Jainam Dhruva

jainam.dhruva@uky.edu | 859-420-0596 | Lexington, KY

Summary

My research applies Machine Learning and Optimization to cyber-physical systems, focusing on energy and cost savings in homes and grids. My work includes optimal HVAC control, EV/V2G integration, and developing robust ML models that can generalize across different locations and conditions. The goal is to create more efficient, adaptive, and safe energy systems.

Education

Aug 2023 - Present	PhD in Computer Science at **University of Kentucky**
May 2023	B.S in Computer Science (Summa Cum Laude) at **University of Kentucky**
May 2023	B.S in Mathematics (Summa Cum Laude) at **University of Kentucky**

Research

Research Assistant Aug 2023 Present

- Exploring machine learning ideas and optimization techniques to increase energy efficiency, reduce costs, and optimize human-feedback in Smart Grids.
- Current projects focus on optimal control of HVAC systems, developing zero-shot ML models for buildigng thermal dynamics, and integration of EVs in Virtual Power Plants.
- Keywords: Energy Management, Smart Grid, Machine Learning, Optimization, Internet of Things.

Independent Study Deep Reinforcement Learning Jan 2023 May 2023

- Provided a comprehensive analysis and comparison of the reinforcement learning algorithms, its computational costs, and implementation insights for DQN and PPO.

Undergraduate Research Fellow May 2020 Aug 2020

- Developed a workflow using LiDAR-based technology to capture and manipulate the the 3-D models of the crops to calculate the above-ground biomass of the crops in a field setting.
- Implemented a new mesh algorithm for accurately capturing the biomass in lab setting.

Research Assistant Jan 2020 May 2020

- Assisted in a project that aimed at quantifying the influence of various directors and officers at different companies by analyzing their previous experiences.
- Primary duties included collection and verification of the data for the project, and exploring python scripts for automation.

Teaching

Computer Science Teaching Assistant Aug 2023 May 2024

- Facilitated learning in Systems Programming (CS 270) by guiding students through key topics in computer architecture, operating systems, and networks.
- Managed homework, project, and lab grading for 60(Fall)+120(Spring) students.

Computer Science Grader Jan 2023 May 2023

- Led grading for ystems Programming (CS 270), providing assessments for 140 students to help them achieve foundational programming skills essential for future coursework.

Mathematics Undergraduate Assistant Jan 2023 May 2023

– Tutored students in Introductory Calculus, Multivariate Calculus, and Differential Equations, developing both their problem-solving abilities and confidence in advanced math topics.

Computer Science Tutor Jan 2022 Jan 2023

– Supported student learning across core computer science subjects, including data structures, algorithms, and computer systems, equipping them with essential analytical skills.

Internships

Software Engineer Intern May 2022 Dec 2022

– Developed and maintained mobile first, responsive, secure, and WCAG compliant sites utilizing a content management system for over 200 financial institutions.

– Participated in code reviews, providing constructive feedback and actively collaborating with team members to improve code quality and maintain best practices.

– Collaborated with cross-functional teams, clients, and third-party vendors to develop and integrate front facing features and custom work items, generating over $30,000 in profit.

Software Engineer Intern May 2021 Aug 2021

– Developed a faster, efficient, and automated tool to extract colored linear features from Point Clouds.

– Updated deprecated modules in open source libraries written in C++ and CUDA.

– Documented the implementation, the limitations, and the critical bugs encountered in the module.

Publications

Dhruva, Jainam and S. Silvestri (Oct. 2025). "Efficient HVAC Control using Machine Learning and Adaptive Differential Evolution". In: *Proc. 22nd IEEE International Conference on Mobile Ad-Hoc and Smart Systems (MASS 2025)*. [Accepted; to appear]. Chicago, USA.

Posters

– "Multi-Objective Control for V2G-Enabled Grids: Balancing Grid Stability and Battery Degradation" (IEEE PESGM)

– "Using Deep Reinforcement Learning to Solve OpenAI's 'Car Racing Environment" (UKY Undergraduate Research Showcase, 2023)

Awards and Honors

– IEEE PESGM 2025 Student Support Program Poster Competition Presentation

– UKY 3MT-3 Minute Presentation 2024 3rd Place Winner (Early researchers track)

– UKY CS 3MT 2024 Honorable Mention

– TPEC 2024 Travel Grant Attend Texas Energy and Power Conference 2024

Leadership

Treasurer	ACM Chpt. at the Uni. of Kentucky	Aug 2023 Present
International Student Ambassador	University of Kentucky	Aug 2019 May 2023
Sponsorship Chair	Cathacks, ACM Chapter	Aug 2022 May 2023
Resident Advisor	University of Kentucky	Aug 2020 May 2022

Professional Activities

Journal Proceedings Peer Review

- IEEE Transactions on Network Science and Engineering (TNSE)
- Elsevier Pervasive and Mobile Computing (PMC)
- Elsevier Computer Networks

Conference Proceedings Peer Review

- IEEE International Conference on Computer Communications (INFOCOM 2026)
- IEEE International International Conference on Distributed Computing and Networking (ICDCN 2026)
- IEEE International Conference on Pervasive Computing and Communications (PerCom 2025)
- IEEE International Conference on Distributed Computing Systems (ICDCS 2024, 2025)
- IEEE International Conference on Communication (ICC 2024, 2025)
- IEEE Intl. Conf. on Distributed Computing in Smart Systems and the Internet of Things (DCOSS-IoT 2024, 2025)
- IEEE International Conference on Smart Computing (SMARTCOMP 2025)
- IEEE International Conference on Mobile Ad-Hoc and Smart Systems (MASS 2025)
- IFIP Networking Conference (IFIP Networking 2024)
- IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMOM 2024)
- IEEE/ACM International Symposium on Quality of Service (IWQOS 2024)
- International Conference on COMmunication Systems & NETworkS (COMSNETS 2025)

Invited Talks and Presentations

- CS270 Guest Lecture: Memory Hierarchy and Caching
- CatHacks X Seminar: Introduction to Git and github
- CatHacks IX Seminar: Introduction to Git and Github
- CS 499: Senior Design Class Graduate Panel
- EGR 101 Panel: Engineering Career Panel

Skills

Languages	Python, C/C++, SQL, JavaScript, HTML/CSS, PHP.
Libraries	PyTorch, Gurobi, Hugging Face, OpenAI Gymnasium, NumPy, Matplotlib.
Other	EnergyPlus, Unix, Git.