Chris Sha

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EDUCATION

Columbia University, *Fu Foundation School of Engineering and Applied Science* New York, NY

- Bachelor of Science: Applied Mathematics; GPA: 4.20 May 2026
- Minors: Computer Science, Philosophy
- Relevant Coursework: Machine Learning, Neural Networks & Deep Learning, Modern Analysis, Parallel Optimization, Probability Theory, Linear Algebra, Partial Differential Equations

RESEARCH EXPERIENCE

Summer Intern Beijing, China

Embodied AI Lab, Beijing Academy of Artificial Intelligence June 2024 – Sep. 2024

- Developed an autonomous end-to-end vision-based humanoid robot (unitree h1) locomotion policy guided by a Video-Language-Model for various parkour tasks such as leap, squat-walking, and hurdling.
- Trained the low-level policy using Proximal Policy Optimization with an MLP as the backbone of the actor.

Undergraduate Research Assistant New York, NY

The Accessible and Accelerated Robotics Lab, Columbia University Sep. 2023 – Present

- Collaborated with 3 other lab members to conduct research on Robust Adaptive Parameter Identification (RAPId) for Underactuated Multibody Systems by constructing a new Kaczmarz-based algorithm.

Summer Intern Beijing, China

State Key Laboratory of Intelligent Control and Decision of Complex Systems, Beijing Institute of Technology June 2023 – Sep. 2023

- Designed registration, segmentation, and sample consensus algorithms for industrial parts point clouds using the Open3D library in python.
- Collaborated with 2 other lab members to research in improving point cloud registration accuracy for objects with distinguishable geometric information using their geometric features extracted by differential geometry methods.

Virtual Research Program Irvine, CA

Yale University, Department of Physics Sep. 2022 – Mar. 2023

- Advisor: Corey S. O'Hern, Professor of Mechanical Engineering & Materials Science, Physics
- Analyzed correlations between protein features of missense variants and their pathogenicity using the structural information obtained from a deep-learning protein structure prediction model NetSurfP-3.0.
- Reconstructed ProteinBERT into a machine learning model that predicts the pathogenicity of missense variants with an accuracy of 88% using a recurrent neural network.

High School Research Program Beijing, China

Beijing International Studies University, Department of Mathematics June 2022 – Mar. 2023

- Advisor: Hua Zhu, Associate Professor of Mathematics
- Learned function analysis for PDEs (e.g., Sobolev & Hilbert spaces, Lax-Milgram Theorem, variational formulation, compact operators, and finite element method).
- Analyzed the well-posedness of time-harmonic 2D Maxwell's equations that model the Transverse Magnetic Problem using variational formulation and constructed an internal approximation using the finite element method.

PUBLICATIONS

"Analysis of 2D Maxwell's equations in a time-harmonic regime", Journal of Mathematics Research, Canadian Center of Science and Education April 2023

- Publication Details: Vol. 15, No. 2, April 2023 Issue (ISSN: 1916-9809).
- DOI: 10.5539/jmr.v15n2p1.

"Analysis of Protein Structural Features Associated with Pathogenic Missense Variants", Journal of Computational Biology, Mary Ann Liebert, Inc (Under Review) Sep. 2023

ACADEMIC HONORS

***Semi-finalist*, S.-T Yau High School Science Award** Jan. 2023

- Received the Regional Second Prize, a recognition of the top 8 teams in the Mainland China region, in a global science competition sponsored by Harvard mathematics professor Shing-Tung Yau that includes more than 5800 teams from over 1200 schools.

***Academic Scholarship,* Beijing City International School** Sep. 2020 – May 2022

- Awarded a total of 140,000 RMB scholarship in G11 and G12 for demonstrating consistently high performance across all subjects.

LEADERSHIP & ACTIVITIES

Student Advisor Irvine, CA

Math Community Education Outreach Program, UC Irvine Nov. 2022 – May 2023

- Taught pre-calculus math to local students from Carr Intermediate School and provided intriguing math problems to spark their continued interests in mathematics.
- Participated in weekly coaching sessions to learn teaching strategies for middle school students.

Learning Assistant Irvine, CA

Learning Assistant for Lower-division Math Courses, Sep. 2022 – May 2023

- Enrolled in a 10-week Certified Learning Assistant Program (CLAP) to learn pedagogical theories on ways of facilitating active learning and collaborative group work.
- Assisted lectures by answering individual questions and hosted office hours and review sessions to provide additional support.

SKILLS

Programming: Java, C++, LaTeX, Python, MATLAB, CUDA

Robots: Unitree H1, Unitree H1-2, Fourier GR1, Unitree GO2