Fred Yuan

115 Fallstone Drive, Lake Forest, 60045
224-544-0496 fryuan@iu.edu linkedin.com/in/fredrichyuan personal website

Education

Indiana University **Aug. 2022 – May 2026**
Bachelor of Science in Applied Math, Bachelor of Science in Finance *Bloomington, Indiana*

Relevant Coursework

- Data Structures
- Mathematics in Finance
- Modern Algebra
- Measure Theory
- Differential Equations
- Multivariable Calculus
- Machine Learning
- Probability and Stats

Experience

Lab of Geometry **June 2024 – Present**
Probability Research Intern *Bloomington, Indiana*

- Developing a novel neural network structure to approximate parameters of stochastic volatility via rough path theory
- Working through "Stochastic Calculus for Finance II" by Shreve and a primer on Stochastic Differential Equations

Chesselect **May 2022 – Present**
Founder *Chicago, Illinois*

- Leveraged 10+ years of competitive chess to help students develop critical thinking and long-term planning skills
- Performed outreach to elementary school students by reaching out to various schools and local communities to foster a welcoming and empowering environment for students to gain exposure and learn chess fundamentals
- Developed a chess UI through python's pytorch to set up impossible positions for younger students to play on
- Recruited our teaching staff to 4 players to accommodate 30+ new students

Projects

Percolation Cluster Simulation | *Python, pandas, matplotlib* **June 2024**

- Developed a grid-based percolation model, simulating random walks across nodes connected by probability thresholds
- Gathered simulation data over p values over the interval (0,1) to gain insights on the distribution of expected time based around manhattan distance and how this expected time changes through linearly-scaled grid size and dimensions
- Visualized the percolation process using matplotlib, demonstrating critical threshold behaviors at $p = 0.5$, which allowed identification of optimal connectivity for efficient traversal in random walk simulations

SDE Presentation | *SDE's, Ito's Lemma, Black-Scholes* **April 2024**

- Worked through sections of Probability Theory (Durrett) and SDE's (Evans) to understand how to measure randomness
- Presented Martingales + Derivation of Itö's lemma and their applications to laymen audiences with mentor Max N
- Modeled and simulated solution's to SDE's through python matplotlib to give visual aid and verification of Itö's lemma

Leadership / Extracurriculars

Chess Club **Fall 2022 – Present**
President *Indiana University*

- Raised $7000 from school and local organizations to send members to national tournaments like PANAM and USAT.
- Arranged and set up weekly USCF-rated tournaments for local players, consisting of over 100+ players
- Collaborated with local colleges to attend and host intercollegiate competitions for the first time in the club's history
- Performed outreach to GMs, IMs, and other titled players, successfully securing 5 titled players to give lectures

IU Squash Club **Fall 2022 – Present**
Co-President *Indiana University*

- Developed and implemented drills to enhance team skills and strategy, helping our team jump from division 5 to 3
- Represent IU at the #2 spot on the roster during yearly tournaments, including placing 5th in div 3 Squash Nationals
- Coordinated with midwestern colleges like Dennison, Purdue, and CMU to arrange matches to qualify for nationals

Skills & Interests

Languages: Python, Java, React, HTML/CSS, JavaScript, SQL, Microsoft Access
Honors & Awards: TFT Challenger, HS BG's Top 200, 3x AIME, 2x Ambassador Award, 2nd @ Deloitte Data Challenge
Interests: TFT Challenger & Streamer, 2000 USCF Rating, Raising Chickens, PSA Squash, Math Content Creator