Xinyue Zhu

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EDUCATION

Columbia University, School of Engineering & Applied Science New York, NY
B.S. in Computer Science, GPA: 3.90/4.00 *Aug. 2023 – May 2025*

Bard College at Simon's Rock: The Early College Great Barrington, MA
B.A. in Computer Science, GPA: 4.00/4.00 *Jan. 2021 – May 2023*

PUBLICATIONS (* INDICATES EQUAL CONTRIBUTION)

[1] **X. Zhu***, B. Huang*, Y. Li. "Touch in the Wild: Learning Fine-Grained Manipulation with a Portable Visuo-Tactile Gripper.", *NeurIPS*, 2025. [website] [paper] [video] [twitter] [code] [poster]

[2] R. Wang*, **X. Zhu***, A. Chen, J. Xu, L. Winterbottom, D. M. Nilsen, J. Stein, M. Ciocarlie. "ReactEMG: Zero-Shot, Low-Latency Intent Detection via sEMG." Under Review, 2025. [website] [paper] [video] [code]

[3] J. Xu*, Y. Jia*, D. Yang*, P. Meng, **X. Zhu**, Z. Guo, S. Song, M. Ciocarlie. "Tactile-based object retrieval from granular media." *Autonomous Robots*, 2025. [website] [paper] [video]

[4] **X. Zhu**, D. Kimmel. "Disentangling Interpretable Cognitive Variables That Support Human Generalization via DisRNN." Workshop on Interpreting Cognition in Deep Learning Models, *NeurIPS*, 2025. [paper]

[5] J. Xu*, R. Wang*, S. Shang*, A. Chen, L. Winterbottom, T. L. Hsu, W. Chen, K. Ahmed, P. L. La Rotta, **X. Zhu**, D. M. Nilsen, J. Stein, M. Ciocarlie. "ChatEMG: Synthetic Data Generation to Control a Robotic Hand Orthosis for Stroke." *IEEE RAL*, 2025. [website] [paper] [video] [code]

[6] Y. Hu, Z. Zhang, **X. Zhu**, R. Liu, P. Wyder, H. Lipson. "Knolling Bot: Learning Robotic Object Arrangement from Tidy Demonstrations." *NeurIPS*, 2025. [paper] [video] [code]

[7] Z. Ni*, X. Deng*, C. Tai*, **X. Zhu**, Q. Xie, W. Huang, X. Wu, L. Zeng. "Grid: Scene-Graph-Based Instruction-Driven Robotic Task Planning." *IEEE/RSJ IROS*, 2024. [website] [paper] [code]

[8] A. Callahan*, E. R. Hasson*, K. Minden*, M. A. Ollis*, **X. Zhu***. "Uniquely completable and critical subsets of the integer addition table." *Australasian Journal of Combinatorics*, 2024. [paper]

RESEARCH EXPERIENCE

Robotic Perception, Interaction, and Learning Lab, Columbia University New York, NY
Undergraduate Research Lead *Sep. 2024 – Present*

- Building full-hand tactile learning system for humanoid robots (Ongoing)
- Developed visuo-tactile portable robotic gripper for fine-grained manipulation (*NeurIPS '25*)

Zuckerman Mind Brain Behavior Institute, Columbia University New York, NY
Undergraduate Research Lead *May 2024 – Present*

- Designed machine learning models for understanding human behavior and generalization (*NeurIPS CogInterp Workshop '25*)

Robotic Manipulation and Mobility Lab, Columbia University New York, NY
Undergraduate Research Lead *Nov. 2023 – May 2025*

- Created adaptive robotic orthosis control for stroke rehabilitation via sEMG signals (*IEEE RAL; second paper under review*)
- Built tactile-based robot for underground object retrieval (*Autonomous Robots Journal '25*)

Creative Machines Lab, Columbia University New York, NY
Undergraduate Research Assistant, Advisor: Prof. Hod Lipson *Nov. 2023 – Jan. 2024*

- Trained robotic system to learn tidiness through human demonstrations (*NeurIPS '25*)

Intelligent Manufacturing and Machine Vision Research Lab Shenzhen, China
Undergraduate Intern, Advisor: Prof. Long Zeng *May 2023 – Aug. 2023*

- Robotic Task Planning Using Scene Graphs and Large Language Models (*IROS '24*)

Bard Early College at Simon's Rock, Department of Mathematics Great Barrington, MA
Undergraduate Research Assistant, Advisor: Prof. Kaethe Minden *Aug. 2021 – May 2023*

- Investigated mathematical properties and applications of infinite Latin squares (*Australasian Journal of Combinatorics '24*)

LEADERSHIP EXPERIENCE

ACComPLISHED Health Education Program   Columbia University
Peer Teaching Leader; Workshop Organizer   *May 2024 – Dec. 2024*

- Co-led free summer programs for 400+ high school students worldwide [program]; hosted 2 AI/medicine workshops for 100+ and mentored 10+ students one-on-one. [media];

Engineering Student Council (ESC), Columbia University   New York, NY
Professional Development and Alumni Relations Representative (Junior)   *Sep. 2023 – May 2024*

- Built partnerships with the Columbia Engineering Young Alumni Association to launch networking events connecting students with industry professionals.

Student Government, Bard Early College at Simon's Rock   Great Barrington, MA
Class Representative (Freshman & Sophomore)   *Aug. 2021 – May 2023*

- Coordinated campus operations and logistics during COVID lockdown; led 10+ Women in STEM events, including electronics workshop [photo]
- Streamlined the student internship transportation program and collaborated with local officials to resolve community-wide transit delays.

SERVICE

Guided Training and Rehabilitation after Stroke   Columbia University
Clinical Volunteer with Dr.Syeda Naqvi   *March 2024 – Dec. 2024*

- Visited the homes of 10 stroke patients across NYC; assisted with rehabilitation exercises using motion-capture devices and designed infographics to track blood pressure progress and build patient confidence.

Manhattan Physical Medicine and Rehabilitation   New York, NY
Clinical Assistant to Dr. Loren Fishman   *May 2024 – Sep. 2024*

- Shadowed 30+ hours in rehabilitation care, assisting with patient treatment and EMG needle practice.

TEACHING EXPERIENCE

Bard Early College at Simon's Rock   Great Barrington, MA
Teaching Assistant

- Think Tank: General Engineering Tutor   **Spring 2023**
- CMPT 100: Foundations of Computer Science   *Prof. Zachary While*   **Spring 2023**
- MATH 101: Geometric Thinking and Problem Solving   *Prof. Kaethe Minden*   **Fall 2022**
- MATH 110: Algebraic Structures and Techniques   *Prof. Kaethe Minden*   **Spring 2022**

AWARDS & HONORS

Best Demo Award for Touch in the Wild, RSS 2025 Workshop on Robot Hardware-Aware Intelligence [link] (2025)

Work Exemption Grant ($6000 per term; Summer & Fall 2024 terms), Columbia University (2024)

Second Prize, John Locke Institute International Essay Competition, Theology Category [essay] [award] (2023)

First Place, Expository & **Second Place, Seminar & Personal Writing**, Leslie Sander Writing Contest, Bard College at Simon's Rock (2023)