Vivek Anand

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Education

Georgia Institute of Technology — *Atlanta, GA*

PH.D. IN MACHINE LEARNING — *August 2023- Present*

- **Computational Neural Engineering Training Program Fellow** - Research fellowship (One of four funded across GT & Emory yearly)
- **President's Fellow** - Top 5% of GT ECE PhD Students

Georgia Institute of Technology — *Atlanta, GA*

M.S. IN COMPUTER SCIENCE — *August 2021- May 2023*

- Specialization: **Machine Learning**
- **Full Honors** - Every semester

The Pennsylvania State University — *University Park, PA*

B.S. (HONORS) IN COMPUTER SCIENCE AND BIOLOGY. MINOR: STATISTICS — *June 2017 - May 2021*

- **Millennium Scholar** - Research scholarship with fully funded tuition, room and board (40 students yearly)
- **Schreyer Honors Scholar** - top 2% of PSU undergraduate students

Relevant Experience

Georgia Institute of Technology (Georgia Tech) — *Atlanta, GA*

GRADUATE RESEARCH ASSISTANT - PI: PROF. CHRISTOPHER ROZELL — *August 2023 - Present*

- Building a synthetic testing framework for estimating the dimensionality for ordinal data
- Actively contributing to python package `cblearn`

Netomi Inc. — *Remote*

APPLIED AI INTERN - SUPERVISER: DR. PARTHO NATH — *May 2022 - August 2022*

- Developed novel Seeded Clustering Algorithm customer service ticket discovery reducing human intervention time by 80%
- **First in the company** to use AWS Spot Instances to reduce expenditure by as much as 70% compared to EC2.

Georgia Institute of Technology (Georgia Tech) — *Atlanta, GA*

GRADUATE RESEARCH ASSISTANT - PI: PROF. B. ADITYA PRAKASH — *October 2021 - May 2023*

- Formulated novel Hypergraph based disease model for healthcare associated infections that predicts 2xs better than graph baselines.
- Accelerated hypergraph model 40xs using sparse linear algebra and JAX.

The Pennsylvania State University (Penn State) — *University Park, PA*

UNDERGRADUATE RESEARCH ASSISTANT - PI: PROF. DANIEL KIFER — *August 2020 - April 2021*

- Accelerated adversarial robustness framework for deep neural networks by at least 9x using adaptive statistical sampling.
- Wrote framework completely from scratch in Tensorflow 2 without any reference documentation to consult.

California Institute of Technology (Caltech) — *Pasadena, CA*

SUMMER RESEARCH INTERN - PI: PROF. ADAM WIERMAN — *April 2020 - February 2021*

- Developed learning augmented energy aware heterogeneous scheduling algorithms for machine learning jobs in the cloud with theoretical guarantees.
- Evaluated algorithm performance on comprehensive test bench comprising of both real life and synthetic workflows.

Virginia Polytechnic Institute and State University (Virginia Tech) — *Blacksburg, VA*

SUMMER RESEARCH INTERN - PI: PROF. MADHAV MARATHE — *May 2018 - August 2018*

- Found optimal vaccination strategies for influenza outbreaks in Montgomery County, Virginia
- Evaluated performance on high performance computing Agent Based Model simulations

Publications

[1] **V. Anand**†, J. Cui†, J. Heavey, A. Vullikanti, and B. A. Prakash, "H^2ABM: Heterogeneous agent-based model on hypergraphs to capture group interactions," in *Proceedings of the 2024 SIAM International Conference on Data Mining (SDM)*, SIAM, 2024, To Appear.

[2] **V. Anand**, "Modelling healthcare associated infections with hypergraphs," Georgia Institute of Technology, 2023.

[3] **V. Anand**, A. Pramov, S. Vrachimis, M. Polycarpou, and C. Dovrolis, "Incremental versus optimal design of water distribution networks - the case of tree topologies," in *International Conference on Complex Networks and Their Applications*, Springer, 2023, To Appear.

[4] **V. Anand** and B. A. Prakash, "Modelling healthcare associated infections with hypergraphs," in *epiDAMIK 5.0: The 5th International workshop on Epidemiology meets Data Mining and Knowledge discovery at KDD 2022*, 2022.

[5] **V. Anand**, M. Yang, and Z. Zhao, *Mitigating filter bubbles within deep recommender systems*, 2022. DOI: 10.48550/ARXIV.2209.08180. [Online]. Available: https://arxiv.org/abs/2209.08180.

[6] Y. Su, J. Yu, **V. Anand**, and A. Wierman, "Learning-augmented energy-aware scheduling of precedence-constrained tasks," *ACM SIGMETRICS Performance Evaluation Review*, vol. 49, no. 2, pp. 3–5, 2022.

[7] **V. Anand**, "Generating certifiably adversarial robust deep neural networks with minimal prediction overhead," Pennsylvania State University, 2021.

Teaching

Teaching Assistant *Atlanta, GA*

CS-3510 Undergraduate Algorithms - by Constantine Dovrolis *Spring 2023*

Teaching Assistant *Atlanta, GA*

CS-3510 Undergraduate Algorithms - by Gerandy Brito and Dana Randall *Fall 2022*

Teaching Assistant *Atlanta, GA*

CS-3510 Undergraduate Algorithms - by Frederic Faulkner *Spring 2022*

Teaching Assistant *Atlanta, GA*

CSE-8803 EPI Data Science for Epidemiology - by B. Aditya Prakash *Fall 2021*

Skills

Each field is listed in decreasing order of proficiency

Programming Languages: Python, R, C, Javascript, HTML, Scala, Java
Databases: SQL, Hbase, MongoDB
Machine Learning Packages & Frameworks: Pytorch, Tensorflow, Scikit-Learn, Numpy, Scipy, JAX
Cloud Computing: AWS, Azure, GCP, Red Hat
Operating Systems: GNU Linux, Windows
Map Reduce Frameworks: Apache Spark, Databricks, Hadoop
Other Tools: Git, Docker, Apache Airflow, Flask

Relevant Courses

Math Foundations of Machine Learning
Data Science for Social Networks
Computational Statistics
Randomized Algorithms
Quantitative Neuroscience
Machine Learning
Stochastic Modeling Regression Analysis
Infectious Disease Modelling
Statistical Machine Learning
Data and Visual Analytics
Artificial Intelligence
Operating Systems
Graduate Algorithms
Network Science
Programming Languages
Mathematical Statistics