

# Milo Knell

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## Education

### Harvey Mudd College

Aug 2021 – May 2025

4.0 major GPA. B.S Computer Science, 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, 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 models machine learning problems. Proved when transfer learning succeeds and the tradeoff between transfer success and algorithmic rigidity. Proved 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. Built backend to handle remote photo submission and facilitate tagging with Django and MySQL. Made 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 doubling cube actions

### Physics Researcher at Cataclysmic Variable Stars Research Group

Jan 2019 – May 2020

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

*Remote*

- Developed 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 – 4<sup>th</sup> place and \$5,000 prize

Jun 2022

*Designed banking heuristic to determine when to save vs when to attack, and attack simulator to compute optimal placement for units. [\[story\]](#)*

Harvey S Mudd Merit Scholar

Aug 2021 – May 2025

Citadel's West Coast Regional Datathon – 1<sup>st</sup> place and \$10,000 prize

Sep 2021

*Created clickbait detector, trained on a fake news dataset to detect language that drives vitality. Sensitive to editorial practice. [\[report\]](#) [\[story\]](#)*

Dean's List at Harvey Mudd College

Jun 2022

Sequoyah Annual Science Symposium – 1<sup>st</sup> place poster out of 100+

May 2020

*Poster on kinetic and nuclear methods for deflecting potentially hazardous asteroids near Earth, including asteroid mining alternatives*

## Projects

*Keous (NLP Media Bias Mitigation)* – Created process to extract political news articles on the same topic with opposing perspectives using novel machine learning algorithms, with a 17% increase in micro F1 over prior work in targeted sentiment analysis. Built distributed prediction system using Google Cloud Platform. Registered CA nonprofit. [\[paper\]](#)

*AI Shopping Assistant* – Built shopping assistant to help buyers make informed decisions on platforms like Amazon or Walmart.

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

## Skills

**Languages**  Python  Java  Racket  HTML/CSS

**Frameworks**  NumPy  Pandas  PyTorch  Scikit-Learn  LaTeX  GCP  Django