

## EDUCATION

---

**Harvey Mudd College** Claremont, CA  
*B.S., Computer Science and Mathematics, with High Distinction* *Aug. 2021 – May 2025*  

- **Major GPA:** 4.00/4.00 (**CGPA:** 3.98/4.00); Emphasis in Data Science, Concentration in Economics; Departmental Honors in Computer Science, Departmental Honors in Mathematics
- **Relevant coursework:** Mathematics of Machine learning [Graduate], Stochastic Processes & Calculus [Graduate], Neural Networks, Combinatorics, Mathematical Data Science & Topic Modeling, Probability, Real Analysis, AI Ethics

## RESEARCH EXPERIENCE

---

**ServiceNow Research** Claremont, CA  
*Contract Research Intern, Student Team Lead (Spring)* *Aug. 2024 – Jul. 2025*

**Controllable LLM-enabled Embeddings:**

- Developed and evaluated novel methods to inject custom perspectives in text embeddings requiring minimal input
- Developed flexible experiment pipeline to run and evaluate clustering performance of modified embeddings
- Explored embedding explainability techniques through space alignment methods and feature importances
- Led internal meetings and agendas for team of 6, formed research directions of publication
- Supervisors: Dr. Fabio Casati, Dr. Masoud Hashemi, Dr. Jonathan Chang (HMC Clinic Program)

**AMISTAD Lab, Harvey Mudd College** Claremont, CA  
*Undergraduate Researcher (Advisor: Dr. George D. Montañez)* *Mar. 2023 – Jul. 2025*

**Probabilistic Error Guarantees for Abductive Inference:**

- Proved two novel probabilistic error guarantees for abductive inference in machine learning tasks
- Established a general framework for selective abduction based on Bayesian Decision Theory; Incorporated results of the algorithmic search framework (ASF) to derive noise-accounting probabilistic bounds
- Led non-advisor team discussions and facilitated team communication and task organization

**Model Characterization via Inductive Orientation Vectors:**

- Introduced inductive orientation vectors as a novel model-agnostic evaluation method
- Co-developed flexible experiment pipeline quantifying information-theoretical metrics (Algorithmic Bias, Entropic Expressivity, and Algorithmic Capacity) of supervised classification models across hyperparameter ranges
- Empirically confirmed theoretical properties such as the bias-expressivity trade-off and capacity upper bounds

**Bayesian Multi-armed Bandit Modeling of Incentive Misalignments in Science:**

- Formalizing incentive misalignment problems in the research community via MAB models
- Adapted stochastic multi-armed bandit theory to construct bounds on expected regret for scientists conditional on particular incentive structures such as grant and scholarship placements
- Corroborated derived bounds with time-series analysis of Google Scholar datasets; manuscript in preparation

**Nonlinear and Complex Systems Research Group, Harvey Mudd College** Claremont, CA  
*Undergraduate Researcher (Advisor: Dr. Heather Zinn-Brooks)* *May 2022 – Dec. 2023*

**Generating opinion distributions from data using binary classification models**

- Fitted social dynamics models with Twitter datasets to study mechanics of online political polarization
- Engineered data pipeline for automated extraction, wrangling, and sentiment labeling of textual data
- Trained logistic regression and LSTM-based probabilistic classifiers for opinion estimation

## ACADEMIC AWARDS AND HONORS

---

CRA Outstanding Undergraduate Researcher Award, *Computing Research Association* 2025  

- Recognized as one of 8 undergraduate awardees across North America for outstanding potential in CS research

“Class of ‘94” Award, *HMC Department of Computer Science* 2025  

- Annually recognizes top 1–3 graduates judged to have an outstanding record in coursework, research and service

Barry Goldwater Scholarship, *Barry Goldwater Scholarship and Excellence in Education Foundation* 2024  

- National merit-based scholarship recognizing outstanding undergraduates in research and academic achievement

Stavros Busenberg Prize in Applied Mathematics, *HMC Department of Mathematics* 2024  

- Annually recognizes one senior student who shows particular promise in the study of applied mathematics

Robert James Prize for Excellence in Mathematics, *HMC Department of Mathematics* 2022  

- Annually recognizes 1–3 rising sophomore student(s) for mathematics performance

Rose Hills Foundation Science & Engineering Scholarship, *Rose Hills Foundation* 2022–25  
Dean’s List, *Harvey Mudd College* 2022–25  
Pell Grant, *Federal Student Aid* 2021–25  
CAL Grant, *California Student Aid Commission* 2021–25

