Yi Ru (Helen) Wang

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Education

University of Washington **September 2022 – Present**
Ph.D. in Computer Science *Seattle, Washington*
Research on evaluation, representation, and reasoning for robot manipulation (Advisors: Siddhartha Srinivasa, Dieter Fox)

University of Toronto **September 2017 – June 2022**
Bachelor of Applied Science in Engineering Science - Specialization in Robotics, Minor in AI *Toronto, Canada*
Thesis: Learning-based Perception for Transparent Objects (Advisors: Animesh Garg, Florian Shkurti)

Experience

University of Washington **August 2022 – Present**
Ph.D. Student *Seattle, Washington*

- Advised by Prof. Siddhartha Srinivasa and Prof. Dieter Fox.
- Research on evaluation, representation, and reasoning for robotic manipulation, with a focus on multi-modal learning, structured benchmarks, and foundation models.
- Publications include first-author and collaborative works at top venues such as CoRL 2023 [8] [6], EMNLP 2023 [7], ICML 2025 [4], and multiple works under submission [1], [3], [2].

NVIDIA Research **January 2024 – December 2024**
Research Scientist Intern *Seattle, Washington*

- Advised by Fabio Ramos and Dieter Fox.
- Language-guided scene generation and plan synthesis for manipulation tasks; also trained VLA Models.
- Working with IsaacSim and Gym for synthetic data generation and simulations; and building behaviour cloning models.

University of Toronto, Vector Institute **October 2020 – Sept 2022**
Undergraduate Researcher *Toronto, Canada*

- Advised by Prof. Animesh Garg and Prof. Florian Shkurti for research on transparent objects perception with liquids.
- Introduced a novel method for depth completion of transparent objects using a joint point cloud and depth refinement approach, in addition to an automated pipeline that automatically collects and annotates RGB-D Data.
- First author paper accepted by Conference on Robot Learning (CoRL) 2021 as Oral Presentation [6.5% Acceptance Rate] [11]; another work under review [10].
- First-author work on multi-view multi-task perception for transparent objects accepted to ICRA 2023 [9].

University of Toronto **May 2021 – August 2021**
NSERC USRA Research Student *Toronto, Canada*

- Designed a novel method and efficient training procedure for optimal CNN channel size search.
- First author paper accepted by International Conference on Machine Learning Applications (ICMLA) 2021 as oral [12].
- Supervised by Prof. KN. Plataniotis & Dr. Mahdi Hosseini & funded by Natural Sciences and Engineering Research Council of Canada Undergraduate Student Research Awards (NSERC USRA).

Canada Research Center, Huawei Technologies **May 2020 – April 2021**
Research Engineer Intern *Toronto, Canada*

- Research on machine learning methods for wireless localization.
- Investigated Bayesian probabilistic representations, Gaussian mixture networks, and estimation algorithms.
- Conducted literature reviews, developed algorithms, delivered presentations on research findings, and drafted academic reports on research process.

Publications

[1] **Yi Ru Wang**, Carter Ung, Grant Tannert, Jiafei Duan, Josephine Li, Amy Le, Rishabh Oswal, Markus Grotz, Wilbert Pumacay, Yuquan Deng, Ranjay Krishna, Dieter Fox, Siddhartha Srinivasa. RoboEval: Where Robotic Manipulation Meets Structured and Scalable Evaluation, *In Submission*, 2025 [Paper Link] [Website]

[2] Jason Lee, Jiafei Duan, Haoquan Fang, Yuquan Deng, Shuo Liu, Boyang Li, Bohan Fang, Jieyu Zhang, **Yi Ru Wang**, Sangho Lee, Winson Han, Wilbert Pumacay, Angelica Wu, Rose Hendrix, Karen Farley, Eli VanderBilt, Ali Farhadi, Dieter Fox, Ranjay Krishna. MolmoAct: Action Reasoning Models that can Reason in Space, *arXiv preprint*, 2025 [Paper Link]

