Chris Sha

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EDUCATION

Columbia University, Columbia Engineering, New York, NY Expected May 2026

B.S. in Applied Math with a minor in Computer Science (Transfer)

- Relevant Coursework: Linear Algebra, Ordinary Differential Equations, Mathematical Modeling in Biology, Intro to Programming in Java & Python

University of California, Irvine, Irvine, CA Sept. 2022 – May 2023

Mathematics Major, School of Physical Sciences; GPA 3.98

Beijing City International School, Beijing, China Sept. 2018 – May 2022

RESEARCH EXPERIENCE

State Key Laboratory of Intelligent Control and Decision of Complex Systems, Beijing Institute of Technology, *Summer Intern* June 2023 – Sept 2023

- Designed registration, segmentation, and sample consensus algorithms for industrial parts point clouds using the Open3D library in python.
- Collaborated with 3 other lab members to research in improving point cloud registration accuracy for objects with distinguishable geometric information using geometric features extracted by differential geometry methods.

Yale University, Department of Physics, *Virtual Research Program* Sept 2022 – March 2023

- Advisor: Corey S. O'Hern, Professor of Mechanical Engineering & Materials Science, Physics, Applied Physics & Graduate Program in Computational Biology & Bioinformatics
- Analyzed statistical 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.

Beijing International Studies University, Department of Mathematics,
High School Research Program Sept 2022 – March 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 Sept 2023

- Publication Details: The paper is currently under review.

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** Sept 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

University of California, Irvine, Math Community Education Outreach Program,
Student Advisor and Mentor 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.

University of California, Irvine, Learning Assistant for Lower-division Math Courses,
Learning Assistant 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

Computer: LaTeX, Python, Java, MATLAB, Biopython, 3D Data Processing (Open 3D, PCL, Cloud Compare), Microsoft (Word, Excel, PowerPoint)
Lab Instrumentations: RGB-D Camera, Six-axis Collaborative Robot