## PEER-REVIEWED PUBLICATIONS

---

\* Equal contribution

- [1] **Pang-Naylor, K.**, Chen, E., Montañez, G. (in press). Analyzing and Comparing Machine Learning Models via Inductive Orientation. *In International Conference on Agents and Artificial Intelligence*. Springer International Publishing.
- [2] **Pang-Naylor, K.**, Manivasagan, S., Zhong, A., Garg, M., Mondello, N., Buckner, B., Chang, J., Mahajan, K., Hashemi, M., Casati, F. (in press). Controllable Clustering with LLM-driven Embeddings. *Empirical Methods in Natural Language Processing (EMNLP 2025), Industry Track*.
- [3] **Pang-Naylor, K.**, Chen, E., Montañez, G. (2025). Model Characterization with Inductive Orientation Vectors. *International Conference on Agents and Artificial Intelligence (ICAART 2025)*. doi:10.5220/0013304400003890.
  - Selected as high-quality full paper and awarded extended oral presentation slot (25 minutes)
- [4] **Pang-Naylor, K.**, Li, I., Rajesh, K., Montañez, G. D. (2024). Probabilistic Error Guarantees for Abductive Inference. *IEEE International Conference on Future Machine Learning and Data Science (IEEE FMLDS)*. doi:10.1109/fmls63805.2024.00038.

## POSTERS & PRESENTATIONS

---

- Pang-Naylor K. “Probabilistic Error Guarantees for Abductive Inference.” Invited spotlight presentation at: Computing Research Association URA Lightning Talks (Remote), April 2025.
- Pang-Naylor K. “Model Characterization with Inductive Orientation Vectors.” Presentation at: 17th International Conference on Agents and Artificial Intelligence, Porto, Portugal, February 2025.
- Pang-Naylor K. “Probabilistic Error Guarantees for Abductive Inference.” Presentation at: 2024 IEEE International Conference on Future Machine Learning and Data Science, Sydney, Australia, November 2024.
- Pang-Naylor K. “Probabilistic Error Guarantees for Abductive Inference.” Presentation at: 2024 Gulf Coast Undergraduate Research Symposium (GCURS), Houston, Texas, November 2024.
- Pang-Naylor K. “Model Characterization with Inductive Orientation Vectors.” Invited spotlight presentation at: Pepperdine University Human-Centered AI Conference, Malibu, California, September 2024.
- Pang-Naylor K., Li I., Rajesh K., Montanez G. “Probabilistic Error Guarantees for Abductive Inference.” Poster session at: HMC Summer Research & Scholarship Poster Celebration, Claremont, California, September 2023.
- —, Poster session at: Undergraduate Research USC Poster Symposium, Los Angeles, California, July 2023.
- —, Presentation at: HMC Summer of CS Event, Claremont, California, June 2023.
- Pang-Naylor K., Zinn-Brooks H. “Twitter Generated Information Cascades.” Poster session at: HMC Summer Research & Scholarship Poster Celebration, Claremont, California, September 2022.

## TEACHING ASSISTANTSHIPS

---

Machine Learning (CS158), <i>Teaching Assistant, HMC</i>	2025
Data Structures and Program Development (CS070), <i>Teaching Assistant, HMC</i>	2024
Differential Equations (MATH082), <i>Teaching Assistant, HMC</i>	2022

## INDUSTRY EXPERIENCE

---

<b>Microsoft</b> <i>Software Engineer</i>	Redmond, WA <i>Aug. 2025 – Present</i>
<b>Microsoft</b> <i>Machine Learning Software Engineer Intern</i>	Redmond, WA <i>May 2024 – Aug. 2024</i>
<ul style="list-style-type: none"><li>• Engineered advanced auto-suggestion feature based on multi-agent LLM architecture assisted with RAG pipelines</li><li>• Performed data extraction, wrangling, and augmentation of chat data for fine-tuning; fine-tuned GPT3.5-turbo, babbage, davinci, and GPT-4 models for improved conversational etiquette</li><li>• Trained RNN and LSTM networks with chat data for low-cost auto-completion prototype</li></ul>	

## TECHNICAL SKILLS

---

**Programming Languages:** Python, C#, C, C++, Java, R, C, Haskell, MATLAB

**Frameworks / Libraries:** Autogen, LangChain, LangGraph, Azure OpenAI Service, Scikit-learn, Pytorch, TensorFlow, NLTK, SpaCy, NumPy, Pandas