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, NLP, Bias Datasets, RAGAS, promptfoo, DeepEval, TruLens, Empath, Stanford CoreNLP, LLM-as-a-Judge

- Led bias detection research stream in Deloitte-sponsored capstone project, designing comprehensive evaluation methodology comparing LLM-as-a-Judge frameworks against traditional NLP methods across 8 key metrics including bias, toxicity, and hallucination detection
- Implemented multi-dataset bias evaluation pipeline using WinoBias and CrowS-Pairs datasets to assess gender bias and social bias detection across 9 demographic categories (race, gender, religion, etc.)
- Implemented counterfactual testing framework measuring LLM response consistency when sensitive attributes were altered
- Co-authored research paper and developed interactive leaderboard application providing evidence-based framework selection guidance for responsible AI deployment

Benchmarking GPU Matrix Operations Optimizations | Feb 2025 – May 2025

C++, CUDA, Python, CUTLASS, cuBLAS, CuTe, Tensor Cores, NVIDIA Nsight Systems, GPU Profiling Tools

- Implemented and benchmarked CUDA kernels for matrix transpose optimization across NVIDIA RTX 2080 Ti (Turing) and A100 (Ampere) GPUs, exploring opportunities to reduce latency and improve GPU resource utilization for transformer-based models
- Developed multiple custom implementations—including naive baseline, shared memory tiling with padding, swizzled indexing, vectorized memory access using float4 data types, and warp shuffle primitives—and compared performance to optimized libraries (cuBLAS, CUTLASS, CuTe)
- Analyzed performance across matrix sizes (32×32 to 8192×8192), evaluating throughput, memory bandwidth utilization, and access patterns to identify optimal architecture- and dimension-specific optimization strategies

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 and Methodologies: VxWorks RTOS, Git, VS Code, Jupyter Lab, RStudio, CICD, Agile, Scrum, SAFe