

ROHAN GUMASTE

805 W. Green Street, Urbana, IL 61801

☎ 408-722-8231

✉ gumaste2@illinois.edu

🌐 [linkedin.com/in/rgumaste](https://www.linkedin.com/in/rgumaste)

🔗 rohangumaste.github.io

Education

University of Illinois at Urbana Champaign (GPA: 3.92/4.00)

Sep. 2021 – May 2025 [Expected]

Bachelor of Science in Statistics & Computer Science

Urbana, IL

Cupertino High School (GPA: 4.00/4.00)

August 2017 – May 2021

Salutatorian: Rank 2/531

Cupertino, CA

Relevant Coursework

- Artificial Intelligence
- Deep Learning for Computer Vision
- Unsupervised Learning
- Applied Bayesian Analysis
- Statistical Modeling (I & II)
- Statistics and Probability (I & II)
- Text Information Systems
- Programming Languages and Compilers
- Numerical Methods I
- Introduction to Algorithms and Models of Computation
- System Programming
- Computer Architecture
- Data Structures and Algorithms
- Computational Linear Algebra
- Discrete Structures

Papers & Invited Talks

* Denotes Equal Contribution.

- [1] Ugare, S., **Gumaste, R.**, Suresh, T., Singh, G., & Misailovic, S. (2024). IterGen: Iterative structured LLM generation. Under Review. (arXiv:2410.07295)
- [2] Xu, Y.*, Zhu, D.*, **Gumaste, R.**, & Singh, G. (2024). Optimal Reward Labeling: Bridging Offline Preference and Reward-Based Reinforcement Learning. Under Review. (arXiv:2406.10445.)
- [3] Xu, Y.*, **Gumaste, R.***, & Singh, G. (2024). Reward Poisoning Attack Against Offline Reinforcement Learning. Under Review. (arXiv:2402.09695.)
- [4] Xu, Y., Suresh, T., **Gumaste, R.**, Zhu, D., Li, R., Wang, Z., Jiang, H., Tang, X., Yin, Q., Cheng, M. X., Zeng, Q., Zhang, C., & Singh, G. (2024). Two-step offline preference-based reinforcement learning with constrained actions. Under Review.
- [5] **Gumaste, R.**, & Ries, D. (2023). Comparing covariance structures of log Gaussian Cox processes applied to lightning strike data. Talk at UIUC Statistics URES Symposium.

Research Experience

Formally Certified Automation and Learning (FOCAL) Laboratory

May 2023 – Present

Undergraduate Research Assistant

Urbana, IL

- **Research Focus:** Vulnerabilities in deep offline reinforcement learning. Efficiently pessimistic learning in RLHF. Reward Modeling in offline PBRL.
- **Advisor:** Professor Gagandeep Singh
- Developed, implemented, and deployed a novel attack strategy leveraging weaknesses in pessimistic evaluation.
- Developed the iterative method for multiple different good policy generation. Implemented methods to check generated policy differences.
- Tested and fine-tuned poisoned reward function against baseline attack strategy. Resulted in out-performing baseline attack in every algorithm/dataset combination tested.
- Helped develop and test the ORL method for offline PBRL training.

Approximate and Resilient Computing (ARC) Laboratory

April 2024 – Present

Undergraduate Research Assistant

Urbana, IL

- **Research Focus:** Constrained LLM decoding. Applications in: translation to first-order logic programs, corrective code generation, and model alignment/safety.
- **Advisor:** Professor Sasa Misailovic

- Constrained, grammar aligned decoding for translation from natural language to Prover9 first-order logic programs.
- Built custom arity checker to detect model errors mid-generation.
- Designed and implemented strategies that facilitate iterative grammar-aligned generation, enhancing the efficiency and accuracy of code generation tasks.
- Developed and implemented evaluation strategies to analyze the potential privacy leakage of email data in LLMs. Resulted in near 100% leakage prevention.

Sandia National Laboratories

August 2023 – Present

Undergraduate Research Intern

Albuquerque, NM [Remote]

- **Research Focus:** Near real time lightning strike prediction using statistical and deep neural models.
- **Advisor:** Dr. Daniel Ries
- Building spatio-temporal point process models along with custom deep neural architectures for lightning prediction.
- Using custom designed statistical models to integrate meteorological/environmental factors such as cloud height, pressure levels, etc into lightning prediction.
- Studying the effects of various candidate statistical modeling techniques such as: inhomogenous point process models, Log-Gaussian Cox processes, Neyman-Scott cluster processes, and generalized mixed effects models.

Crowd Dynamics Laboratory

August 2022 – May 2023

Undergraduate Research Assistant

Urbana, IL

- **Research Focus:** Addressing fast machine unlearning and the cold start problem in deep neural recommender systems.
- **Advisor:** Professor Hari Sundaram
- Part time research assistant focusing on applied machine learning in the context of recommender systems.
- Reviewed and implemented cutting edge recommender systems to construct baseline implementations for evaluation.
- Applied conventional deep learning and novel sharding techniques in an attempt to solve the cold start problem.
- Investigated the possibility of computational audits to generate a certificate guaranteeing that user data has been “unlearned” by the neural model.

Technical Skills

Languages: Python, R, C, C++, OCaml, STAN, Java, STAN, L^AT_EX.

ML Tools: PyTorch, TensorFlow, keras, D4RL, OpenAI-Gymnasium, Mujoco-Py, OpenCV.

Developer Tools: Git, Bash/Zsh, W&B, Valgrind, ASan/UBSan, Make.

Statistical Tools: Pandas, NumPy, SciPy, Scikit-Learn, ggplot2, SpatStat, rStan.

Test Scores

GRE Total Score: 335/340

Quantitative: 169/170

Verbal: 166/170

Analytical Writing: 5.5/6.0

Service

ICLR Reviewer - 2024

Discrete Structures CA - 2022

HackIllinois Organizer - 2022