

SUNAY BHAT

ML Research | Data Science | Systems Engineering

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INTEREST

I am interested in AI research and engineering roles to explore and apply the latest developments in generative and robust modeling as well as ways to increase performance in structural data or edge-compute AI applications.

EDUCATION

UNIVERSITY OF CALIFORNIA, LOS ANGELES (UCLA)
MS/PhD Electrical Engineering
2020-2024

UNIVERSITY OF TENNESSEE, KNOXVILLE (UTK)
BS Electrical Engineering
2013-2017

SKILLS

RESEARCH AREAS

- Diffusion, Energy-Based, and VAE Models
- Robust Modeling and Adversarial Defense
- Causal Generative Modeling and Causal Deep Learning
- Latent Space Transformation and Interpretability
- Reinforcement Learning for Causal Discovery
- Image and Tabular Data Modeling

LANGUAGES

- **Python** (ML and Data Science Packages)
- **SQL** (Snowflake)
- **MATLAB** (SciComp, Image Processing)
- **R** (data analysis, graph theory)
- **HTML/CSS** (Basic WebDev)
- **C++** (embedded systems)

WRITING

- Medium Research Blog
- WSJ Future View Contributor

HONORS

AWARDS

- STEM solutions policy finalist, helped draft CA state legislation (2021)
- Lockheed Martin Performance Excellence award (2018)
- UTK Varsity Tennis Team Captain (2015-2017)
- UTK Chancellor's Honors for Outstanding Academic Achievement and Scholar Athlete (2017)

COMMUNITY SERVICE

- Member of Student-Athlete Advisory Committee with 100+ hours of service
- Led Lockheed STEM Engineering Week Outreach (2018)
- Mentor and volunteer through UCLA and non-profit organizations (2020-2024)

INDUSTRY EXPERIENCE

STREET METRICS, INC.

MACHINE LEARNING RESEARCHER | 2022 - Present

- Implementing statistical processes and AI algorithms on geo-spatial temporal datasets for out-of-home advertising measurement and attribution
- Exploring predictive modeling to enable campaign planning across out-of-home transit and stationary advertising products

STREET SIMPLIFIED, LLC

MACHINE LEARNING ENGINEER | SUMMER 2022, PASADENA, CA

- Applied RNNs, Transformers, and XGBoost on a trajectory prediction model to enable real-time traffic intersection safety analytics and interventions
- Performed exploratory data-analysis and implemented data-cleaning pipeline for trajectory prediction model

LOCKHEED MARTIN - SANTA BARBARA FOCALPLANE

ELECTRO - OPTICAL SYSTEMS ENGINEER | 2017-2020, GOLETA, CA

- Lead engineer on site's largest production program manufacturing cryo-cooled, mid-wave infrared photodetector systems
- Led major R&D project to implement state-of-art detector material
- Published multiple white papers and led business unit documentation effort including materials on focal plane array process improvements, radiometric defects, system characterization methods, and image processing algorithms

ADDITIONAL EXPERIENCES

- **NANO TERRA, INC.: ELECTRICAL ENGINEERING INTERN** | SUMMER 2016
- **RED RIBBON RECRUITING, LLC: CO-FOUNDER** | 2018-2019
- **OAK RIDGE NATIONAL LABORATORY: RESEARCH INTERN** | SUMMER 2014

RESEARCH EXPERIENCE

Dept. of Electrical and Computer Engineering, UCLA | Los Angeles, CA

GRADUATE RESEARCHER AND TA | SEPT 2020 – JUNE 2024

- Developed state-of-the-art defense against train-time image classification poison attacks using Energy-Based and Diffusion generative models dynamics and released Github repositories (paper under review)
- Research and publications in novel AI architectures and methods for causal discovery, utilization of causal priors in deep learning, causal generative models, latent space interpretability, and optimization for causal models
- Seven academic quarters as a Teaching Assistant (TA) in engineering writing and ethics courses leading weekly discussions and grading for topics in technology & society
- Developed curriculum to integrate writing instruction into engineering senior design courses (*serving as TA Jan - June 2023 and 2024*)

TOP PUBLICATIONS

Bhat, S., Jiang, J., Pooladzandi, O., Branch, A., & Pottie, G. (2022). **PureGen: Universal Data Purification for Train-Time Poison Defense via Generative Model Dynamics**. *Under review for NeurIPS 2024, pre-print on arXiv*.

Jiang, J., Pooladzandi, O., Bhat, S., & Pottie, G. (2022). **Hypothesis Testing using Causal and Causal Variational Generative Models**. *NeurIPS SyntheticData4ML Workshop*, New Orleans, LA

Bhat, S., Jiang, J., Pooladzandi, O., & Pottie, G. (2022). **De-Biasing Generative Models using Counterfactual Methods**. *Information Theory and Applications Workshop*, San Diego, CA