SUNAY BHAT

ML Research | Data Science | Systems Engineering

sunaybhat1@gmail.com | www.sunaybhat.me | SunayBhat1 | Google Scholar | Los Angeles, CA

INTEREST

I am interested in fundamental AI research as well as engineering roles to apply the latest developments in generative and robust modeling, increasing performance on structural data or edge-compute, and AI applications for deep tech.

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

- Energy-Based, Diffusion, 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 on focal plane array testing and 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 STUDENT RESEARCHER | 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 (*NeurIPS 2024*)
- 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 quarters as a Teaching Assitant leading weekly discussions and grading for topics in technology, ethics, & society and developed curriculum to integrate writing instruction into engineering design courses

TOP PUBLICATIONS

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

Jiang, J., Pooladzandi, O., **Bhat, S.**, & Pottie, G. (2022). **Hypothesis Testing using Causal and Causal Variational Generative Models.** *NeuralPS 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

Pooladzandi, O., Jiang, J., **Bhat, S.**, & Pottie, G. (2023). **Towards Composable Distributions of Latent Space Augmentations** *Information Theory and Applications Workshop*, San Diego, CA