Bradley Moon

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Education

Stanford University, Stanford CA **Sep. 2021 – Jun. 2026**

Bachelors in Mathematics with Honors *GPA: 3.87/4*

Masters in Computer Science (expected)

Stanford Association for Computing Machinery **May 2022 – May 2024**

Vice-President, Puzzle Hunt Co-Chair *Stanford CA*

- Assisted with presidential duties, development of the annual puzzle hunt, and administrative duties.
- Organized and ran the 2023 Stanford ACM fall puzzle hunt, the largest hunt in Stanford history.
- Duties include managing and contributing to puzzle writing, organizing meetings, and communicating with sponsors.

Publications and Projects

Is Momentum Trading Dead? | *Link to code* **Jun. 2024**

- We used convex optimization to investigate momentum-inspired trading techniques and evaluate their performance.
- We compared three different models: naive momentum, CAPM, and lastly a hybrid model.
- Shockingly, we found that the risk-return trade-off was inverted for CAPM and best for simple momentum.

Integrating Extra Linguistic Meaning into the BERT Framework | *Link to code* **Jun. 2024**

- We aimed to improve BERT's performance on NLI tasks by integrating additional linguistic meanings.
- We took presuppositions and implicatures together with BERT's encodings using concatenation, adding, and SVD.
- We found only limited improvement on sarcasm and inference tasks and slight improvement in sentiment analysis

DEEPNETS - Machine Learning to Predict Composer Name from Audio Files | *Link to code* **Mar. 2024**

- We trained a machine learning model that differentiates between and classifies classical music by composer.
- We cast this as a multiclass classification problem, with WAV audio files as inputs and a composer as an output.
- We found potential for success with classification but were unable to improve past 70% accuracy due to insufficient data

A Majority Voting Model on Branching Brownian Motion | *Link to paper* **Aug. 2022**

- We generalized a result on the behavior of the Allen - Cahn Equation to a larger family of PDEs.
- Paper published through SURIM.

Experience

Stanford Department of Chemistry **Dec. 2023 – (current)**

Research Assistant, advised by Professor James Chen *Stanford CA*

- Currently studying HIPK4 function for spermatogensis in mouse spermatocytes for non-hormonal male contraception.
- Skills used include CRISPR/cas9 gene editing, cell culturing, and ribosome profiling.

Stanford Department of Biology **Oct. 2022 – Sep. 2023**

Research Assistant, advised by Professor Noah Rosenberg *Stanford CA*

- Studied properties of Shannon Entropy on discrete allele spaces with fixed maxima.
- Primary techniques involve majorization and utilizing Schur-convex criteria.

Stanford Department of Mathematics **Oct. 2022 – (current)**

Course Grader *Stanford CA*

- Graded homework and provided hints and solutions for students in Stanford math courses.
- Courses graded: Math 60s Discrete Methods Series, Math 113 Linear Algebra, Math 147 Differential Topology.

Awards and Scholarships

Mathematics

- Top 300 in Putnam National College Math Exam
- Two-time American Invitational Math Exam qualification
- American Math Competition Distinction Honor Roll

Scholarships and Honors

- National Merit Scholarship Recipient
- Presidential Scholar Candidate
- Michael J. Libow Scholarship Recipient

Personal Section

Skills: - French: conversational fluencey
- Languages: C, C++, Python, numpy, pandas, pytorch, tensor flow, cvxpy

Hobbies: - Piano (17 years' experience, exploited accompanist for friends),
- Viola (10 years' experience, Principal of Stanford Symphony and violist in the BAJA quartet!),
- Dance (11 years' experience, mostly ballet, dancer in Cardinal Ballet Company and Stanford Innovative Styles),
- Puzzle enthusiast (enjoyer of the NYT games and puzzling stack exchange)