# William Xie

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## **EDUCATION**

*University of Colorado at Boulder*, Boulder, CO PhD student in Computer Science, GPA: 4.0/4.0 Advisor: Nikolaus Correll

*Columbia University*, New York, NY B.S. in Computer Science, GPA: 3.7/4.0

#### **PUBLICATIONS**

**William Xie,** Stefan Caldararu, and Nikolaus Correll, "Just Add Force for Delicate Robot Policies," in Workshop on Mastering Robot Manipulation in a World of Abundant Data at 8th Conference on Robot Learning (CoRL), Munich, Germany, November 2024. (website: justaddforce.github.io)

**William Xie,** Maria Valentini, Jensen Lavering, and Nikolaus Correll, "DeliGrasp: Inferring Object Properties with LLMs for Adaptive Grasp Policies," at 8th Conference on Robot Learning (CoRL), Munich, Germany, November 2024. (website: <u>deligrasp.github.io</u>)

James Watson, **William Xie**, Hadi Hasbini, Nikolaus Correll, "Open World Symbolic Planning," *In Submission*. (website: <u>correlllab.github.io/owsp</u>)

**William Xie,** Jensen Lavering, and Nikolaus Correll, "DeliGrasp: Inferring Object Properties with LLMs for Adaptive Grasp Policies," in Workshop on Vision-Language Models for Navigation and Manipulation at IEEE International Conference on Robotics and Automation (ICRA), Yokohama, Japan, May 2024.

**William Xie,** Brian Plancher, "Can Large Language Models Reduce the Barriers to Entry for High School Robotics?" Robots for Learning Workshop at the IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN), Busan, South Korea and Remote, August 2023.

#### AWARDS

National Science Foundation Graduate Research Fellowship (NSF GRFP)	April 2024
Bell Foundation Research Fellowship	November 2024

## **RESEARCH EXPERIENCE**

Research Assistant, University of Colorado at Boulder, Boulder, CO, Aug 2023 - Present

Advised by Prof. Nikolaus Correll, developing open-world grasping frameworks which synergize robot foundation models, semantic perception, force-feedback manipulation, and user interaction for robust assistance in everyday living tasks: grocery shopping, home assistance, cooking, and other such representative domains.

Research Assistant, Barnard College, A2R Lab, New York, NY, Jan - Aug 2023

Advised by Prof. Brian Plancher, created Codex for Romi, incorporating human-in-the-loop feedback systems with large language models for robot robotics education. With the goal of reducing the barriers to entry for high school robotics, enabled novice programmers in the FIRST Robotics Competition (FRC) to turn plain-English plans into executable Python code to control FRC Romi Robots.

Aug 2023 - Present

Aug 2018 - Dec 2022

Research Intern, Snap Inc. Computational Imaging Lab, New York, NY

Advised by Prof. Shree Nayar, explored finger gesture recognition device with novel sensor technologies with real-time detection at 95% accuracy. Reconstructed hand pose with novel linkage representation and modified FABRIK solver. Performed feature engineering so that ML model generalized to various hand morphologies. User studies showed further potential for generalizing to new users and robustness to gesture aberrations.

#### **TEACHING EXPERIENCE**

Head Teaching Assistant, CU Boulder, Computer Science, Boulder, CO Fall 2023, Spring 2024

CSEN 3302 — Introduction to Robotics: Co-lead weekly lab sessions and office hours with 50+ students, guiding students from programming basics with Python to using kinematics, odometry, and mapping techniques in robot simulation. Summer, Fall 2019

Teaching Assistant, Columbia University, New York, NY

MECE 4058 — Mechatronics and Embedded Microcontrollers: Provided training in PIC16F Assembler/Embedded C, circuit building and analysis, and mechatronics for 40+ students in senior-level Mechatronics and Embedded Microcontrollers course. Designed, fabricated, and programmed 30+ PCB-controlled solenoid, stepper motor, and electromagnet lab units, then lead lab tutoring sessions with hands-on code and circuit debugging with oscilloscope with students for 10+ hours a week.

# ADDITIONAL EXPERIENCE (williamxie.nvc/portfolio)

Software Development Intern, NASA Goddard Space Flight Center (GSFC), Remote Jun 2020 - Aug 2021

Jun - Aug 2021: Implemented AprilTags fiducial marker detection and pose estimation algorithm for Mars Sample Return, OSAM-1, & future missions as Orocos component in multi-robot Algorithm Development Platform (ADP). Developed Linux drivers, Qt widgets, and Orocos API for flight joysticks and USB e-stop device for robot control platform and operators in C/C++.

Jun - Dec 2020: Created data visualization application, segmenting and annotating 500 Hz flight telemetry with InfluxDB and displaying on configurable Grafana web viewer with C++ and SQL. Drastically improved robot operator debugging and monitoring experience. Incorporated ROS service call API into ADP, connecting 20+ browser-based commands to a primary robot control interface, streamlining robot operator experience and System Acceptance Test procedures.

Roll Control, CU Mechanical Engineering Senior Design, New York, NY Sep 2021 - May 2022 Designed and constructed novel rollator with modular handles, eddy current brake powered resistive wheels, and variable weight support in a team of 4. Leveraged off-the-shelf rollator, and user studies showed increased braking control and satisfaction without increasing task workload.

VentCU, CU COVID-19 Design Challenge, Remote Apr 2020 - Sep 2020 Developed open-source, fully COTS solution purchasable under \$900 and able to be assembled within 2 hours. One of five proposals to be awarded \$8000 to engineer rapid response, emergency ventilator for COVID-19 patients out of 80 proposals. Engineered in team of 5 in a fully remote environment. Implemented real-time, closed-loop control system and UI in Python, PyQt on Raspberry Pi.

Lab Superuser, CU Mechanical Engineering, New York, NY

Aug 2018 - Dec 2022

Instructed 100+ Mechanical Engineering students and lab users on using lab facilities, and assisted students, extracurricular clubs, and research groups with fabrication and design guidance. Maintain and retrofit CNC milling and lathe machines, 3D printers, laser cutters, and lab units (heat transfer test unit, PID-controlled DC motor fixtures, and wind tunnel components).

Dawning: dust, seed, coplees, Lubov, New York, NY Dec 2021 - Apr 2022 Collaborated with sculptor Mimi Park to ideate and create kinetic sculptures as part of organic, inorganic microcosm. Fused Arduino controlled, DC motor-powered wheel robots with feathers, pipe cleaner, chimes to craft creatures.

### OUTREACH

Technical Mentor, FRC Team 2036, Boulder, CO	Oct 2024 - Present
Advise 30+ high school students from throughout Boulder County as t program a 150lb, obstacle-traversing robot for the <i>FIRST</i> Robotics Con	hey design, build, and mpetition.
Lead Developer, Cantonese Medical Handbook, New York, NY	Dec 2022 - Present
Publish an online phrasebook for Cantonese medical language to facilitate services for vulnerable elderly populations in Manhattan's Chinatown, in Cantonese language program, Cantonese doctors, and Chinatown commun	e accessible language collaboration with NYU nity members.
Lead Mentor, Columbia University FIRST, New York, NY	Jun 2018 - Apr 2023
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Each year, guided 30+ high school students from South Bronx, Harlem, and Morningside Heights through a self-developed robotics curriculum and through building a 150lb, obstacle-traversing robot for the *FIRST* Robotics Competition.