ALEXANDER PEAL

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EDUCATION

Virginia Tech   Blacksburg, VA
Bachelor of Science, Computer Science   *Expected Graduation: May 2026*

WORK EXPERIENCE

Undergraduate Teaching Assistant   Blacksburg, VA
Virginia Tech   *January 2024 – Present*
- Led weekly sessions for 250+ students, preparing over 12 cheat sheets for **Python**, **C** and **RISC-V** programming assignments.
- Implemented interactive coding sessions during biweekly office hours, enhancing student performance on projects.

Software Engineer Intern   McLean, VA
Appian   *June 2024 - August 2024*
- Updated **AWS Global Accelerator** association **Python** scripts to find valid **AWS ALBs**, lowering incident resolution time by 95%.
- Added 20+ **Prometheus** metrics to a **Nginx**-based web redirect service supporting the migration of 500+ customer domains.
- Implemented **Kubernetes Event-Driven Autoscaling (KEDA)**, allowing service to handle more than 100,000 requests per hour.
- Developed and deployed service using **Helm**, **ArgoCD**, **Docker**, **AWS EC2**, and **GitLab CI**, maintaining 100% service availability.
- Enhanced system observability by designing a **Grafana** dashboard and implementing 5+ custom **PromQL** alerts.

Software Engineer Intern   Manassas, VA
General Dynamics Mission Systems   *May 2023 – August 2023*
- Engineered a **Python** and **C**-based user interface for an RF block downconverter, reducing automated testing duration by 83%.
- Built a **Node.js** diagnostic app in **Oracle Virtualbox** for an embedded system, enabling real-time monitoring for over 20 sensors.
- Led a critical presentation to Department of Defense contractors, contributing to a successful bid for a $500M+ contract.

EXTRACURRICULARS

Student Ambassador   Santa Clara, CA
Intel Corporation   *March 2024 – Present*
- Led over 10 LLM deployment workshops, contributing to over 200 students adopting the Intel Developer Cloud platform.
- Developed a rap instrumental generator using Intel's OpenVINO library to accelerate MusicGen model inference by over 200%.

Software Development Lead   Blacksburg, VA
Hackers at Virginia Tech (VTHacks)   *January 2023 – Present*
- Led software development for VTHacks, the third largest hackathon on the East Coast, managing over 4000 lines of code.
- Identified back-end optimizations in existing code, accomodating a 183% increase to more than 2200 registrations.
- Streamlined development process by implementing detailed **Trello**-based sprint maps, leading to the successful deployment of a check-in system, web app, and event website 30 days ahead of schedule.

Research Intern   Blacksburg, VA
Hume Center for National Security and Technology   *January 2024 – May 2024*
- Developed automated data processing pipelines using **Go**, reducing system latency for large-scale data analysis tasks.
- Built CI/CD pipelines with **Jenkins** to automate the provisioning of 5 different HPC environments.
- Integrated **Apache Kafka** for real-time data streaming, improving data throughput by 40% across distributed systems.

PROJECTS

Daily Side Quest Social Media App | *Firebase, React Native, Google Cloud*   *April 2024*
- Created a fully functional social media application allowing users to complete over 25 different daily quests with friends.
- Utilized **Firebase Cloud Functions, Authentication, and Cloud Firestore** to neatly manage over 15 API endpoints.
- Built a responsive mobile-first front-end for the application in **React Native**, supporting user login/signup, photo uploads, the ability to see and like other user's posts, and activity streaks, among other features.

AI Agent for Elderly Patient Care | *OpenAI, Python, TensorFlow, Express*   *March 2024*
- Developed a virtual nurse that aids patients during Stanford University's hackathon accepting less than 10% of applicants.
- Implemented **TensorFlow** CV models to detect patients in crisis and used OpenAI's Whisper to collect data for first responders.
- Implemented asynchronous event handling and caching for LLM responses in **Express**, reducing response latency by 40%.

Agile Project Management Tool | *Node.js, Express, React/Next.js, MongoDB, Tailwind CSS, Mocha/Chai*   *Jan 2024*
- Developed an agile project tracker that can create, read, and update tasks using **MongoDB**, **Node.js**, **Express**.
- Wrote 20+ unit tests using **Mocha**, **Chai**, and **StrykerJS**, and utilized **JSDoc** for documentation, ensuring project stability.

TECHNICAL SKILLS

Programming Languages: Python, Java, JavaScript, TypeScript, C, C++, Go, Rust, Bash
Libraries/Frameworks: Kubernetes, Helm, Node.js, Express.js, React, Tailwind CSS, Keras, TensorFlow, FastAPI
Developer Tools: Git, Gitlab, GitOps, AWS, Docker, Linux, t MongoDB, PostgreSQL, Prometheus, Grafana, Apache Spark