Hope Neveux

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Education

Marist College | 2018 - 2022
Advisors: Dr. Matthew Glomski, Dr. James Helmreich

- *Summa Cum Laude* B.S in Applied Mathematics, Data Science & Analytics
- Double Concentration in Computer Science and Actuarial Science
- Overall GPA: 3.918 / 4.0

Harvard University | 2022 - 2024
Advisor: Dr. Weiwei Pan

- S.M in Data Science
- Overall GPA: 3.835 / 4.0

Research Experience

Real-time Physiological Predictors for Mental Health from Wearable Sensor Data
Cambridge, MA
Harvard University Nock Lab | Student Researcher
Sep 2023 - Present
Advisors: Dr. Kelly Zuromski, Dr. Kate Bently, Dr. Adam Bear, Dr. Yaniv Yacoby

- Utilizing bioinformation from wearables to understand and predict suicidal behavior before it occurs to hasten intervention and obviate need for invasive Ecologically Momentary Assessments
- Process raw accelerometer data to infer physical activity and sleep cycles for multi-month, multi-patient information and model suicide urge and intent using mixed effects and general time-series approaches

Responsible AI Researcher
Remote
Google | Graduate Student Researcher (Under NDA)
Jun 2023 - Present
Advisor: Dr. Femi Olanubi

- Headed R&D project development with support of an interdisciplinary doctoral team for from-scratch construction of a human-computer interaction system centered around fairness
- Designed a new framework and algorithmic process to equitably represent people based on subjective human perception rooted in extensive literature review, external stakeholder focus-groups, and hidden within collective crowdsource annotation
- Creatively designed survey methodology and questioning to mitigate social psychological pitfalls and incorporated preventative measures for known intersectional issues into system design

Adaptive Infection Simulator
Poughkeepsie, NY
Marist College Department of Computer Science | Independent Student Researcher
Apr 2021 - Apr 2022
Advisor: Dr. Alan Labouseur

- Analyzed a simulated representation of pooled testing methods for epidemiological tracking, balancing minimization of false negatives and test usage through Bayesian methods given user-defined population, disease prevalence, testing sensitivity and specificity, number of stages, and starting pool size
- Comparing results to data from testing protocols performed by the university during the 2020-2021 academic year, uncovering flaws in real detection and estimating likely false negatives

Markov (Chains & Abstract Strategy) Games
Remote
PolyMath Jr. | Undergraduate Researcher
Jun 2021 - Aug 2021
Advisor: Dr. Johanna Franklin

- Expanded upon sparse literature covering traditional games Tapatan and Picaria through strategic analysis and design via abstract algebra, learning algorithms, combinatorics, and markov chain monte carlo methods
- Proved and built guaranteed win strategy for Tapatan, disproved extant guaranteed win strategy for Picaria, and expanded games to new abstractions
- Independently manage personal work related to specific sub-team goals in overall project goals, participated in regular meetings involving cross-team work, planning, paper editing, presentation preparation, experimentation, and focus-groups

Publications

Analyses of Tapatan and Picaria | PolyMath Jr.
In Preparation
Advisor: Dr. Johanna Franklin

Analyses of Tapatan and Picaria, A. G. Adams, L. P. Arceneaux, H. Benham, A. Bhartari; M. Cruz-Larios, Q. Dong, L. F. Estrada, J. Franklin, A. Gangal, Z. J. Hercher, K. J. Martindale, **H. G. Neveux**, Y. Qiu, X. Shi, M. S. Sun, M. W. Sunseri, H. Tiwari, H. Verma, W. Wang, E. Worrell, and J. Wu

Invited & Given Talks

Higher Education's Response to COVID-19 — Sep 2022
Explorations in Social Justice Conference | Invited Panelist

Covid on Campus: Simulating the Testing & Testing the Simulation — Apr 2022
New York Celebration of Women in Computing | Talk by Dr. Alan Labouseur, Hope Neveux

- Talk covering the goals, design choices, results, and implications of the simulation vs real results of the Marist College COVID monitoring protocol during the 2020 - 2021 academic cycle

Analyses of Tapatan and Picaria
Marist College REU Panel | Talk by Hope Neveux — Mar 2022
Nebraska Conference for Undergraduate Women in Mathematics | Poster Session by Hope Neveux, Jingyi Wu — Feb 2022
PolyMath Jr. Conference | Talk by Luke Arceneaux, Luisa Estrada, Hope Neveux — Aug 2021

- Condensed presentation on general definitions, win rates, optimal strategies, board symmetries and generalizations, and game variations for research completed during the duration of the official PolyMath Jr. program in Markov (Chains & Abstract Strategy) Games

