

Afnan Alabdulwahab

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EDUCATION

Jun 2024 – May 2025	University of Virginia Charlottesville, VA Master of Science in Data Science Relevant Coursework: Bayesian Machine Learning, Deep Learning, Decoding LLMs, GPU Architectures
Aug 2012 – May 2017	Old Dominion University Norfolk, VA Bachelor of Science in Electrical Engineering, Minor in Applied Mathematics Bachelor of Science in Computer Engineering, Minor in Computer Science

EXPERIENCE

Emerson Automation Solutions | Charlottesville, VA

Senior Software Engineer/Product Owner | Jan 2022 – Jun 2022

- Acted as individual contributor (IC) and Product Owner of Emerson's PLC programmer (PME), focusing on creating and managing product backlogs, crafting detailed user stories, guiding developers, and delivering production software
- Collaborated with cross-functional teams to define and translate high-level requirements into detailed user stories and actionable plans for complex projects
- Optimized hardware configuration performance through implementing solutions (C++) for power management issues, improving runtime efficiency and reliability
- Enhanced team collaboration and productivity through leadership in Agile processes, backlog refinement, and cross-functional communication

Senior Software Engineer | Jun 2021 – Dec 2021

- Led development of support for new family of Emerson's PACSystems Controllers (PLCs) in a large-scale 14-million-line legacy COM-based desktop application (C, C++, C#) used by customers to configure and program Industrial Control Systems
- Provided mentorship, guidance, and pair programming to new team members, contributing to their successful onboarding and growth within the team
- Communicated progress and technical concepts to stakeholders and team leads, improving transparency and alignment

Firmware Engineer | Sep 2019 – Jun 2021

- Developed embedded (C/C++) firmware for the PACSystems controllers using WindRiver's VxWorks RTOS
- Worked collaboratively with engineers across teams and time zones to debug complex firmware issues

PROJECTS

UVA Capstone: Comparative Study of Large Language Model Evaluation Frameworks | Oct 2024 – May 2025

Python, LLMs, Claude, Bias Dataset, RAGAS, promptfoo, DeepEval, TruLens

- Collaborated with industry sponsor to analyze and compare evaluation frameworks for LLMs (LLM-as-a-Judge) across key metrics: accuracy of response and retrieval, bias, toxicity, hallucination detection, and tone identification
- Led bias detection evaluation assessing performance of built-in framework metrics against custom evaluation techniques
- Implemented Counterfactual Data Testing using WinoBias dataset, measuring LLM response consistency when sensitive attributes (e.g., gender roles) were altered
- Developed and implemented custom bias detection methods using promptfoo, DeepEval and RAGAS frameworks, conducting comparative analysis on 1,500+ sentence pairs from the CrowS-Pairs dataset to assess bias detection accuracy and limitations
- Combined counterfactual data testing and contextual sensitivity analysis to assess and improve gender bias evaluation in LLMs

Accelerating Transformer Attention with Custom CUDA Kernels | Feb 2025 – May 2025

Python, C++, PyTorch, CUDA, NVIDIA Nsight Systems, Profiling Tools

- Conducting performance analysis of PyTorch's MultiheadAttention module through systematic profiling to identify bottlenecks in matrix operations and memory access patterns
- Analyzing computational bottlenecks in attention mechanisms through kernel-level profiling, identifying opportunities for optimization in matrix operations and memory transfers
- Aiming to develop custom CUDA extension to maximize GPU resource utilization and reduce inference/training latency

SKILLS

Programming Languages: Python, R, C++, C#, C, SQL, CUDA

Libraries and Frameworks: Tidyverse, Pandas, NumPy, Matplotlib, PyTorch, TensorFlow

Machine Learning: Supervised Learning, Unsupervised Learning, Regression, Penalized Regression, Classification, Clustering, Decision Trees, Random Forest, Boosting, Support Vector Machines

Statistical Analysis: Resampling Methods, Bayesian Statistics, Statistical Modeling, Inferential Statistics

Development Tools: VxWorks RTOS, Git, Automated Testing (NUnit, Electric Commander), VS Code, Jupyter Lab, RStudio

Methodologies: Agile, Scrum, SAFe