Kartavya Suhagiya

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EDUCATION & SKILLS

THE PENNSYLVANIA STATE UNIVERSITY —— University Park, PA
*Bachelor of Science in Computer Science; **GPA: 3.99/4.00*** —— *August 2022 – May 2026*
Minor in Mathematics and IST (Information Sciences and Technology)

Languages: Python, C, Java, JavaScript, Verilog (Proficient) . PHP, MATLAB, R, TypeScript (Familiar)

Technologies: MySQL, MongoDB, MariaDB, GitHub Actions (CI/CD), Git, Docker, AWS (EC2, S3, Lambda), React.js, REST APIs, Flask, Streamlit, Firebase, OpenCV, PyTorch, LangChain, XAMPP, Moodle Plugins

Relevant Coursework: Data Structures & Algorithms, Systems Programming, Database Management, Big Data, Deep Learning, Web Development, Discrete Mathematics, Statistics, Linear Programs, Graph Theory and Automata Theory

EXPERIENCE

Fermilab (with UChicago Data Science Institute) —— Chicago, IL
Data Science Intern (Python, PyTorch, NumPy, W&B, CUDA, HPC (SLURM), PyNuML) —— *June 2025 – August 2025*
- Processed **10 TB+ of MicroBooNE** LArTPC data with U.S. DOE's Fermilab, applying a hierarchical GNN **(NuGraph3)** on UChicago DSI HPC clusters to reconstruct neutrino detector events and extract meaningful physics insights.
- Accelerated NuGraph3 model training efficiency **(7x fast)** from 14 hrs to 2 hrs/epoch by implementing **parallel I/O data processing**, removing redundant computations, and upgrading to **H100 GPUs** with mixed precision FP16 training.
- Upgraded **Object Condensation** by deriving β (clustering confidence) and co-ord. embeddings from semantic features via encoder MLP heads, then co-propagating them with message passing to yield richer context and improved clustering.

RERC on AAC —— University Park, PA
Lead Software Engineer - EDURA (Python, PHP, JS, Regex, CI/CD, AJAX, XAMPP) —— *January 2025 – May 2025*
- Transformed static AAC quizzes into AI powered chatbot **(GPT, Whisper, ElevenLabs)** simulating diverse parent personas, enabling realistic voice + text evaluations for **5,000+ pre-service teachers** across 12+ institutions.
- Engineered & refactored a scalable **Moodle plugin** into a course integrated activity (like Honorlock), adding **JSON driven short memory**, tuned prompts, and an admin UI for updates without code changes to ensure fair evaluations.
- Automated grading with structured outputs, **Regex** based score extraction, Moodle gradebook integration, & PDF feedback reports, while enhancing professionalism with foul language detection and maintainability through complete documentation.
- Reduced deployment cost to **$0.001 per session** by streamlining 10 turn LAFF conversations and optimizing API usage.

The Pennsylvania State University, ICLC, IASC and NASA —— University Park, PA
Learning Assistant, Researcher, Grader, Graphic Chair & Tutor —— *August 2023 – Present*
- Supported **2,000+ students** by tutoring in Computer Science & Math, grading assignments & leading office hours for Discrete Math, Computational Theory, Web Design, & Database Management, while also serving as **ICLC Graphics Chair** where I created event branding & digital assets that enhanced organizational visibility & drove higher student engagement.
- Led NASA affiliated asteroid search campaign team as Team Captain, detecting **Main Belt asteroids and NEOs** with **Astrometrica** software, editing reports recognized by Dr. Patrick Miller (HSU) for contributions to international research.

PROJECTS —— **View All Projects →**

EcoHarvest: AI Powered Crop Selection for Sustainable Farming | *GitHub* | *Awards*
- Developed a sustainable farming web app using **scikit-learn tree regression model** and real time API integrations (**Google Cloud, OpenAI, Twilio, Meteostat**) to analyze soil, weather, and crop data for optimized recommendations.
- Achieved **96% crop prediction accuracy** by optimizing crop selection via soil, economic and weather data analytics. Enhanced soil health, **boosted farmer profits**, and delivered live weather based decisions to support precision agriculture.
- Optimized API data pipelines for real time weather updates, ensuring **low latency** and reliable production performance.

AWARDS & ACHIEVEMENTS —— **View All Awards →**

President Walker and Sparks Award (Honored for maintaining 4.0 CGPA - Spring2023 and 2024)
Bloomberg Best Sustainability and 2nd Best Overall Hack (PennApps XXIV at UPENN - 2023)
Lockheed Martin Best Capstone and Best K-12 Award (PSU on RERC and Learning Factory - 2025)