Aakash Kalmady

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Education

University of Maryland, College Park   College Park, MD
Bachelor of Science in Computer Science   *Expected Graduation: May 2027*
- GPA: 3.74/4.00, 3x Dean's List
- Relevant Coursework: Data Structures and Algorithms, Object-Oriented Programming, Computer Systems, Data Science, Discrete Mathematics, Statistics and Probability, Linear Algebra, Organization of Programming Languages

Experience

Shadowing Software Engineer   Sep 2024 - Dec 2024
Booz Allen Hamilton (via UMD App Development Club)   *College Park, MD*
- Contributed to a student-led team contracted by **Booz Allen Hamilton** that automated the auditing process for Medicaid and CHIP claims, **reducing 12 hours** of weekly work and **saving $50,000** annually
- Developed tooltips using **Next.js**, **TypeScript**, and **TailwindCSS**, enhancing the product's user experience and accessibility
- Collaborated in weekly meetings with Booz Allen representatives to discuss our progress and deliverables, gaining exposure to the professional software development lifecycle
- Presented the software's core functionalities to Booz Allen policy specialists, demonstrating technical communication and project understanding
- Gained insight into scalable software architecture by studying **RESTful APIs** for service communication, **Docker** for containerized deployment, and a Python ML backend using **PyTorch** and **Tesseract OCR** for keyword generation

Projects

Eye Disease Detector | *Python, Jupyter Notebook, Flask, AWS EC2, TensorFlow, OpenCV, Docker*   Jul 2025 - Present
- Developing a **machine learning model** to classify three eye diseases by analyzing a dataset of over **4,000 retinal images**
- Fine-tuning an ML model using **OpenCV** and NumPy for image processing and **TensorFlow** for a convolutional neural network (CNN) implementation, achieving a mean **accuracy of 87.8%** through 10-fold cross-validation
- Developing a **REST API** using **Flask** to integrate the ML model with an app to extract user image data for classification
- Deploying the application using **Docker** and designing it for scalable deployment on cloud infrastructure with **AWS EC2**

ClarityVue (clarityvue.com) | *Next.js, TypeScript, PostgreSQL, AWS S3, Clerk, OAuth 2.0, Zod, Jest*   Jun 2025 - Jul 2025
- Engineered a **full-stack** photo portfolio service with authentication, album management, image uploads, and profile sharing
- Designed a scalable cloud infrastructure supporting over **1 TB of media** and **500+ concurrent users** using **AWS S3** for media storage and Neon serverless **PostgreSQL** for high availability
- Reduced load times to **under 200ms** in production by leveraging **Next.js SSR** and optimizing complex database queries
- Protected against SQL injection attacks and enforced user-specific data access using Clerk for **OAuth 2.0** and **Zod** schema validation, leveraging **Jest** to test **20+ server actions** and **REST API endpoints** for reliability

Climate Data Science Project | *Python, Linux, Derecho HPC*   Sep 2024 - Dec 2024
- Researched the impact of sea surface temperature on hurricane intensity by simulating Hurricane Ida under **3 conditions**
- Built Python and shell scripts to automate the processing of over **100 GB of climate data** from **3,000+ files** on a remote, Linux-based Derecho HPC supercomputer
- Examined hurricane intensity patterns by documenting 15 hurricane data plots using **wrf-python** and shell scripts

VEX Robotics | *C++, V5 PROS API*   Sep 2021 - May 2023
- Earned the **design award** at the world championship, competing with 800 teams, and the title of **national champions**
- Developed C++ programs and feedback controllers using 10 different sensors for the autonomous navigation of a robot
- Fine-tuned controllers by finding optimal settings in Excel for **50% more precision** within a **1% error** margin (± 0.2 inches)
- Documented results in a **500+ page** notebook to illustrate the design process and project management of our team

Technical Skills

Languages: Python, Java, C, C++, JavaScript, TypeScript, Rust, OCaml, HTML, CSS, SQL (PostgreSQL), x86-64 Assembly, MATLAB
Frameworks: Next.js, React.js, Node.js, Express.js, Jest, Flask, TailwindCSS
Developer Tools: AWS (S3, EC2), Google Cloud Platform, Clerk, Neon, k6, Vim, Unix, Git, Valgrind, GDB, AutoCAD
Libraries: TensorFlow, OpenCV, Pandas, NumPy, Scikit-learn, Matplotlib, Zod, Drizzle ORM