Bashir Mohammed, PhD

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Summary

I am a Senior Staff AI Architect at Intel's Network and Edge Group, where I lead cutting-edge innovations in AI at the Edge. My work focuses on developing and deploying Large Language Models (LLMs), Large Vision Models (LVMs), and multi-agent workflows to drive transformative solutions across various industries. I collaborate closely with customers to understand their needs and pain points, providing customized solutions, and facilitating successful technology adoption. I hold a Ph.D. in Computer Science and bring extensive research experience from my previous role at Lawrence Berkeley National Lab, where I specialized in AI applications for intelligent networks, automatic control systems, quantum communication networks, and data provenance in high-performance computing and distributed systems.

Experience

- **Intel Corporation** *Feb 2023 - Present*
  Senior Staff AI Architect, Office of the Chief Technology officer (OCTO) Santa Clara, CA
  - Currently working with Natural Language and Vision models, focusing on Large Language Models (LLMs), Large Vision Models (LVMs), Small Language Model (SLMs), and Vector Databases, while building Retrieval Augmented Generation (RAG) pipelines.
  - Leading the Anti-halucination effort, creating advanced prompt engines to reduce hallucination in LLM outputs and developing RAG Pipelines and agentic workflows tailored to customer needs.
  - Engineered theft detection and video understanding proof of concept solutions using LVMs, LLMs, and multi-agentic frameworks for retail customers.
  - Leveraging Gen-AI and LLMs to drive innovation within Intel's distributed edge infrastructure platform group.
  - Architecting a versatile, AI-powered front-end interface for the Networking and Edge(NEX) Business Unit, catering to a wide range of users.
  - Familiar and worked with NVIDIA's software libraries, platforms and frameworks such as Neural Module(NeMo), NVIDIA Inference Microservices(NIM), RAPIDS, CUDA, e.t.c.
- **Lawrence Berkeley National Laboratory** *June 2022 - Jan 2023*
  Computational Research Engineer/Scientist Berkeley, CA
  Key projects:
  - CRD-NERSC Supporting Workflows: Focused on advancing intelligent scientific workflow data management at the National Energy Research Scientific Computing Center (NERSC), with an emphasis on real-time stream processing and data provenance, contributing to optimized and efficient scientific computing processes.
  - QUANT-NET (Quantum Application Network Testbed for Novel Entanglement Technology): Developed a proof-of-concept quantum network linking Berkeley Lab and UC Berkeley, featuring entanglement swapping over optical fiber and managed by a quantum network protocol stack. Collaborated with leading experts from Berkeley Lab, UC Berkeley, and Caltech to demonstrate entanglement between small-scale quantum computers.
  - Securing Automated, Adaptive Learning-Driven Cyber-Physical Systems: Built self-driving synthetic biology labs using ML processes and Bayesian ensemble modeling through the Automated Recommendation Tool (ART) to secure and optimize cyber-physical system processes.
- **Lawrence Berkeley National Laboratory** *April 2019 - May 2022*
  Postdoctoral Research fellow, Berkeley, CA
  - Led the "Large-scale Deep Learning for Intelligent Networks" project at Berkeley Lab, funded by the US Department of Energy, where I developed AI and ML algorithms to optimize the control of distributed network resources, enhance high-speed data transfers, and minimize network downtime for exascale scientific workflows..
  - Achieved significant recognition with publications in top networking conferences and journals, including a Best Paper Award at the Machine Learning for Networking Conference.
  - Co-authored the "Deep Learning Based Control for Ultrafast Lasers and Accelerators (DL4ACC)" project at Lawrence Berkeley National Lab, funded by the US DOE. Contributed to a novel approach for deep learning-based control of ultrafast lasers and accelerators, resulting in four publications at the Advanced Solid-State Laser Conference.
- **AI Collaborator, Inc** *Jan 2021 - May 2022*
  Head of AI and Lead Technical Product Manager, Los Angeles, CA
  - Spearheaded the development and execution of the AI strategy, driving innovation across products and services, and ensuring alignment with business objectives and market trends.
  - Oversaw the end-to-end product lifecycle, from ideation to launch, for AI-driven solutions, ensuring timely delivery, market fit, and customer satisfaction.
  - Managed and mentored a cross-functional team of engineers, data scientists, and product managers, fostering a collaborative environment that maximized productivity and innovation.

