NAUD TAFESSE

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SUMMARY

AI-focused Computer Science graduate with hands-on experience building edge machine learning systems and deploying full-stack applications to AWS. Developed sensor-based ML classification pipelines on Raspberry Pi hardware and deployed scalable, secure cloud-native applications using ECS, EC2, and MongoDB. Passionate about bridging embedded AI systems with production-ready cloud infrastructure.

EDUCATION

Virginia Polytechnic Institute and State University **Blacksburg, Virginia**
Bachelor of Science in Computer Science *August 2021 — May 2025*
Relevant Coursework: Software Design & Data Structures, Computer Organization, Data Structures & Algorithms, Computer Systems, GUI Programming/Graphics, Cloud Software Development, Mobile Software Development, Data & Algorithm Analysis, Artifical Intelligence with Python

EXPERIENCE

Regal Abyssinia **Falls Church, Virginia**
Full-Stack Developer *May 2025 — August 2025*
- Designed and implemented a full-stack restaurant platform with a React front-end and a Spring Boot backend, providing a seamless user experience for menu browsing, secure online ordering, and submit reviews.
- Implemented RESTful API integration between React and Spring Boot for efficient data exchange and secure transaction processing.
- Built dynamic content management using MongoDB to handle menu updates, order history, and customer comments.
- Dockerized the application for consistent environment replication, and deployed to AWS ECS Fargate for containerized orchestration and scalability.
- Configured frontend and backend load balancers to ensure fault tolerance and performance under peak demand.
- Secured the domain with HTTPS using SSL/TLS certificates for end-to-end encryption.
- Integrated JWT-based authentication, strengthining transaction security and prevent unauthorized access to user accounts.
- Used Git/GitHub for version control to manage collaborative development and track project changes.

Tech Stack | *JavaScript, MongoDB, React, Node.js, Spring Boot, Docker, AWS ECS*

CodeKids VT **Blacksburg, Virginia**
Undergraduate Researcher *January 2025 — May 2025*
- Developed interactive, web-based educational content using HTML, CSS, and JavaScript to teach AI, coding, and cybersecurity to elementary and middle school students.
- Created hands-on coding activities and digital books aligned with school curricula, increasing student engagement in STEM subjects.
- Partnered with educators to design age-appropriate learning modules, improving comprehension and retention of technical concepts.

Tech Stack | *HTML, CSS, JavaScript, React, Node.js*

MachWorks **Blacksburg, Virginia**
Avionics Developer *May 2024 — December 2024*
- Designed and implemented a real-time sensor integration system in C to monitor altitude of a high-speed mini-plane with sub-meter accuracy.
- Engineered precise, low-latency height readings contributing to improved flight stability and navigation reliability during test operations.
- Collaborated with cross-disciplinary engineering teams to optimize hardware/software integration enhancing system responsiveness and flight control performance.

Tech Stack | *C, Embedded Systems, Sensor Integration*

RELEVANT PROJECTS

AI Cologne Identification System | *Python, Flask, scikit-learn, NumPy, Pandas, Raspberry Pi, BME688*

- Designed and implemented an edge-based machine learning system capable of identifying specific colognes and fragrance profiles using volatile organic compound (VOC) signatures captured from a Bosch BME688 gas sensor.
- Engineered a multi-temperature heater scanning pipeline (200°C–360°C) to collect five-step gas resistance fingerprints per sample, enabling differentiation between fragrance compositions.
- Developed rolling-window time-series feature extraction incorporating absolute gas statistics, normalized signal behavior, slope dynamics, and heater-step medians to model distinct scent signatures.
- Trained and evaluated a RandomForest classifier using scikit-learn to distinguish between air and multiple cologne profiles, implementing plateau-aware segmentation and sticky prediction logic for stable real-time identification.
- Built a live web dashboard using Flask and real-time event streaming to visualize gas behavior and perform on-device classification directly on a Raspberry Pi 5 without cloud dependency.
- Implemented out-of-distribution safeguards to detect abnormal sensor readings and prevent false classification during hardware instability.

AI Crisis Events Web Crawler | *Flask, React, scikit-learn, MongoDB, Docker*

- Developed an interactive full-stack web application enabling users to train models, configure crawl parameters, and analyze crisis-related content through dynamic graphs and URL lists.
- Integrated advanced filtering methods including keyword-based and one-class classification into a seamless frontend connected to a FastAPI backend.
- Visualized complex crawl data using vis-network.js, implementing dynamic URL tree graphs with interactive node exploration for intuitive data analysis.
- Containerized the application with Docker for consistent deployment across environments and faster setup times.
- Employed Git/GitHub for version control, supporting iterative development and collaborative feature integration.

Vacation Plan Assistant | *Jakarta EE, PrimeFaces, MySQL, AWS EC2, Gradle, Wildfly (JBoss)*

- Developed a full-stack, cloud-based travel planning application with a PrimeFaces-based UI, featuring flight comparison, vacation reviews, and weather forecasting capabilities.
- Implemented SQL data management with Jakarta Persistence (JPA/Hibernate) to store and retrieve both private user flight data and public vacation listings in a MySQL database, enabling persistent sessions and fast lookups.
- Enabled account creation, saved flight tracking, public reviews, and printable ticket generation for a complete end-to-end user experience.
- Built and deployed on JBoss Application Server, using Gradle for build automation and dependency management.
- Integrated the Amadeus, Open-Meteo, and Google Maps APIs to provide real-time travel, weather, and location data.
- Utilized Git/GitHub for version control to maintain code integrity and facilitate collaborative development.

Custom Linux OS Shell | *C and Unix*

- Built a C-based Linux shell supporting key commands like cd, fg, bg, and history.
- Includes implementation for input/output and piping, and terminal ownership for jobs
- Runs up to one foreground job at a time and can run one or more background jobs at the same time

Personal Web Server | *C, JWT, and Svelte*

- Created a personal HTTP web server using Svelte that can support IPv4 and IPv6 addresses, HTML5 fallback
- Implemented MP4 streaming capabilities, ensuring efficient video playback and support for diverse media needs.
- Enabled secure password authentication for a single user by integrating JWT web tokens enhancing server security

TECHNICAL SKILLS

Languages: Java, Python, C, HTML/CSS, JavaScript, Kotlin
Databases: MongoDB, MySQL
Frameworks & Libraries: React, Primefaces, Express.js, Node.js, Spring Boot, JPA/Hibernate, Material UI, JUnit
Tools & Platforms: AWS (ECS Fargate, EC2, RDS, Route 53, CloudFront), Docker, JBoss Application Server, Gradle, Maven, Jakarta EE, Git/GitHub
Other Skills: REST API design & integration, load balancing & scaling in cloud environments, SSL/TLS security configuration, data visualization