals' Tornado Mitigation Behaviors*. ArXiv.org. <https://arxiv.org/abs/2409.09205>
 - Chen, M., Lal, D., Yu, Z., **Xu, J.**, Feng, A., You, S., Nurunnabi, A., & Shi, Y. (2024). *Large-Scale 3D Terrain Reconstruction Using 3D Gaussian Splatting for Visualization and Simulation*. *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, XLVIII-2-2024, 49–54. <https://doi.org/10.5194/isprs-archives-xlvi-2-2024-49-2024>

CONFERENCE PRESENTATIONS

- “EgoVision: Generate Egocentric Images on Construction Sites using Diffusion Model”, [CRC 2026](#), San Antonio Marriott Rivercenter on River Walk, San Antonio, TX, March 18th – 21st, 2026
- “GenVision: Enhancing Construction Safety Monitoring with Synthetic Image Generation”, [WSC 2025](#), Sheraton Grand Seattle, Seattle, WA, December 7th – 10th, 2025
- “An Open Vocabulary Framework for Efficient 2D-3D Visual Data Annotation in Indoor and Outdoor Built Environments”, [i3ce 2024](#), Carnegie Mellon University, Pittsburgh, PA, July 28th – 31st, 2024
- “A Hybrid 2D-3D Zero-shot Framework for Photogrammetric Data Segmentation”, [Geo Week 2024](#), Colorado Convention Center, Denver, CO, February 11th – 13th, 2024
- “USC-ICT Semantic Terrain Points Labeling System Demo”, [IITSEC 2023](#), West Concourse of the Orange County Convention Center, Orlando, FL, November 27th – December 1st, 2023

PEER REVIEW EXPERIENCE

IEEE Transactions on Neural Networks and Learning Systems

- Unsupervised Domain Adaptation with Extended Multimodal LSTM for End-to-end Classification of Multisource Remote Sensing Data
- Hybrid Convolution Reparameterization for Non-Precipitation Echo Recognition and Removal
- Robust Image-Based Visual Servoing Formation Control for Quadrotors without Communication via Reinforcement Learning
- Spatiotemporal-Aware Visual Captioning for Industrial Applications

International Journal of Data Science and Analytics

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- GAMEDX: Generative Artificial Intelligence-based Medical Entity Data Extractor Using Large Language Models

40th Annual Conference on Neural Information Processing Systems – NeurIPS 2026

- Visibility-Aware Generative UV Camouflage with Photometric Adaptation for Vehicle Detectors

29th Annual Conference on Artificial Intelligence and Statistics – AISTATS 2026

- Unbiased GNN Learning via Fairness-Aware Subgraph Diffusion
- Fair Treatment Effect Estimation through Neural Networks

Journal of Computing in Civil Engineering

- Multi-User Collaboration in Augmented Reality for Beyond-Visual-Line-of-Sight Bridge Inspection
- Text2BIM: Generating Building Models Using a Large Language Model-based Multi-Agent Framework
- GADM-APE: A Genetic Algorithm-Driven, Definition-Integrated, Multistep Automatic Prompt Engineer Framework for Disaster Tweet Classification
- An Agency-specific Project Authoring Advisor: An LLM-based RAG System with Automatic Prompt Optimization Method
- Development and Characterization of Large Language Models for Knowledge Retrieval and Safety Measure Generation in Construction Safety Management
- A Prompting Framework for ChatGPT-based Twitter User Classification in the Context of Disasters for the Journal of Computing in Civil Engineering
- Building Code Question-Answering Systems Enhanced by Large Language Models and Knowledge Graph-based Retrieval Augmented Generation

43rd International Symposium on Automation and Robotics in Construction – ISARC 2026

- Global Path Planning for Inspection Robots in Uneven Terrain of Construction Sites
- Field Robots for Civil Structure Maintenance and Repair: Application Status and Future Directions
- Task Planning for Autonomous Drilling Excavators Under Terrain Constraints
- Intelligent Identification Method for Complex Fillet Welds of Steel Structures based on 3D Vision and Information Entropy

42nd International Symposium on Automation and Robotics in Construction – ISARC 2025

- Paraphrasing-Based Data Augmentation for Responsible Personnel Classification in Crane Accidents

AWARDS

- American Society of Civil Engineers (ASCE) Best Data Award (2025)
- American Society of Civil Engineers (ASCE) Outstanding Reviewer (2025)