

Maya Pal Gambhir
gambhirm@seas.upenn.edu | mayapalgambhir.com

EDUCATION

University of Pennsylvania | School of Engineering

Philadelphia, PA
Expected May 2026

Rachleff Scholar

- BSE in Artificial Intelligence
- Cumulative GPA: 3.87/4
- Coursework: Theory of Machine Learning, Learning with Conditional Guarantees, Convex Optimization, Applied Machine Learning, Natural Language Processing, Ethical Algorithm Design, Algorithmic Game Theory

RESEARCH EXPERIENCE

Synthetic Data Generation for Sortition Algorithms | *In Progress*
Undergraduate Thesis With Prof. Surbhi Goel (UPenn) and Prof. Bailey Flanigan (MIT)

Near-Optimal Dropout-Robust Sortition | *AISTATS 2026 (Spotlight)*

Maya Gambhir, Bailey Flanigan (MIT), Aaron Roth (UPenn)

- Proposed a minimax optimization algorithm for selecting representative panels robust to dropouts.
- Proved low-regret convergence to the optimal value with high probability for sampled panels.
- Implemented and evaluated algorithmic model with real world data

Conformal Language Model Reasoning with Coherent Factuality | *ICLR 2025 (Poster)*

Maxon Rubin-Toles* (Harvard), Maya Gambhir*, Keshav Ramji (IBM), Aaron Roth (UPenn), Surbhi Goel (UPenn)

*denotes equal contribution

- Developed a novel scoring mechanism accounting for inter-claim dependencies, optimizing correctness and coherence.
- Proved theoretical guarantees of correctness on outputs from a novel post processing algorithms
- Achieved 90% factuality while retaining 80% or more of the original model outputs
- **NeurIPS 2024 Workshop** in Statistics for LLMs; **ICLR 2025**.

Emotion Prediction for News Data | 2023

UPenn Computational Social Science Lab

- Used the ChatGPT API and other machine learning models to evaluate sentiment on news data
- Iteratively adjusted API calls for effective quote extraction and plotted various error rates.
- Provided weekly code updates, collaborated to debug and improve model performance.

WORK EXPERIENCE

Teaching Assistant, **CIS 5230: Ethical Algorithm Design** | *January 2026 - May 2026*

Teaching Assistant, **CIS 3333: Mathematics of Machine Learning** | *August 2025 - December 2025*

Teaching Assistant, **CIS 1600: Mathematical Foundations of CS** | *June 2025 - August 2025*

Data Engineering Intern, Munich Re | *June 2023 – August 2023* | New York City, NY

- Built a new React-based frontend for an insurance estimation API.

- Created comprehensive technical documentation and implemented testing for production readiness.

PROJECTS

Reinforcement Learning with Human Feedback Literature Review | 2025

- Surveyed recent advances in preference aggregation (axiomatic, diversity-aware, etc.) for RLHF.
- Proposed structured frameworks for robust and fairness-aware subpopulation reward modeling.

Noise Level Guarantees in MCPT via Conformal Prediction Methods | 2024

- Conducted a comprehensive literature review on Monte Carlo Path Tracing, the Rendering Equation, and conformal prediction techniques
- Synthesized findings and the proposed algorithm into a ten-page research paper.
- Proposed an algorithm to guarantee low noise levels in Monte Carlo Path Tracing simulations, optimizing sample efficiency to address computational constraints.

Movie Review Sentiment Analysis | 2023

- Preprocessed IMDb review data using PCA, TfidfVectorizer, and WordNet lemmatization.
- Trained AdaBoost models with logistic regression and decision trees; built and tuned PyTorch neural networks.
- Visualized training performance across architectures and hyperparameters..

LEADERSHIP

President, Penn Six Comedy Acapella | *May 2023 – Present*

- Designed and implemented a novel collaborative structure for recruitment, rehearsal, and show production tailored to the group's no-audition model.
- Fostered a creative, feedback-driven environment to improve music performance, comedy writing, and group cohesion.

FELLOWSHIPS/AWARDS

2025 CRA Undergraduate Research Award, Honorable Mention

Rachleff Scholars Program, University of Pennsylvania

- Selected as one of a small cohort of Penn Engineering undergraduates
- 10-week paid summer research fellowship under Penn faculty mentorship
- Two honors/graduate-level courses in engineering research and inquiry

TECHNICAL SKILLS

Libraries/Tools: PyTorch, cvxpy, JAX, scikit-learn, ChatGPT API,

Programming Languages: Python, Java, SQL, Javascript/Typescript, Ocaml

Statistics/Theory: PAC Learning/Convergence, Boosting, Gradient Descent, Mean/Quantile Calibration/Multicalibration, Conformal Prediction