Professional Experience

Responsible AI Researcher | Google (Under NDA) — Remote, Jun 2023 - Present

- Visiting student researcher in responsible AI working to improve existing technological systems for social good with experts and stakeholders in computer science, social psychology, and sociology

3D Printing Core Student Specialist | Harvard University Science Operations — Allston, MA, Sep 2022 - Present

- Support the School of Engineering and Applied Science in the fabrication of custom, high-quality PhD and PI research parts in-house for Harvard labs and affiliates for uses such as device encasements, brain scan models, microfluidics, and biodesign
- Prime, run, process, and finish parts in resin (flexible and rigid), nylon-12 (powder), and PLA (plastics) on industry printers using custom settings and processes for efficiency, intended use, and overall precision

40 Sales Associate | Paperstore LLC — Concord, NH, Oct 2016 - Jan 2020
Original Title: Sales Associate, Promoted Sep 2017

- Floor associate responsible for building, maintaining, and promoting a brand section alongside store maintenance tasks
- On-boarded and trained seasonal employees, selectively responsible for performing returns, periodically managed floor section assignments and customer engagement, ran register assignments, performed restocks, frequently scheduled for closing

Teaching Experience

Section Mentor | Veritas AI — Remote, Mar 2023 - Present

- Assisted teaching 3 cohorts of approximately 30 highschool students topics of python from basic data science methods to SOTA models and computer vision
- Compiled supplementary material based on the backgrounds of the students to facilitate the use and learning of critical modeling tools and techniques
- Advised a course project for a subgroup of the cohort from scratch to presentation of real-life problems

Head Mathematics Tutor | Marist College Department of Mathematics — Poughkeepsie, NY, Sep 2020 - May 2022
Original Title: Mathematics Tutor, Promoted in Jul 2021

- Re-taught lectures material, reviewed and corrected quizzes and exams, assisted with homework, and worked through examples pertaining to course and instructor style for all 10 foundational courses, 1 upper-level elective, and 2 upper-level special topics
- Handled visitation tracking, tutor scheduling and coverage, took on all large groups, and stepped in when requested by other tutors

Projects

Human Malaria Detection | Harvard University, Data Science II — Spring 2023
Presentation by Hope Neveux, Michael Sam, Abigail Kinaro, Kimberly Llajurna, Emilia Mazzolenis

- Investigating fine-tuned SOTA models and few-layer convolutional networks for computer-vision-based malaria detection coupled with custom hue and saturation alterations

Cosmological Effects on Seismic Plate Shifting | Harvard University, Data Science I — Fall 2022
Paper and Presentation by Hope Neveux, Audrey Watkins, Haoran Zhang

- Implemented bagged regressions, standardized ridges, boosted trees, and time series models to predict earthquake magnitude and prevalence with traditionally available data and web-scrapped tidal data

bAD Package | Harvard University, Systems Development for Computational Science — Fall 2022
Package and Presentation by Hope Neveux, Dahnee Kim, Jack Sheehan, Annabel Yim

- Developed a forward and reverse auto-differentiation Python API from scratch including test suite, documentation, and a flexible interface. Published on the Python Package Test Index

Dolly Parton | Harvard University, Data Visualization — Fall 2022
Website and GitHub by Hope Neveux, Isidora Diaz, Loralee Ryan

- Storybook-like bibliographic website featuring the life, career, and philanthropy of Dolly Parton, developed entirely in HTML, CSS, JS, and Bootstrap

Screening the Media: Detecting Fraudulent Journalism | Marist College, Data Science Capstone — Spring 2022
Paper and Presentation by Hope Neveux, Kaden Beck

- Experimental NLP application contrasting custom naive approaches with valence-aware sentiment analysis to investigate feasibility of machine learning based news-screeners utilizing various data sources

Twin Primes & The Twin Prime Conjecture | Marist College, Mathematics Capstone — Spring 2022
Paper and Presentation by Hope Neveux, Reece Bartolini, Emily Mohre

- A chronological account of the progress addressing the mathematical concept of twin primes and the elusive Twin Prime Conjecture, from 1826 to 2014, written as a textbook chapter and presented as a full lecture

Investigating Interstellar Light | Marist College, Machine Learning — Fall 2021
Paper and Presentation by Hope Neveux, Kaden Beck

- Paper investigating the feasibility of machine learning for detecting pulsars from neutron candidates characterized by statistics on the integrated pulsar profile, relation in the amount of signal smearing, and general interference based on data used in R. J. Lyon's *Why Are Pulsars Hard to Find*

Heat Conduction in an Insulated Steel Rod: Numerical | Marist College, Partial Differential Equations — Spring 2021
Paper by Hope Neveux, Jake Zukaitis

