Haochen Zhang

haochen4@andrew.cmu.edu

412-589-4898
linkedin.com/in/HaochenZ11
haochenz11.github.io

Education

AUG 2023 – PRESENT
MS in Robotics (4.17/4.33 cGPA) / Carnegie Mellon University
24-month research-based program; Expected graduation Aug 2025

SEPT 2018 – JUN 2023
BASc in Engineering Science (3.90/4.0 cGPA, High Honours) / University of Toronto
Specializing in **Electrical and Computer Engineering** (ECE)
Minor in **Artificial Intelligence**, Certificate in **Engineering Leadership**

Publications

H. Zhang*, N. Zantout*, P. Kachana, Z. Wu, J. Zhang, and W. Wang. 2025. "IRef-VLA: A Benchmark for Interactive Referential Grounding with Imperfect Language in 3D Scenes". *Submitted, under review*. IEEE International Conference on Robotics & Automation (ICRA), May 2025

K. McCleary, P. R. M. Fisch, **H. Zhang**, Z. Manchester, B. Lucia. 2025. "Lunar Voodoo: Lunar Visual-Only Onboard Determination Of Orbit". *Submitted, under review*. IEEE International Conference on Robotics & Automation (ICRA), May 2025

H. Zhang, N. Zantout, P. Kachana, J. Zhang, and W. Wang. 2024. "VLA-3D: A Dataset for 3D Semantic Scene Understanding and Navigation". Presented at the 1st Workshop for Semantic Reasoning and Goal Understanding in Robotics (SemRob), Robotics Science and Systems Conference (RSS), July 2024

H. Zhang*, A. Korikov*, P. Farinneya, M.M. Abdollah Pour, M. Bharadwaj, A. Pesaranghader, X.Y. Huang, Y.X. Lok, Z. Wang, N. Jones, and S. Sanner. 2023. "Recipe-MPR: A Test Collection for Evaluating Multi-aspect Preference-based Natural Language Retrieval". In Proceedings of the 46th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR '23), July 23–27, 2023

M.S. Hosseini, B.E. Bejnordi, V.Q.H. Trinh, L. Chan, D. Hasan, X. Li, S. Yang, T. Kim, **H. Zhang**, T. Wu, and K. Chinniah. "Computational Pathology: A Survey Review and The Way Forward," *Journal of Pathology Informatics*, p. 100357, Jan. 2024.

Presentations

APRIL 2023
Multi-aspect Natural Language Preference-based Retrieval
Undergraduate Thesis Talk, University of Toronto

OCT 2024
CMU VLA Challenge: Details and Results
Workshop Presentation, IROS 2024 AI Meets Autonomy Workshop

Research Experience

SEPT 2023 – PRESENT
Master's Research Student / AirLab & Field Robotics Center, CMU
Under the supervision of Ji Zhang and Wenshan Wang

- Research in interactive **vision-language navigation** for autonomous agents and 3D semantic scene understanding
- Lead student organizer of the **CMU Vision-Language-Autonomy Challenge**
- Lead organizer of **AI Meets Autonomy: Vision, Language, and Autonomous Systems Workshop** at the 2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

MAY 2024 – DEC 2024
Research Assistant / Abstract Research Group, CMU
Under the supervision of Brandon Lucia

- Part-time research assistant in **visual determination of orbit** for cube satellite systems
- Assisted with rendering synthetic satellite data, vision-based landmark detection, and salient feature matching for localization

MAY 2022 – APR 2023
Undergraduate Thesis Student / Data-Driven Decision Making Lab, UofT
Under the supervision of Scott Sanner

- Led curation of novel **natural-language multi-aspect preference retrieval (MPR) dataset** and authored related resource paper
- Implemented sparse IR, dense neural IR, and large language model-based benchmarking methods using **Python/PyTorch**

MAY 2020 – MAY 2021
Research Student / Multimedia Laboratory, UofT

- Classification and detection of histological tissue types with deep learning in **PyTorch**
- Automated creation of large, standardized tissue dataset with **Python**
- Contributed to a computational pathology survey paper of over 300 papers
- Investigated multi-label classification with supervised contrastive learning

Work Experience

JAN 2025 – MAY 2025
Teaching Assistant / Carnegie Mellon University, Robotics Institute

- Teaching Assistant for **16-831 Introduction to Robot Learning** (graduate course)

MAY 2021 – AUG 2022
ML System Software Engineering Intern / Qualcomm Canada

- Developed APIs in **C++** and testing tools in **Python**
- Contributed to new features in an embedded AI compiler pipeline in **C++**
- Helped with **quantization**, conversion, and fine-tuning of AI models using **PyTorch**
- Adapted **TinyML** benchmarking framework for **Arduino**
- Trained object detection and classification models for a smart garbage can powered by **Raspberry Pi**
- Organized events and volunteered in community outreach as a **Qwomen Board of Canada** member

MAY 2019 – AUG 2019
Data Science and QA Intern / SensorUp Inc.

- Extracted and analyzed geospatial IoT data with **Python, ElasticSearch, Kepler.gs** to verify products
- Load-tested back-end frameworks and APIs with **K6**
- Worked with **Git/Github**, and AWS Infrastructure including **S3, DynamoDB**

Volunteering

JAN 2024 – PRESENT
Committee Member / Robotics Institute Student Organization (RISO)

OCT 2023 – PRESENT
PAIR Undergraduate AI Mentor / CMU

OCT 2023 – PRESENT
Campus Affairs Committee Member / Graduate Students Association

JAN 2024 – MAY 2024
Committee Member / Women@SCS, SCS4All

OCT 2023 – MAY 2024
Research Track Mentor / UofT Machine Intelligence Student Team (UTMIST)

Awards

- Vector Scholarship in Artificial Intelligence (2023) – awarded, forfeited
- IEEE Toronto Student Scholarship, IEEE Toronto (2022)
- Bruno D. Stefano Scholarship, IEEE Toronto (2021)
- Laura Chizuko Fujino Scholarship in Engineering Science, University of Toronto (2020)
- ESROP Research Fellowship, Division of Engineering Science (2020)
- Dean's Merit Award, University of Toronto (2018)

Society Memberships

- IEEE Student Member