

Haochen Zhang

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Education

Incoming PhD in Robotics Student (Fall 2025) / Carnegie Mellon University

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". 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

MAY 2025 – AUG 2025

Research Intern / Honda Research Institute USA

- Research in multimodal scene understanding and embodied question-answering

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 and Mentoring

JAN 2024 – PRESENT

MS Data Science Capstone Mentor / CMU

JAN 2024 – PRESENT

Committee Member / Robotics Institute Student Organization (RISO)

OCT 2023 – PRESENT

Campus Affairs Committee Member / Graduate Students Association

OCT 2023 – MAY 2025

PAIR Undergraduate AI Mentor / CMU

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, IEEE RAS Student Member