Milo Knell

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Education

Harvey Mudd College   *Aug 2021 – May 2025*

3.85 major GPA. B.S Computer Science and Math, concentration in economics. Member of poker club and co-founder of games club

Sequoyah High School   *Sep 2017 – Jun 2021*

4.0 GPA. Leader of STEM institute, school treasurer, honor board rep, member of archery team, member of flag football team

Experience

Theoretical Computer Science Researcher at AMISTAD Lab   *May 2022 – Jul 2022*

Prof. George Montanez at Harvey Mudd College, theoretical machine learning   *Claremont, CA*

- Proved generalization of prior theorems to act on a continuous space that better models machine learning problems. Proved bounds on when transfer learning succeeds and the fundamental tradeoff between transfer success and algorithmic rigidity. Proved novel bounds on the minimization of regret for the exploitation-exploration tradeoff in reinforcement learning.

Software Engineer Intern at THN Studio   *Jan 2022 – Mar 2022*

- Created machine learning pipeline to annotate stock photos with tags to improve searchability. Created backend to handle remote photo submission and facilitate tagging with Django and MySQL. Created web crawler using Selenium.

Mathematics Researcher at Backgammon Research Group   *Nov 2021 – May 2022*

Prof. Arthur Benjamin at Harvey Mudd College, combinatorics and game theory   *Claremont, CA*

- Optimized play for Backgammon. Created 3x improvement in state of the art for predicting optimal doubling cube actions

Founder at Keous   *May 2019 – Aug 2021*

- Nonprofit that presents political news articles on the same topic with different perspectives to reduce political polarization.
- Created state of the art machine learning model using triplet loss between headline and body texts with a strong increase over prior work in macro f1 (from 80% to 94%) in targeted sentiment analysis. Paper currently under review for publication.
- Created distributed prediction system and storage on Google Cloud Platform, linking results to be displayed online.

Physics Researcher at Cataclysmic Variable Stars Research Group   *Jan 2019 – May 2020*

Prof. Joe Patterson at Columbia University, astrophysics and cosmology   *Remote*

- Developed data pipeline to take 20 years of original data about cataclysmic variable star system BH- Lyn and apply Fourier transformations to find superhump period, then produce O-C diagram based on minimizing entropy in sliding window

Awards

Citadel's TERMINAL Global Championship invitational – 4th place and $5,000 prize   *Jun 2022*

Harvey S Mudd Merit Scholar   *Aug 2021 – May 2025*

Citadel's West Coast Regional Datathon **–** 1st place and $10,000 prize   *Sep 2021*

Dean's List at Harvey Mudd College   *Jun 2022*

Sequoyah Annual Science Symposium – 1st place poster out of 100+   *May 2020*

Projects

Citadel's TERMINAL –Created algorithm which won 4th place at globals. Designed banking heuristic and attack simulator [[news story](#)]

NLP clickbait – 1st place report at Citadel's Datathon which detects clickbait and shows sensitivity to editorial practices [[our report](#)] [[news story](#)]

AI Shopping Assistant – Created assistant to help buyers make informed decisions on platforms like Amazon. Plan to deploy as browser extension

Durak RL – Created a reinforcement learning algorithm for the traditional Russian card game Durak using Deep Q Learning in Pytorch

Asteroid Deflection – 1st place poster on kinetic and nuclear methods for deflecting hazardous asteroids, proposed asteroid mining alterative

Skills

Languages   Python   Java   Racket   HTML/CSS

Frameworks   NumPy   Pandas   PyTorch   Scikit-Learn   LaTeX   Quiskit   statsmodels