Arthea Valderrama

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EDUCATION

University of Massachusetts Lowell **Sep., 2025**
Honors College B.S in Computer Science, Minor in Mathematics, *Lowell, MA*

- **GPA: 3.72/4.0**; Honors Fellow, National Scholar, Grace Hopper Scholar, Chancellor's List, Dean's list, Summa Cum Laude
- **Certifications**: Data Analysis with R, Bloomberg Market Concepts

WORK EXPERIENCE

Schneider Electric **Sep. 2024 – Present**
Cybersecurity Firmware Developer Co-op | Sep., 2025 - Present *Andover, MA*

- Resolve 15+ high-priority security defects, completing 60+ story points across multiple Agile sprints
- Developing a C/C++ security library leveraging TPM2.0 to enhance device verification within a Linux environment

AI Cybersecurity Research Assistant | Sep., 2024 – May 2025

- Prior to promotion, developed adversarial patches on a classification model for quality control in real-time manufacturing system, resulting in successful attacks and model accuracy dropping below 10%
- Created anomaly detection model for facial recognition, achieving 97% accuracy in detecting adversarial attacks
- Launched a full-stack React.js application with integrated chatbot API on Vercel, improving response time by 16%

Harvard Medical School **Jun. 2025 – Present**
Department of Biomedical Informatics Intern *Boston, MA*

- Developed a Python-based data generation pipeline that created 1.02 million+ natural language queries in accordance with a JSON specification to support finetuning a LLM model with genomics interfaces, published on HuggingFace
- Engineered review software application in Vue and Typescript, implementing SQL retrieval of large dataset into genomics visualization API, ensuring alignment of dataset with research goals

Department of Physics, University of Massachusetts Lowell **Sep. 2024 – May 2025**
Machine Learning Research Assistant *Lowell, MA*

- Created a multidisciplinary approach leveraging generative language models for protein design, reducing RMSD by 46%
- Performed time-series analysis and visualizations of 200+ residue trajectories to enhance structural predictions

Harvard University – Center for Astrophysics **Jun. 2023 – Aug. 2024**
Machine Learning Research Assistant, Peer Leader | Jun., 2024 – Aug. 2024 *Cambridge, MA*

- Rehired due to strong performance; built, tested, and trained an autoencoder model with 5,000 datasets of atomic energy data in PyTorch to synthesize spectra, resulting in a loss function converging below 0.05
- Reduced spectral computation time from 2 weeks to 2 hours by leveraging ML methods to enhance atomic data models
- Served as supportive mentor for a cohort of underrepresented students in science, enhancing collaboration and team dynamics

Software Engineer Intern | Jun. 2023 – Aug. 2023

- Developed a C++-Python interface for spectroscopy software XSPEC, enabling seamless integration of Python scripts through a C++ language interpreter, leading to improved model accessibility for astronomers and AAS conference poster presentation

Engaging Computing Lab, University of Massachusetts Lowell **May 2022 – Jun. 2023**
Web Developer, Peer Leader *Lowell, MA*

- Maintained and updated data visualization website with REST architecture using HTML, CSS, JavaScript, and Ruby on Rails to resolve bugs and server issues to ensure the site remains user-friendly
- Managed colleagues' development environment and provided tailored resources to improve project efficiency on iSENSE

SKILLS

- **Programming Languages:** C++, Python, C, R, SQL, HTML, CSS, JavaScript, Ruby on Rails
- **Frameworks:** Object Oriented Design, React.js, Node.js, Vue, Flask, Pytorch, Scikit-learn, AWS CDK
- **Developer Tools:** Microsoft Office, Git, Docker, AWS, VS Code, Visual Studio, Valgrind, Tableau, Jupyter Notebook
- **Libraries:** PyTorch, Transformers, Pandas, NumPy, Matplotlib

PROJECTS

Health Behavior Analysis Using BRFSS Data **Dec. 2025**

- Modeled U.S health disparities by analyzing 400k+ CDC survey responses in R using tidyverse, survey, and ggplot2

Brain Tumor MRI Prediction Model **May 2025**

- Implemented a Flask web app for MRI brain tumor classification and adversarial perturbation detection with 98% accuracy, while delivering natural language diagnostic summaries using the Gemini API chatbot