[3] Long Cheng, Jiafei Duan, **Yi Ru Wang**, Haoquan Fang, Boyang Li, Yushan Huang, Elvis Wang, Ainaz Eftekhar, Jason Lee, Wentao Yuan, Rose Hendrix, Noah A. Smith, Fei Xia, Dieter Fox, Ranjay Krishna. PointArena: Probing Multimodal Grounding Through Language-Guided Pointing, *In Submission*, 2025 [Paper Link] [Website]

[4] Haoquan Fang, Markus Grotz, Wilbert Pumacay, **Yi Ru Wang**, Dieter Fox, Ranjay Krishna, Jiafei Duan. SAM2Act: Integrating Visual Foundation Model with A Memory Architecture for Robotic Manipulation, *In International Conference on Machine Learning (ICML)*, 2025 [Paper Link] [Website]

[5] Jiafei Duan, Wilbert Pumacay, Nishanth Kumar, **Yi Ru Wang**, Shulin Tian, Wentao Yuan, Ranjay Krishna, Dieter Fox, Ajay Mandlekar, Yijie Guo. Manipulate-Anything: Automating Real-World Robots using Vision-Language Models, *In Submission* [Paper Link] [Website]

[6] Jiafei Duan*, Wentao Yuan*, Wilbert Pumacay, **Yi Ru Wang**, Kiana Ehsani, Dieter Fox, Ranjay Krishna. Manipulate-Anything: Automating Real-World Robots using Vision-Language Models, *In Conference on Robot Learning (CoRL) 2024* [Paper Link] [Website]

[7] **Yi Ru Wang**, Jiafei Duan, Dieter Fox, Siddhartha Srinivasa. NEWTON: Are Large Language Models Capable of Physical Reasoning?, *In Conference on Empirical Methods in Natural Language Processing (EMNLP) 2023* [Paper Link] [Website][Code]

[8] Jiafei Duan, **Yi Ru Wang**, Mohit Shridhar, Dieter Fox, Ranjay Krishna. AR2D2: Training a Robot Without A Robot, *In Conference on Robot Learning (CoRL) 2023* [Paper Link] [Website]

[9] **Yi Ru Wang***, Yuchi Zhao*, Haoping Xu*, Alan Aspuru-Guzik, Florian Shkurti, Animesh Garg. MVTrans: Multi-View Perception for Transparent Objects, *In IEEE International Conference on Robotics and Automation 2023* [Paper Link] [Website] [Code]

[10] Sagi Eppel, Haoping Xu, **Yi Ru Wang**, and Alan Aspuru-Guzik. Predicting 3d shapes, masks, and properties of materials, liquids, and objects inside transparent containers, using the Transproteus CGI dataset, *In Submission*, 2021 [Paper Link] [Code Link]

[11] **Yi Ru Wang***, Haoping Xu*, Sagi Eppel, Alan Aspuru-Guzik, Florian Shkurti, and Animesh Garg. Seeing Glass: Joint Point-Cloud and Depth Completion for Transparent Objects. In *5th Annual Conference on Robot Learning (CoRL)*, 2021 **[Oral Presentation (6.5% Acceptance Rate)]** [Peer Reviewed] [Paper Link] [Website Link]

[12] **Yi Ru Wang***, Samir Khaki*, Weihang Zheng*, Mahdi S. Hosseini*, and Konstantinos N. Plataniotis. CONetV2: Efficient Auto-Channel Size Optimization for CNNs. In *International Conference on Machine Learning and Applications*, 2021 **[Oral Presentation]** [Peer Reviewed] [Paper Link] [Code Link]

Achievements

National Graduate Research Award (NSERC-PGSD) **2023-Present**
Awarded to Ph.D. candidates conducting research in science and engineering on the basis of academic merit and research aptitude.

CRA Outstanding Undergraduate Research Award - Honourable Mention **2022**
Award recognizes undergraduate students in North American universities who show outstanding research potential in an area of computing research. Received honourable mention.

National Undergraduate Research Award (NSERC USRA) **2021**
Awarded to Canadian undergraduate science and engineering students on the basis of academic merit and research aptitude.

