

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 (Acquired from GE) | 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

GE Automation & Controls | Charlottesville, VA

Software Engineer | Jan 2018 – Sep 2019

PROJECTS

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

Python, LLMs, Claude, Bias Datasets, 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