Shifan He

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Education

University of Waterloo *Sep. 2023 – Apr. 2026*

BMath in Mathematical Finance, BMath in Pure Mathematics

Relevant Topics: Data Abstraction & Algorithms, Functional Programming, Financial & Managerial Accounting, Microeconomics, Macroeconomics, Linear Algebra II

Stony Brook University *Aug. 2022 – May 2023*

BS in Applied Mathematics, BS in Physics

Relevant Topics: Linear Algebra, Differential Equations, Multivariable Calculus, Real Analysis, Applied Complex Analysis

Experience

Mathematics & Astronomy Competition Tutor *Jan. 2022 – June 2022*

Excel Academy *Long Island, NY*

- Assembled high-level curriculum for math and astrophysics, focusing on problem-solving skills
- Delivered one-on-one training sessions for abstract mathematical concepts
- Student was accepted to the 2022 Ross Mathematics Program

Data Processing & Analysis *June 2022 – July 2022*

US Earth Science Olympiad Training Camp *Virtual*

- Extracted and processed various climate-related datasets, including hydrologic data, time series from GPS sites, seismograms, etc.
- Applied machine learning and other computational models to geologic data

R&D Assistant *Oct. 2021 – Jan. 2022*

Corenics Microelectronics Inc. *Virtual; Chengdu*

- Assisted in the checking of photomask design under guidance of mask design engineers and participated in patent literature survey
- Ran power electronics device simulation software (Sentaurus 2018) under guidance of simulation engineer

Accomplishments

- Accepted to **Ross Mathematics Program** (~15% Acceptance Rate) *2021*
- Accepted to **MathILY Program** (~10% Acceptance Rate) *2021*
- 4x Qualifer, with AIME scores in top 10%, **American Invitational Mathematics Exam** *2019-2022*
- 15th Team in Algorithmic Trading, **Rotman International Trading Competition** *2023*
- 29th in USA, **USA Astronomy and Astrophysics Olympiad** *2022*
- 2x Invited to National Program for **US Earth Science Olympiad** (Top 40 in USA) *2021-2022*
- Qualified for **USA Physics Olympiad** (Top 200 in USA) *2021*

Projects

Rayleigh Scattering Model for Apparent Moon Coloration (Python) *2021-2022*

- Modeled extinction of moonlight through Earth's atmosphere to output visual color predictions, which were then compared to real moon photos
- Constructed model and wrote program to convert a light frequency intensity spectrum to an RGB value for output

FGMmr2 (C++, CMake) *2023-current*

- Built a physics engine to simulate the relative motion of massive bodies in C++
- Simulates two-body problem with high resolution and frequency using explicit Runge-Kutta methods

Skills

Programming Languages: Python, R, C/C++, Java, JavaScript, Racket, Bash, SQL, HTML/CSS

Tools: Linux, NumPy, Git, Excel, Pandas, PostgreSQL, GraphQL, CMake, MatPlotLib, LaTeX/Typst

Summary

- Exceptional problem-solving and abstract thinking skills
- Ability to apply mathematical knowledge to real-world concepts via modeling and simulation
- Ability to effectively explain and communicate advanced ideas and mathematical reasoning with others
- Experience working in teams and collaborating on high-level quantitative projects within strict deadlines
- Native speaker of both English and Mandarin Chinese, fluent in Spanish