UofT Engineering Dean's Honour List **2018, 2020, 2021, 2022**
Awarded to students who achieved an 80%+ Average.

Jack Gorrie Memorial Undergraduate Scholarship **2019**
The award is made on the basis of academic achievement and involvement in extra-curricular activities within the University.

University of Toronto Summer Research and International Experience Award **2018, 2019**
Awarded on the basis of academics and extracurricular involvement for research at National University of Singapore and KMUTT.

University of Toronto Engineering Science Research Fellowship **2018, 2019**
Awarded on the basis of academics and extracurricular involvement for research at National University of Singapore and KMUTT.

Ham, Jane Elizabeth Memorial Scholarship **2017, 2018**
Awarded on the basis of academic achievements and extracurricular involvements.

Dean's Merit Scholarship **2017**
Awarded on the basis of academic accomplishments and extracurricular involvement.

University of Toronto Scholar **2017**
Awarded on the basis of academic merit and citizenship, to the top 1% of incoming University of Toronto Students.

Canada Governor General's Medal for Academic Excellence **2017**
Awarded on the basis of academic achievements to the top graduating student.

Durham District School Board Gifted Award **2017**
Awarded to students who scored at the 98th percentile or higher on the WISC-IV.

Leadership / Extracurricular Activities *(Click on the Club for More Information)*

IEEE Robotics and Automation Society - Student Activities Committee **January 2024 – Present**
Chair *Seattle, WA*

- The goal of the SAC is to represent students in robotics worldwide.
- Responsible for organizing and managing activities, promotions, and competitions to recruit students and keep student members active.
- Oversees a team of 9 co-chairs and serves 200+ student sections encompassing 5000+ students worldwide.

University of Toronto Robotics Association (UTRA) **September 2017 – June 2022**
President *Toronto, Canada*

- UTRA is the largest student-run design team at UofT, with six subteams, 30 executives, and 100+ members.
- Drives the progress of UTRA and manages progress of six teams including RoboSoccer, Autonomous Rover, PacBot, Combat, SUMO, and Robonars.
- Provides technical expertise to teams preparing for Robobrawl (Semi-Finalist in 2019), IGVC, and RoboCup.

UofT Autonomous Driving Group (aUToronto) **August 2020 – July 2021**
Perception Lead *Toronto, Canada*

- Led a team of 13 members for collaborative research development towards robust perception for Level 4 Autonomy.
- Managed projects for LiDAR and Image based perception of various road agents, spanning pedestrian detection, lane and road detection, and lights and signs detection.
- Champion of the SAE/GM AutoDrive Challenge in June 2021.

Invited Talks and Community Service

ICRA 2025 Organizing Committee **2025**
Student engagement chair for the International Conference on Robotics and Automation (ICRA) 2025 in Atlanta, Georgia

Conference on Robot Learning (CoRL) 2025 Workshop Organizer **2025**
Organizing a full-day workshop titled Making Sense of Data in Robotics: Composition, Curation, and Interpretability at Scale

Reviewer **2022, 2023, 2024, 2025**
Conference on Robot Learning (CoRL), International Conference on Robotics and Automation (ICRA), Computer Vision and Pattern Recognition (CVPR), International Conference on Computer Vision (ICCV), European Conference on Computer Vision (ECCV)

Technical Skills

Languages / Libraries: Python, PyTorch, TensorFlow, ROS, NumPy, OpenCV
Developer Tools/Frameworks: VS Code, LaTeX, Linux, GitHub, Docker, Spyder

Relevant Coursework (* denotes graduate level courses)

- Introduction to AI (A+)
- Methods of Data Analysis* (A)
- Algos and Data Structures (A-)
- AI Fundamentals (A)
- Microprocessors and Embedded Microcontrollers (A)
- Electronics for Robotics (A)
- Linear Control Theory* (A+)
- Computer Vision for Robotics* (A-)
- Engineering Science Thesis (A+)
- Neural Networks and Deep Learning* (A+)
- Mobile Robotics and Perception* (A+)
- Robotics Capstone Design (A+)