Chahyon Ku
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RESEARCH INTERESTS

My PhD research focuses on robot learning for mobile manipulation, through fusing semantic features from vision language models (VLM) with explicit spatial structure. My first project proposed a language-grounded hierarchical representation for efficient exploration in mobile pick and place tasks. My current research focuses on jointly optimizing a mobile robot's trajectory and action over semantically rich features from vision language models (VLM).

EDUCATION

Doctor of Philosophy in Robotics
University of Michigan 09/2024 - 05/2029
- Advisor: Bernadette Bucher
- Research: Robot Learning for Mobile Manipulation

Master of Science in Robotics
University of Minnesota 09/2022 - 05/2024
- Advisor: Karthik Desingh
- Research: Imitation Learning for Manipulation, Object-centric Representations

Bachelor of Science in Computer Science
University of Washington 09/2016 - 08/2022
- Research: Object-centric Representations, Instance Segmentation
- Coursework: Machine Learning, Computer Vision, Natural Language Processing

RESEARCH

Publications

Chahyon Ku, Carl Winge, Ryan Diaz, Wentao Yuan, and Karthik Desingh. Evaluating Robustness of Visual Representations for Object Assembly Tasks Requiring Spatio-geometrical Reasoning. ICRA 2024.

Preprints

Chahyon Ku, Erica Tevere, Georgios Georgakis, Rudra Mukherjee, and Bernadette Bucher. OWLS: Open-world Language-conditioned Speed Fields for Zero-Shot Rover Navigation. Presented at CVPR 2026 AI4Space Workshop, Under review at ICRA 2027.

Anton Arapin, **Chahyon Ku**, and Bernadette Bucher. Action Jets: Learning the Local Shape of the Action-Conditioned Data Manifold. Under review at ICLR 2027.

Aparajito Saha, Zhen Hao Gan, Jinjia Guo, Jacob Skwirsk, Jeremy Acheampong, Anton Arapin, **Chahyon Ku**, Yue Hu, Nima Fazeli, and Bernadette Bucher. ForageBench: A Photorealistic, Physically Grounded Benchmark for Interactive Object Search. Planned for submission to CVPR 2027.

Aparajito Saha, Zhen Hao Gan, Jinjia Guo, Jacob Skwirsk, Jeremy Acheampong, Anton Arapin, **Chahyon Ku**, Yue Hu, Nima Fazeli, and Bernadette Bucher. PhyGS: Physically-Grounded Controllable Scene Generation. Presented at CVPR 2026 MEIS Workshop.

Katrina Ashton, **Chahyon Ku**, Shrey Shah, Wen Jiang, Kostas Daniilidis, and Bernadette Bucher. HELIOS: Hierarchical Exploration for Language-grounded Interaction in Open Scenes. Presented at CoRL 2025 LEAP Workshop, To be submitted to RA-L.

Chahyon Ku, Noah Ponto, Muru Zhang, Rachel Soto-Garcia, and Karthik Desingh. Evaluating SORNet on a Geometric and Spatial (GeoSpa) Reasoning Dataset. https://chahyon-ku.github.io/sornet-geospa/.

EMPLOYMENT

Intern, Research
NASA Jet Propulsion Laboratory 09/2025 - 12/2025
06/2026 - 08/2026

- Proposed a camera-only navigation framework for jointly optimizing a mobile robot's trajectory and actions through visual serviong on capability-conditioned traversability metrics obtained zero-shot from vision language models (VLM).
- Publication in preparation.

Intern, Perception
Waymo 06/2025 - 09/2025

- Reimplemented and extended a recently published state-of-the-art method for 3D object detection from camera and LIDAR observations.

Intern, Perception
Zoox 06/2023 - 09/2023

- Developed computer vision models for improving over-conservative behavior around pedestrians by generating a dataset of 1 million relevant samples.

TEACHING

Graduate Teaching Assistant
Introduction to Intelligent Robotics (CSCI 5551) 09/2023 - 05/2024

- Adapted the kineval-stencil framework by Professor Chad Jenkins to create a mobile manipulation assignment combining concepts from previous assignments in kinematics, path planning, and state machines.

Undergraduate Teaching Assistant
Artificial Intelligence (CSE 473) 04/2022 - 06/2022

- Created and graded problem sets on search, Markov decision processes, and reinforcement learning.