Sunny Shah

734-272-5306 | sunnysha@umich.edu | linkedin.com/in/sunnypshah | github.com/sunnypshah1 | sunnypshah1.github.io

Education

University of Michigan **Expected: May 2027**

Bachelor of Science in Computer Science and Pure Mathematics *Ann Arbor, MI*

Relevant Coursework: Data Structures and Algorithms, Computer Science Theory, Discrete Math, Machine Learning, Computer Organization, Probability Theory, Object-Oriented Design, Operating Systems, Networking

Experience

Incoming Data & Artificial Intelligence Engineering Intern **May 2025**

Protiviti *Chicago, IL*

Software Engineer Intern - Research **November 2023 – August 2024**

Wayne State University - College of Engineering *Detroit, MI*

- Developed a drone design in CAD software, improving lift-induced drag and air resistance by conducting iterative tests and simulations, adjusting wing sizes in NVIDIA Omniverse to accurately model and evaluate real-world performance
- Utilized Power BI and Python scripts to visualize test data and create dynamic dashboards for model comparison
- Authored research proposal, outlining project goals, methodology, and expected outcomes, secured funding over $1,000
- Organized and analyzed over 20 large datasets by implementing advanced NumPy techniques, including vectorized operations, multidimensional array manipulations, and statistical analyses, significantly reducing processing time

Code Coach **July 2022 – September 2022**

theCoderSchool *Plymouth, MI*

- Mentored and coached over six students weekly, delivering personalized instruction to improve coding skills through hands-on projects and tailored lessons that fostered problem-solving, creativity, and conceptual understanding
- Developed and implemented highly dynamic, adaptable curriculums for programming languages such as Python, JavaScript, and HTML/CSS, ensuring alignment with each student's unique learning goals and skill levels
- Fostered a highly collaborative and engaging learning environment, encouraging teamwork and innovation, which contributed to a measurable 30% improvement in students' academic performance and technical proficiency

Projects

LC-2K Pipeline Simulator | *C, Computer Architecture, Systems Programming* **April 2025**

- Developed a 5-stage pipelined simulator for the LC-2K instruction set, implementing instruction fetch, decode, execute, memory, and writeback stages; integrated hazard detection, control flow handling, and data forwarding
- Debugged and optimized pipeline performance by managing control/data hazards and simulating instruction stalls

Multi-Class Image Classifier | *Python, PyTorch, Neural Networks, Logistic Regression, NumPy* **March 2025**

- Built a complete multi-class image classification pipeline in PyTorch to identify over 10 different dog breeds from real-world image datasets, achieving over 92% test accuracy after extensive tuning, experimentation, and evaluation
- Preprocessed and batched more than 10,000 labeled dog images by applying normalization, reshaping, and creating efficient, GPU-accelerated DataLoader classes to enable smooth model training and performance benchmarking
- Implemented and evaluated both a logistic regression baseline and a fully connected neural network; reduced training loss by 85% over 50 epochs through use of stochastic gradient descent and careful hyperparameter tuning
- Mitigated overfitting and improved generalization using dropout (p=0.5) and L2 regularization (λ=0.01), leading to an 11% boost in validation accuracy and significantly improved stability across multiple runs

Business Website Development – My Hydro Depot | *React, AWS, SQL, SEO* **July 2020 – July 2022**

- Designed and developed a responsive e-commerce website with a React frontend, featuring dynamic product displays, category filters, and an intuitive user interface tailored for retail customers
- Built a backend data layer using SQL to store and manage product data including inventory, pricing, and descriptions; implemented CRUD operations to enable seamless updates and ensure data consistency
- Deployed the site to AWS with distributed hosting and configured performance settings, improving uptime reliability and boosting PageSpeed Insights score by 23 points through caching and optimization techniques

Technical Skills

Languages: Python, C++, SQL, JavaScript, HTML/CSS, LaTeX
Frameworks: React, Bootstrap, jQuery, PyTorch, OpenCV, Agile, Jira
Developer Tools: Google Cloud Platform (GCP), Amazon Web Services (AWS), Git, VS Code, Jupyter Notebook, Linux
Libraries: pandas, NumPy, Matplotlib, PyTorch, SciPy, Scikit-learn
Concepts: Machine Learning, Volatility Arbitrage, Delta Hedging, Regression Analysis, Neural Networks, Optimization, Market Making, Synthetic Arbitrage, Cache Optimization