Pracheta Amaranath *(she/her/hers)*

Amherst, MA | pboddavarama@umass.edu | +1 (413) 539-8940
LinkedIn | Website | Publications | Github

SUMMARY

Ph.D. Candidate in Computer Science at the University of Massachusetts Amherst with expertise in **causal inference, experimentation, statistical modeling, simulation** and **machine learning**. I build and evaluate machine learning systems for realworld domains including logistical networks, computational biology, healthcare and causal inference applications. I am skilled in generative modeling and probabilistic reasoning, and have collaborated with cross-functional teams in the industry (Google X, Microsoft Research, Army Research Office, and Adobe Research).

EDUCATION

University of Massachusetts Amherst — Amherst, MA
Ph.D. Candidate in Computer Science — Expected 2026
Dissertation: The Interface of Simulation and Causal Modeling (Advised by David Jensen and Peter Haas)

University of Massachusetts Amherst — Amherst, MA
M.S in Computer Science — 2018-2020

Rastreeya Vidyalaya College of Engineering — Bangalore, India
B.E in Electronics Engineering (Major: Telecommunications) — 2011-2015

SKILLS

- **Programming:** Python (expert), R, C++ (familiar), PyTorch, Tensorflow, JAX
- **Machine Learning:** Neural Networks, Generative Models (GANs, VAEs, Diffusion, Transformers), Probabilistic Programming, Time-series Modeling, Bayesian Inference, Statistics
- **Causal Inference**: Causal Bayesian Networks, Potential Outcomes, A/B Testing, Randomized Controlled Trials, Quasi-Experimental Methods, Probabilistic and Graphical Modeling
- **Simulation:** Discrete-event simulation modeling (Simpy, PySim), Simulation-based Inference
- **Systems:** Experience working on HPC clusters (Slurm), Google Cloud, AWS

EXPERIENCE

University of Massachusetts Amherst — Amherst, MA
Graduate Researcher — September 2020 – Present

- **Adobe Research:** (Mentor) Developing evaluation frameworks to quantify cost-awareness and resource efficiency in LLM-based planning algorithms
- **Science for AI Governance:** Developing theoretical foundations and empirical analyses to understand when and why LLM-generated text can be reliably detected
- **Army Research Office—DEVCOM Analysis Center:** Designed a causal, simulation model as a testbed for logistic networks and developed surrogate models enabling efficient what-if analysis for complex operational systems (P1)
- **Knowledge Discovery Lab:** Architected a Causal Dynamic Bayesian Network metamodel for complex simulations, enabling rapid interventional 'what-if' analysis and optimal action identification (P1); Developed a principled evaluation framework for causal effect estimation algorithms using simulation-based inference and generative neural networks (P2)
- **DREAM Lab:** Developed an algorithm to estimate the prevalence of multiple chronic conditions using maximum entropy, frequent itemset mining and machine learning (P3)

Microsoft Research Bengaluru, India
Visiting Scholar November 2024 – January 2025

- Investigated the use of generative methods in evaluating causal effect estimation algorithms

Google X, The Moonshot Factory Mountain View, CA
AI Resident Intern June 2023 – January 2024

- Designed and developed simulation tools to empirically evaluate the sensitivity of neural network models trained on plant RNA-seq data (Heritable Agriculture)
- Migrated a proof-of-concept research pipeline to Google Cloud, implementing automated hyperparameter optimization that achieved a 50x speedup in model selection and inference

EBSCO Information Services Ipswich, MA
Semantic Analysis and Modeling Intern May 2020 – August 2020

- Developed an algorithm to extract information of population and gender metadata from clinical text
- Improved the article classification capabilities for EBSCO's content database using topic modeling and polysemy detection

Massachusetts Dept. of Public Health Amherst, MA
Data Science for the Common Good Fellow May 2019 – August 2019

- Analyzed the impact of social determinants of health to assess risks for communities in Massachusetts

Cisco Systems (India) Bengaluru, India
Systems Engineer July 2015 – July 2018

- Responsible for solution design and testing of routing, switching, wireless, data center and network programmability for enterprise customers

SELECTED PUBLICATIONS

P1. **Pracheta Amaranath**, Peter J. Haas, David Jensen, and Sam Witty. "Causal Dynamic Bayesian Networks for Simulation Metamodeling." In 2023 Winter Simulation Conference (WSC), pp. 746-757. IEEE, 2023.

P2. **Pracheta Amaranath**, Vinitra Muralikrishan, Amit Sharma, and David Jensen. "Improving Generative Methods for Causal Evaluation via Simulation-Based Inference." To Appear in CLeaR 2026.

P3. **Pracheta Amaranath**, Ninad Khargonkar, Prasanna Srinivasan, Roshan Thaikkat, Hari Balasubramanian, Peter J. Haas. "Estimating the Prevalence of Multiple Chronic Diseases via Maximum Entropy." (In progress).

P4. Laura B. Balzer, Erica Cai, Lucas Godoy Garraza and **Pracheta Amaranath**. "Adaptive Selection of the Optimal Strategy to Improve Precision and Power in Randomized Trials." Biometrics, Volume 80, Issue 1, March (2024)

P5. Katherine Avery, Jack Kenney, **Pracheta Amaranath**, Erica Cai, and David Jensen. "Measuring Interventional Robustness in Reinforcement Learning." arXiv preprint arXiv:2209.09058 (2022).

AWARDS

- Paper on "Causal Dynamic Bayesian Networks for Simulation Metamodeling" was nominated for the **Best Theoretical Paper Award**, Winter Simulation Conference, 2023
- Awarded a "**Dissertation Proposal Writing Fellowship**", Fall 2024, Manning College of Information and Computer Sciences

- **Third-rank**, B.E., Rastreeya Vidyalaya College of Engineering, Bengaluru, 2015

CONFERENCE PRESENTATIONS

- (2023) Winter Simulation Conference (Ph.D. Colloquium): Causal Dynamic Bayesian Networks for Simulation Metamodeling
- (2021) INFORMS Annual Conference: Estimating the prevalence of Chronic Diseases using the principle of Maximum Entropy
- (2019) Women in Data Science - Central Massachusetts: Estimating Chronic Diseases using the principle of Maximum Entropy
- (2019) Data Science for the Common Good: Event Showcase (University of Massachusetts, Amherst): Assessing health risks for communities in Massachusetts (in collaboration with Mass. Dept. of Public Health and Data Science for Common Good)

LEADERSHIP AND SERVICE

- Reviewer: TMLR 2025
- Co-Founder., Voices of Data Science., University of Massachusetts Amherst
- Student Steering Committee, Researchers, Educators and Business Leaders of Massachusetts (REBLS), 2019-2020

TEACHING EXPERIENCE

University of Massachusetts Amherst Amherst, MA
Graduate Teaching Assistant

- Research Methods in Empirical Computer Science — Spring 2026
- Introduction to Simulation — Fall 2025
- Machine Learning — Spring 2023
- Programming with Data Structures — Fall 2020