Sunny Shah

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Education

University of Michigan **Expected: May 2026**

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

Relevant Coursework: Data Structures and Algorithms, Computer Science Theory, Discrete Math, Linear Algebra, Machine Learning, Computer Organization, Multivariable Calculus, Object-Oriented Design

Experience

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 6 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

Web Developer **July 2020 – July 2022**

My Hydro Depot *Taylor, MI*

- Built a business website using a React frontend, implementing targeted SEO to elevate its ranking by eight positions
- Improved website accessibility by hosting on AWS, boosting the PageSpeed Insights score by 23 points
- Implemented an SQL database for storing products, prices, and quantities optimizing data management resulting in a 20% increase in accuracy of storage and retrieval of product information, combined with distributed storage

Projects

Personal Portfolio | *HTML, CSS, JavaScript (React), Git* **June 2023 – Present**

- Develop a modern personal portfolio using React effectively showcasing projects, education, and experience
- Implement highly engaging animations and dynamic content to enhance user experience with react-spring
- Efficiently manage and seamlessly update website code using Git, with regular uploads for version tracking and backup

Graph Optimization and Routing | *C++, MST & TSP Algorithms, Branch & Bound, Git* **November 2024**

- Developed a robust minimum spanning tree (MST) solution that dynamically calculates edge weights on demand to conserve memory, optimize performance, and ensure efficient connectivity across diverse geographic regions
- Implemented Travelling Salesperson Problem (TSP) solutions in two distinct modes—fast heuristic for near-optimal tours in large-scale scenarios and a branch-and-bound approach for exact solutions on smaller, manageable datasets
- Streamlined performance by employing rigorous memory checks (e.g., valgrind) and advanced compiler optimizations $O(n^3)$ while maintaining clear documentation and test coverage for robust, reproducible results

Option Backtesting | *Python, NumPy, Jupyter Notebook, Git, REST APIs* **May 2024 – July 2024**

- Implemented option pricing using a binomial tree model, backtested against over 20 stocks' previous data
- Designed a Python application to seamlessly interface with the Tradier API, enhancing real-time financial decision-making by enabling access to comprehensive options chain data, including Greeks and implied volatility
- Documented all development processes and results in a Jupyter Notebook, thoroughly facilitating project transparency and reproducibility by providing detailed step-by-step code explanations and output visualizations

Technical Skills

Languages: Python, C++, SQL, JavaScript, HTML/CSS, LaTeX
Frameworks: React, Bootstrap, jQuery, OpenCV, Agile, Jira, Docker, Node
Developer Tools: Google Cloud Platform (GCP), VS Code, Amazon Web Services (AWS), Linux, Git, Jupyter Notebook
Libraries: pandas, NumPy, Matplotlib