Abdallah Elsayed

Portfolio | 571-645-0304 | abdallahae15@gmail.com

Skill Highlights

- **Programming & Tools**: C, C++, C#, Python, Java, JavaScript, TypeScript, React, Node.js, Next.js, HTML, CSS, Tailwind, JWT, Jira, Figma, MySQL, MongoDB, PostgreSQL, Redis, Vulkan, GLFW, Imgui, FastAPI, Flask, Spring Boot, Git, GitHub Actions, Gitbook, Docker, AWS ECS & EC2, Sagemaker, Bedrock, Jupyter Notebook, rds, PyTorch, Terraform (IaC), Visual Studio, vi/vim, Make, CMake, Maven, Windows Forms, Unity, Unreal, Godot, Blender, Photoshop.
- **Development**: Game development, Graphics/Physics engine, mobile application development, fullstack web development, Windows desktop programming.

Work Experience

SOFTWARE ENGINEER INTERN | BOOZ ALLEN HAMILTON | JUNE 2025 – AUGUST 2025

- Designed and implemented an AI-powered fraud detection system for the USDA SNAP program using Python, AWS SageMaker, and Jupyter Notebook, integrating XGBoost, Isolation Forest, and rule-based models, achieving AUC-ROC 0.94 and F1-score 0.89 with projected $5.6B in annual savings.
- Developed scalable data ingestion pipelines on AWS S3 and RDS to unify fragmented SNAP transaction, retailer, and demographic datasets, including synthetic data generation to simulate realistic spending patterns.
- Built and deployed real-time inference services with ≤1ms latency using geo-distributed architecture on AWS, with automatic failover for high availability.
- Created an interactive fraud analytics dashboard to help analysts and administrators visualize trends, investigate flagged cases, and optimize resource allocation.
- Implemented SHAP-based model explainability to quantify feature importance, conduct fairness audits, and mitigate bias, leveraging AWS Bedrock for LLM-assisted data interpretation.

HWO OPTICS & ML INTERN | NASA | JUNE 2024 – AUGUST 2024

- Conducted research and development on cutting-edge coronagraph technology, contributing to NASA’s mission to discover habitable exoplanets.
- Optimized the performance of deformable mirrors (DMs) using predictive CNN machine learning algorithms, enhancing the precision and efficiency of wavefront correction systems.
- Collaborated with leading experts on high-contrast imaging, creating Python scripts to develop training data for machine learning models that improved data simulation accuracy.
- Played a key role in the open science development for the Habitable Worlds Observatory (HWO), focusing on advancing the software and algorithms behind the observatory's coronagraph instruments.

- Engaged in hands-on experience with advanced optical systems, including a tour of STScI and Goddard, where I worked closely with a 250-actuator parabolic DM.
- Delivered technical presentations and contributed to team meetings, showcasing improvements in coronagraph system performance through AI-enhanced techniques.

SOFTWARE ENGINEER | GENLOGS | MARCH 2024 – PRESENT

- Developed and implemented a centralized Customer Identity and Access Management (CIAM) system, integrating seamlessly with multiple teams' APIs and portals to streamline SSO authentication and RBAC authorization processes across the company.
- Spearheaded the solo development and early launch of the Asset Locator API and portal, originally planned as a prototype for 2025, delivering it 6 months ahead of schedule through exceptional performance and dedication. This initiative directly contributed to securing contracts worth over $300K and enabled customers to generate millions of dollars in returns.
- Optimized core deep search database queries, reducing execution time from one minute to below 2 seconds, significantly enhancing system performance and user experience.
- Brought down the loading time for displaying thousands of images to users from an average of 30 seconds to milliseconds, dramatically improving user interaction with the product.
- Set up multiple monitoring solutions for APIs and products using Sentry, Google Analytics, and Hotjar, ensuring proactive issue detection and performance tracking.
- Accelerated the development of an internal monitoring tool to effectively observe and manage devices deployed nationwide, providing real-time insights and improving operational responsiveness.
- Developed the initial frameworks for CI/CD pipelines using GitHub Actions, automating build, test, and deployment processes to ensure faster and more reliable software delivery across various projects.

DATA STRUCTURES TA | GEORGE MASON UNIVERSITY | JANUARY 2024 – MAY 2024

- As a teaching assistant in a data structures class, I contributed by grading assignments, addressing student queries, and offering guidance during class projects. My role involved fostering a deeper understanding of data structures concepts and ensuring students' success

Related Coursework

COMPUTER GRAPHICS | GRADE: A | JANUARY 2025 – MAY 2025

- Topics: 2D Compositing, 2D and 3D Transformations, Ray Tracing, Illumination, Image Processing, Mesh Processing, The Graphics Pipeline, GPU Shader Programming, Texture Mapping, Animation

OPERATING SYSTEMS | GRADE: A | JANUARY 2025 – MAY 2025

- Topics: Operating System Fundamentals, Processes and Threads, Concurrency and Synchronization, CPU Scheduling, Memory Management and Virtual Memory, File and Storage Systems, Security

COMPUTER SYSTEMS AND PROGRAMMING | GRADE: A | AUGUST 2024 – DECEMBER 2024

- Topics: Data and Number Representation, Linking and Loading, Machine Level Representation of Data and Programs, Exceptional Control Flow, Processes, Signals and Unix I/O, CPU Architecture and Design, Virtual Memory and Caching, Dynamic Memory Allocation

LOW-LEVEL PROGRAMMING | GRADE: A+ | JANUARY 2024 – MAY 2024

- Topics: C Types, Operators, and Expressions, Basic I/O, Control Flow, Functions, Pointers, Dynamic Memory Allocation, Bitwise Operations, The Unix System Interface, Debugging with GDB and Valgrind.

DATA STRUCTURES | GRADE A+ | AUGUST 2023 – DECEMBER 2023

- Topics: Lists, Stacks, Queues, Hash Tables, Trees, Graph Algorithms.

OBJECT ORIENTED PROGRAMMING | GRADE A+ | JANUARY 2023 – MAY 2023

- Topics: Classes, Interfaces, Inheritance, Polymorphism, Error Handling, Debugging, Unit Testing.

ELECTIVES | AUGUST 2018 – MAY 2022

- **IB Computer Science**: Hardware, Networks, OOP, Java, C#, HTML.
- **Cybersecurity**: SQL basics, Cryptography, Firewalls, OS Security, Network Security.
- **Multimedia**: Microsoft Suite, Graphic Design using Photoshop and Adobe Illustrator.
- **Programming**: JavaScript, Python, SQL, Game Development.

MASON GAME & TECHNOLOGY ACADEMY | JUNE 2017 – AUGUST 2017

- **C# Programming**: Game Development in Unity.
- **Cybersecurity**: Securing Windows and Linux-based operating systems.
- **Cloud Computing**: IoT, Servers, AWS, Google Cloud, Azure basics.

Education

B.S. | 2022-2026 | GEORGE MASON UNIVERSITY, FAIRFAX, VA

- Honors College, Computer Science Major
- GPA: 3.98
- Dean’s List Recipient 2022, 2023, 2024, 2025

ADVANCED DIPLOMA | 2018-2022 | EDISON HIGH SCHOOL, ALEXANDRIA, VA

- GPA: 4.5
- Involvement: Future Business Leaders of America, Model United Nations, Muslim Student Association.