**EDUCATION**: Senior - Science, Math, Computer Science Magnet Program at Poolesville High School **RELEVANT COURSES**: Analysis of Algorithms, AP Computer Science, AP Statistics, Foundations of Technology

**EXPERIENCE**

* **Large Language Model Fine-Tuning** - Using a dataset of every text I’ve ever sent or received, developing a targeted method of fine-tuning Meta’s open-source large language model, Llama 3.1, using Python to respond to texts in a manner indistinguishable from myself. Leveraging Google’s Cloud Compute services with Tensorflow and Nvidia CUDA parallelization for each training iteration and have been experimenting with different training parameters to minimize loss in response accuracy.
* **Home Server** - Using a collection of Docker containers, created and configured a home media server on a Raspberry Pi 3B+ with the capability to stream media throughout my home. The challenges that came from running this on low powered hardware taught me about the benefits of containerization, as well as how different hardware acceleration methods can be adapted for low-spec devices.
* **Autonomous** **Blimp Project -** Designed (using CAD) and 3D printed gondola for an autonomous blimp that was both lightweight and capable of holding sensors and motors. Designed, engineered, and developed software to facilitate autonomous movement of the blimp utilizing a Raspberry Pi computer and motors. Utilized the socket software structure to facilitate wireless communication between the Raspberry Pi Computer and another computer. Developed OpenCV image processing pipelines for locating waypoints to facilitate autonomous movement.
* **Personal LLM Assistant -** Using self-hosted Docker instances of n8n and Ollama, I constructed an automation workflow allowing a tool-assisted LLM agent to access and manipulate my Spotify and Notion accounts when given written instructions.
* **Independent Application Development** - As core programmer on a small team of student developers, iteratively designing a mobile app to assist with student mental health throughout our school district. Contact has been established with administrators and initial launch at 4 high schools planned for the coming months.
* **Gene Data Representation -** Utilized the R programming language to create scalable vector graphic representations of data from a genome-wide association study. Constructed a lesson plan in close collaboration with my teacher to better integrate R into the biology curriculum.
* **Robotic Rover Project -** As part of a team, designed and built a robotic rover capable of traversing a variable terrain on a simulated exoplanet, and collecting and analyzing data about the environment to detect dunes on the planet surface. As Lead Programmer, developed code to facilitate navigation, movement of a scooper to collect samples, and a camera. Applied engineering principles from multiple disciplines, creative problem-solving, iterative design, prototyping, and various fabrication methods and tools (e.g., CAD, 3D printing).
* **Software Development for a Staff Member** - Solicited and documented requirements, designed, programmed in HTML, CSS, and Tailwind, tested, and delivered a room reservation application for a school administrator. As Lead Programmer, developed backend and frontend, and utilized a MongoDB remote database. Applied object-oriented and iterative software development processes and methodology (e.g., scrum-type meetings, Software Project Management Plan) to develop and deliver the product on schedule per specified timelines.

**SKILLS**

* **Proficient in**: Python, Java, React Native, Linux file systems, Presentation development and delivery
* **Learning:** Docker Containers, Kubernetes, Network Scanning, LLM Fine-Tuning, MongoDB