

Kanlong Ye

+1-878-256-9002 | yekanlong2000@outlook.com | kanlongy.github.io

 Kanlong Ye |  kanlongy |

Pittsburgh, Pennsylvania, United States - 15213

EDUCATION

- | | |
|---|-------------------------------|
| • Carnegie Mellon University | <i>Aug. 2024 – May. 2026</i> |
| <i>M.S. in Mechanical Engineering - Research (Robotics Track) GPA: 4.0/4.0</i> | Pittsburgh, USA |
| • Dalian University of Technology | <i>Sept. 2019 – Jul. 2024</i> |
| <i>B.E. in Mechanical Design & Manufacturing and Their Automation (Japanese Intensive) GPA: 3.7/4.0</i> | Dalian, China |
| • Tohoku University | <i>Oct. 2022 – Aug. 2023</i> |
| <i>Exchange Student in Mechanical and Aerospace Engineering Department</i> | Sendai, Japan |

PUBLICATIONS

C=CONFERENCE, J=JOURNAL, W=WORKSHOP, A=ARXIV

- [A.1] **LV-DOT: LiDAR-visual dynamic obstacle detection and tracking for autonomous robot navigation.** Zhefan Xu*, Haoyu Shen*, Xinming Han, Hanyu Jin, **Kanlong Ye**, Kenji Shimada *arXiv:2502.20607*
- [W.1] **Adaptive Planning Framework for UAV-Based Surface Inspection in Partially Unknown Indoor Environments.** Hanyu Jin, Zhefan Xu, Haoyu Shen, Xinming Han, **Kanlong Ye**, Kenji Shimada *ICRA 2025 Construction Robotics Workshop*

EXPERIENCE

- | | |
|--|------------------------------|
| • CERLAb, Carnegie Mellon University | <i>Aug. 2024 – Present</i> |
| <i>Research Assistant (Supervisor: Kenji Shimada)</i> | Pittsburgh, USA |
| ◦ Implemented Transformer-PPO architecture for wind-resilient UAV RL-control, modeling various wind fields in Gazebo/Isaac Sim and training distributed wind-aware policies that improved UAV navigation robustness. | |
| ◦ Contributed to the development of the popular open project CERLAb UAV Autonomy stack in ROS, Gazebo, and Isaac Sim. Integrated point cloud reconstruction after dynamic obstacle removal. | |
| ◦ Built a custom LiDAR-based UAV platform and conducted real tunnel inspection tests for Toprise Inc Japan., achieving high-resolution 3D reconstruction (accuracy < 5cm) | |
| • Perfection AI | <i>May. 2025 – Aug. 2025</i> |
| <i>Software Engineer Intern</i> | Pittsburgh, USA |
| ◦ Benchmarked state-of-the-art vision-language models (Qwen2.5-VL, Tarsier, GPT-4o, Gemini 2.5 Pro) for golf advice accuracy and curated domain-specific datasets for fine-tuning. | |
| ◦ Designed and iteratively refined prompt engineering strategies, transforming generic outputs into personalized and actionable coaching feedback. | |
| ◦ Incorporated key frame analysis and biomechanical metrics into the feedback pipeline, improving swing issue detection and user trust in model-generated advice. | |

PROJECTS

- | | |
|--|---|
| • Pittsburgh-RAG: Retrieval-Augmented Generation for QA on Pittsburgh | <i>Sep. 2025 - Oct. 2025</i> |
| <i>LLM, NLP, Information Retrieval</i> |  |
| ◦ Built an end-to-end RAG system from scratch, including data collection/annotation, document chunking, hybrid retrieval (BM25, FAISS dense retrieval, and fusion), and answer generation with Gemma-3, to support factual QA on Pittsburgh and CMU. | |
| • DDPM-AFHQ: [Denoising Diffusion Probabilistic Model on AFHQ Dataset] | <i>Jun. 2025 – Aug. 2025</i> |
| <i>Generative Models of Images, Diffusion Model</i> |  |
| ◦ Implemented a Denoising Diffusion Probabilistic Model from scratch and applied it to the AFHQ dataset for high-quality image generation. Conducted experiments with noise scheduling, U-Net architecture, achieved competitive FID scores. | |
| • Build-LLAMA2: [Mini Llama2 Transformer Implementation] | <i>Aug. 2025 - Sep. 2025</i> |
| <i>Deep Learning, Natural Language Processing</i> |  |
| ◦ Implemented core components of the Llama2 transformer architecture from scratch, including GQA, feed-forward networks, Pre-LayerNorm, RoPE, AdamW and integrated parameter-efficient fine-tuning via LoRA, WiSE-FT and applied the model to tasks such as text continuation, zero-shot classification, and downstream fine-tuning. | |
| • Windy-NavRL: [Wind-resilient RL Framework for UAV Navigation] | <i>Feb. 2025 - Present</i> |
| <i>Reinforcement Learning, Deep Learning</i> |  |

- Developed new architecture for wind-resilient UAV RL-control based on [NavRL framework](#), modeling various wind fields in Gazebo/Isaac Sim and training distributed wind-aware policies that improved UAV navigation robustness.

- **ORB-SLAM3 on Various Physical Robots using ROS2**

SLAM, ROS2, Robotics

Sept. 2024 - Dec.2024



- Modernized the ORB-SLAM3 framework for compatibility with Ubuntu 20.04 and ROS2, and deployed the implementation on diverse robotic platforms (wheeled, aerial, and quadruped) to perform real-world localization and mapping tasks.

- **Optimal Control and A* Path Planning for Autonomous Vehicles**

Optimal Control, LQR, A Search*

Aug. 2024 - Dec. 2024



- Designed a Linear-Quadratic Regulator (LQR) for high-speed trajectory tracking and integrated an A* search algorithm for dynamic path re-planning to perform safe overtaking maneuvers, maintaining an average path tracking error of 0.76m.

SKILLS

- **Languages:** Chinese (Native), English (Fluent), Japanese (Fluent)
- **Programming:** C/C++, Python, MATLAB, Git, JavaScript
- **Frameworks & Libraries:** PyTorch, NumPy, OpenCV, ROS
- **Robotics & AI:** Path Planning, SLAM, Object Detection, RL, LLM, VLM
- **Software & Tools:** Isaac-sim, Gazebo, MuJuCo, AutoCAD, SolidWorks, Ansys, Wandb