# Ryan Diaz

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github.com/RyangDiaz

## Education

**Rice University** — Aug. 2025 – Present
*Doctor of Philosophy, Computer Science* — *Houston, TX*

**University of Minnesota, Twin Cities** — Sep. 2021 – May 2025
*Bachelor of Science, Computer Science and Mathematics* — *Minneapolis, MN*

- **Honors:** summa cum laude with high distinction (GPA 4.0/4.0)
- **Relevant Coursework:** Deep Learning for Robot Manipulation, Machine Learning, Data Analysis, Computer Vision, Natural Language Processing, Stochastic Processes, Artificial Intelligence, Linear Algebra, Probability and Statistics

## Research Experience

**Human-Centered AI and Robotics Group**, Rice University — Aug. 2025 – Present
*Graduate Researcher, Advised by Prof. Vaibhav Unhelkar* — *Houston, TX*

**Robotics: Perception and Manipulation Lab**, University of Minnesota, Twin Cities — Dec. 2022 – May 2025
*Undergraduate Researcher, Advised by Prof. Karthik Desingh* — *Minneapolis, MN*

- Trained robotic manipulation policies using behavior cloning with image and force-torque data on a contact-rich peg-in-hole insertion task. [Project Page]
- Evaluated robustness of 8 pretrained vision encoders in a novel 6-DoF bimanual peg-in-hole insertion task with respect to peg/hole shape and grasp variations. [Project Page]
- Leveraged the Blender Python API to programmatically generate large-scale datasets of cap and bottle geometries that vary widely in size and shape. [Project Page]

**CERL Lab**, Washington University in St. Louis — May 2024 – Aug. 2024
*Undergraduate Researcher (NSF REU), Advised by Prof. Yevgeniy Vorobeychik* — *St. Louis, MO*

- Utilized reinforcement learning and imitation learning algorithms with image inputs to teach a simulated autonomous vehicle to maneuver around static obstacles in its path. [Project Page]
- Implemented a system of data collection in the CARLA simulation, automatically annotating over 1000 images for object detection model training.
- Constructed a ROS node to deploy trained object detection models on a real-world autonomous agent in a scaled-down urban environment.

## Publications

### Conference Publications

C1. Chahyon Ku, Carl Winge, **Ryan Diaz**, Wentao Yuan, and Karthik Desingh, "Evaluating Robustness of Visual Representations for Object Assembly Task Requiring Spatio-Geometrical Reasoning," in *IEEE International Conference on Robotics and Automation (ICRA)*, 2024.

### Peer-Reviewed Workshop Papers

W1. **Ryan Diaz**, Adam Imdieke, Vivek Veeriah, and Karthik Desingh, "AugInsert: Learning Robust Visual-Force Policies via Data Augmentation for Object Assembly Tasks", in *Beyond Pick and Place Workshop @ IEEE International Conference on Robotics and Automation (ICRA)*, 2025.

## Presentations

**Poster: WashU STEM Poster Palooza** — Aug. 2024
*"Vision-Based Algorithms for Obstacle Detection and Avoidance in Autonomous Vehicles"* — *St. Louis, MO*

**Video: UMN Undergraduate Research Symposium** — Dec. 2023
*"Augmenting a Dual-Arm Contact-Rich Robotic Manipulation Task with Force-Torque Data"* — *Minneapolis, MN*

**Poster: UMN Summer Undergraduate Research Expo** — Aug. 2023
*"Imitation Learning for Spatio-Geometry Driven Assembly Task with Dual-Arm Manipulator"* — *Minneapolis, MN*

**Poster: UMN Undergraduate Research Symposium** — Apr. 2023
*"Large-Scale Object Generation for Learning Robotic Manipulation Tasks"* — *Minneapolis, MN*

## Teaching Experience

**CSCI 4521: Applied Machine Learning** — Spring 2025
*Undergraduate Teaching Assistant* — *University of Minnesota, Twin Cities*

**MATH 5652: Introduction to Stochastic Processes** — Spring 2025
*Undergraduate Paper Grader* — *University of Minnesota, Twin Cities*

**CSCI 2033: Elementary Computational Linear Algebra** — Spring 2023, Fall 2023, Fall 2024
*Undergraduate Teaching Assistant* — *University of Minnesota, Twin Cities*

**CSCI 4511W: Introduction to Artificial Intelligence** — Spring 2024
*Undergraduate Teaching Assistant* — *University of Minnesota, Twin Cities*

**CSCI 1933: Introduction to Algorithms and Data Structures** — Summer 2023
*Undergraduate Teaching Assistant* — *University of Minnesota, Twin Cities*

**UMN Taylor Tutoring Center** — Fall 2022
*Undergraduate Peer Tutor* — *University of Minnesota, Twin Cities*

## Academic Service

**Conference Reviewer**
*ICRA (2025), IROS (2025)*

**Undergraduate Peer Reviewer**
*Minnesota Undergraduate Research and Academic Journal (MURAJ) (2024-2025)*

## Awards and Honors

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| CRA Outstanding Undergraduate Researcher Award (Honorable Mention) | Jan. 2025 |
| UMN Undergraduate Research Opportunities Program (UROP) Award (x2) | Aug. 2023 – Aug. 2024 |
| UMN College of Science and Engineering Dean's List (x7) | Dec. 2021 – Dec. 2024 |
| UMN Prof. Hans H. Dalaker Mathematics Scholarship Award | Jun. 2024 |
| UMN Hopper-Dean Foundation Computer Science Scholarship Award | Jun. 2024 |
| UMN Ella Thorp Mathematics Scholarship Award | May 2023 |
| UMN Undergraduate Research Scholarship (URS) Award | Jan. 2023 |

## Technical Skills

**Languages:** Python, Java, C, C++, JavaScript, HTML, MATLAB, Bash, LaTeX
**Libraries:** PyTorch, Tensorflow, OpenCV, NumPy, ROS, Transformers (HuggingFace), MuJoCo
**Software:** Git, Linux, Blender