- Exploratory project to modify basic heat conductance PDEs to better match real life measurements of heat diffusion under a specific circumstance

Evolution of Music Over Four Modern Decades | Marist College, Data Mining & Predictive Analytics — Spring 2021
Paper and Presentation by Hope Neveux, Emily Mohre, Amanda Poor

- Employing feature selection, engineering, and appropriate architectures to create popular song profiles by identify prominent musical attributes associated with chart performance from 1980 - 2020 by decade

Anthropogenic Effects on Stream pH | Marist College, Bayesian Analysis — Fall 2020
Paper by Hope Neveux, Camille Renaud

- Paper investigating conclusion differences of Bayesian vs frequentist analyses of local water quality study examining anthropogenic effects on fluvial systems

Awards & Recognition

Pi Mu Epsilon | Marist College — Since Mar 2022

- Nomination by multiple faculty given excellence in foundational and advanced mathematics in pursuit of a major with maintained GPA of at least 3.0
- Inducted to the U.S. Honorary National Mathematics Society in 2022 in a cohort of 8 students out of a department of approximately 75

Alpha Chi | Marist College — Since Feb 2022

- Elected for induction by faculty due to depth of academic pursuit and placement in the top 10 percent of juniors, seniors, and graduate students

IBM Datathon | Marist College — Apr 2021
2nd Place

- Competed on a 3 person team against approximately 10 others to analyze pandemic communications, presenting the divergence of mental health availability and searches / posts related to depression and anxiety
- Proposed recommendation to bolster telehealth and remote support services, which were then underutilized and inaccessible

Dr. Armand Hammer Scholarship | Marist College — Feb 2019 - May 2022
5-time Recipient

- Merit scholarship awarded annually to a single student of the college for demonstrated academic excellence and the potential to become an outstanding graduate

Dean's List | Marist College — Aug 2018 - May 2022
8-time Recipient

- Awarded every semester to students demonstrating academic excellence in the previous term, requiring a semester GPA of 3.60 and greater for a 12-credit or greater workload

Academic Merit Scholarship | Marist College — Aug 2018 - May 2022

Leadership & Outreach

Graduate Student Mentor | Harvard University — Oct 2023 - Present

- Mentor on academics, professional trajectory, and general support among 1st years within the professional graduate programs through the Graduate Advisory Committee's mentorship program
- Foster connection and belonging overall and 1-on-1 meetings at least monthly with two mentees alongside regular online communication offering emotional and academic support

Graduate Advisory Committee Webmaster & Communications Manager | Harvard University — Aug 2023 - Present

- Responsible for the design, maintenance, and distribution of the Harvard SEAS GAC website communicating our events, mission, and resources as well as monitoring student and alumni inquires

Association for Women in Mathematics Secretary | Marist College — Aug 2021 - May 2022
Advisors: Dr. Matthew Glomski, Dr. Elizabeth Reid

- Initiated correspondence for collaboration with clubs and external organizations, wrote and managed meeting notes and agendas, assisted in any capacity on all projects

Math Club President | Marist College — Aug 2021 - May 2022
Advisor: Dr. Matthew Glomski

- Corresponded with other clubs and the Department of Mathematics faculty to plan events fostering larger community, mathematics education and excitement, present research, and provide resources to succeed in academia and industry

Math Club Social Media Director | Marist College — Aug 2020 - May 2021
Advisor: Dr. Matthew Glomski

- Curate official Instagram content alongside the design and maintenance of the first official website

Skills & Interests

Programming & Programs

- Python and *Numpy, Pandas, Dask, Scipy, BeautifulSoup, Sci-kit Learn, Tensorflow, Pytorch, Matplotlib, Seaborn*
- JavaScript, HTML + CSS, React, and plugins *Bootstrap, D3*
- R and *ggplot2, dplyr*; Java, LaTeX, bash, SQL, git
- GCP, Docker, RStudio, VSCode, Jupyter, Google Colab, GitHub, Tableau, Windows OS, Mac OS, Ubuntu Linux, SPSS Modeler

Other Courses

- Digital Humanities, Elementary Japanese I, Okinawan Karate, Ethics, Introduction to Cosmology, Microsoft Excel, Modern Speculative Fiction, Philosophical Perspectives

Interests

- Archery (Barebow and Olympic Recurve); martial arts including Shaolin Kempo, Okinawan Karate, and Western Boxing; weightlifting; sci-fi; cats; skincare; minecraft; anime; learning new recipes; astrophysics and astronomy; precision medicine; data privacy and internet anonymity; patient care, accessibility, and equity