

SHIYI CHEN

Nov 2000, Chongqing, China
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EDUCATIONS AND HONORS

Johns Hopkins University

M.S.E. in Mechanical Engineering

Dec 2024

GPA: 3.83/4.00

New York University Shanghai

Sep 2019 - May 2023

B.S. in Honors Mathematics

GPA: 3.72/4.00

◦ Study away: New York

Sep 2021 - Jan 2023

◦ Honorable mention, The Mathematical Contest in Modeling

Feb 2021

◦ Deans' List for Academic Year

2021, 2022, 2023

◦ University Honors Scholars, Founders' Day Award

May 2023

HIGHLIGHTED SKILLS

- Softwares and packages: Immersed Boundary Method Adaptive Mesh Refinement (IBAMR), FEniCSx, Pytorch, MATLAB, Numpy, Intel scientific computing libraries, vim
- Math: Differential Geometry, Numerical Methods for PDE and ODE, Functional Analysis, Graduate level linear algebra

EXPERIENCE

Computational Cardiology Laboratory, with Natalia Trayanova

Jun 2024 - Present

Johns Hopkins University, Baltimore, MD

- Performed manual data curation for over 200 CT scans of patient atriums, contributed to large cardiac imaging database for identifying Left Atrial Appendage (LAA) shape category most prone to stroke risk through shape analysis and CFD simulations
- Evaluated Diffeomorphic Mapping Operator Learning (DIMON) on a potential flow problem, proposing the use of Schwartz-Christoffel mapping, which improved accuracy by two orders of magnitude compared to Large Deformation Diffeomorphic Metric Mapping (LDDMM)
- Trained a shear stress predictor for flow past bluff bodies with data generated using Immersed Boundary Method, achieved prediction time more than 100 folds faster than direct numerical simulation

Applied Math Laboratory at NYU, with Charles Peskin and Leif Ristroph

Applied Math Summer Undergraduate Research Experience, CIMS, NYC

May 2022 - Present

- Conceived and developed the research idea to create 2d and 3d MATLAB simulations of self-rotating cylinder under gravity by integrating the coupling between Fluid-Structure Interaction with rigid body dynamics, shedding light on zero drag mechanism intrigued by experimentalist
- Initiated and executed a 3D simulations of autonomous robots using IBAMR, customized C++ ConstraintIBKinematics classes to match desired kinematics in the lab, resulted in a speedup of over 20x compared to previous MATLAB simulations

Jun Zhang's lab, with Jinzi Huang

Deans' Undergraduate Research Fund, East China Normal University

Jun 2021 - Aug 2021

- Designed and built an Arduino-controlled cantilever suspension system on the optical table, quantifying the angular displacement of the candy ball with an accuracy of 0.01 degree
- Developed an image-tracking program in MATLAB to obtain data from images of laser light spots,

automated the data collection and post-processing workflow

PUBLICATIONS

Learning PDE Solution Operators via Diffeomorphic Mappings: Applications in Fluid Dynamics

Master Thesis

Diffeomorphic Latent Neural Operators for Data-Efficient Learning of Solutions to Partial Differential Equations

Zan Ahmad, **Shiyi Chen**, Minglang Yin, Avisha Kumar, Nicolas Charon, Natalia Trayanova, Mauro Maggioni

Accepted by 2025 AAAI Workshop

[arXiv:2411.18014](#)

EXTRACURRICULAR

President of Math Society, at NYU Shanghai

Sep 2020 - May 2021

- Led and coordinated a series of events, including student panels, fortnight problem-solving challenges, and seminars on advanced math topics, engaging over 30 participants
- Collaborated with board members to create a leader board for ongoing competitions, enhancing engagement among members and increasing participation by 50 % compared to covid period

English teaching volunteer, Yuanlin No.6 High School, China

Jan 2020

- Developed and implemented an English curriculum on space exploration for 10 high school students, tailoring lessons to enhance language and scientific knowledge
- Collaborated with NYU students and faculty to facilitate teaching activities over a one-week intensive program, improving student engagement by carrying out various activities such as field trip

Outdoor activities

- Hiking, Camping, Climbing, and Skateboarding