Education

- **University of Bradford, UK** *Nov 2014 - July 2019*
  PhD in Computer Science UK
  ◦ Advisors: Prof. Hassan Ugail and Prof. Irfan Awan
- **University of Sheffield, UK** *Sep 2010 - Feb 2012*
  MSc in Control Systems Engineering UK
  ◦ Advisors: Prof. Peter Fleming and Dr. Andy Mills (Rolls Royce Group, UTC, Sheffield).

Skills

- **Programming Languages:** Python, C, CSharp, Java, MATLAB, SQL.
- **Databases:** SQL, MongoDB, InfluxDB, Postgres, ChromaDB, Intel VDMS.
- **Packages and Libraries:** Langchain, LanGraph, Haystack, NumPy, SciPy, Pandas, TensorFlow, Keras, Theano, Caffe, PyTorch, NetworkX, PyTorch, SciKit-Learn, CUDA.
- **Techniques:** Retrieval-Augmented Generation (RAG), Deep Learning, Optimization, Data Visualization
- **General Tools and Platforms:** Linux, Git, Shell Scripting.
- **Mathematics:** Strong foundation in Engineering Mathematics and Industrial Mathematics, with expertise in Control Systems, Differential Equations, Probabilistic and Statistical Modeling
- **Artificial Intelligence and Machine Learning:** Expertise in Generative AI (Gen-AI), Large Language Models (LLM), Large Vision Models (LVM), and Multi-Agent frameworks.
- **Predictive Modeling and Forecasting:** Time Series Forecasting and Statistical Modeling.
- **Supervised Learning:** Classification, Regression, Dimensionality Reduction, Structured Prediction, and Anomaly Detection.
- **Unsupervised Learning:** Clustering (Hierarchical Clustering), Anomaly Detection (Local Outlier Factor), and Incremental Clustering of Large Databases.
- **Neural Networks:** Expertise in Generative Adversarial Networks (GANs) and Reinforcement Learning.

Honors and Awards

- **SIAM Science Policy Fellowship Award 2023** *Jan 2023*
  Society of Industrial and Applied Mathematics (SIAM) [LINK]
  ◦ As a Science Policy Fellow, I actively represent the SIAM community to policymakers in Washington, D.C., advocating for the critical role of mathematics and computational science in shaping informed policy decisions.
- **Black and Brilliant and Codecademy AI Accelerator Coaching Award** *Feb 2021*
  Codecademy [LINK]
  ◦ Selected as a Data Science and AI Coach for the Black and Brilliant AI Accelerator Course in partnership with Codecademy.
- **Black and Brilliant and Codecademy AI Accelerator Coaching Award** *Feb 2021*
  Codecademy [LINK]
  ◦ Selected as a Data Science and AI Coach for the Black and Brilliant AI Accelerator Course in partnership with Codecademy.
- **Exceptional Talent Digital Technology UK Government Endorsement Award** *Feb 2020*
  Tech Nation [LINK]
  ◦ Endorsed by the UK government as a World-Leading Expert in Digital Technology under the Exceptional Talent program.
- **Berkeley Lab Research SLAM Award Winner** *Sep 2019*
  Lawrence Berkeley National Lab [LINK]
  ◦ I am honored to have earned second place in the prestigious Berkeley Lab Research SLAM contest.
- **Berkeley Lab Research SLAM Finalist** *Sep 2019*
  Lawrence Berkeley National Lab [LINK]
  ◦ Selected as a finalist in the prestigious Berkeley Lab Research SLAM competition, standing out among 42 early-career researchers.
- **The IYPT Elemental Slam Award on Capitol Hill** *Oct 2019*
  US Department Of Energy/ UC Berkeley [LINK]
  [LINK]
  ◦ Winner of the Berkeley Lab Research SLAM and selected to represent Berkeley Lab at the IYPT Elemental Slam on Capitol Hill, where I had the privilege of presenting my research to legislators and a Capitol Hill audience. Notable attendees included Senators Lisa Murkowski (Alaska), Bruce Westerman (Arkansas), and Randy Weber (Texas).