Basharat Hussain

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Location: Wah Cantt, 44070 Pakistan

Highlights

Accomplished Software Professional with 20+ years in software development, software engineering, AI/ML systems, and enterprise architecture. Recent focus on applied deep learning, LLM fine-tuning, federated learning, and intelligent transportation systems. Proven experience leading AI-driven product development and research in international, cross-functional environments. Adept in transforming complex business requirements into scalable, ML-powered solutions.
PhD in computer science from COMSATS University, and M.S. in computer science from International Islamic University, Islamabad, Pakistan. Senior IT specialist having experience developing software applications for multinational companies in Europe and the USA. Professional experience in software design and architecture using various languages, including Python, C++, C#, ASP.NET Core, Java, and HTML. Current research interests include applying deep learning, machine learning and federated learning to solve ongoing problems in intelligent

Experience

Self-Employment/Consultancy/Personal Projects

➜ **Consultant, LLM/AI & Data Scientist** at **2iQ Financial Services** (Jan 2025 – Apr 2025) Lahore, Pakistan

Role: As an AI and LLM Consultant at 2iQ, improved structured data extraction from financial filings with LLM pipeline, achieving 94% precision on benchmark set. As a data scientist, developed and fine-tuned ML models combined with rule-based systems to ensure high data accuracy and visualizations. Leveraged clustering techniques to identify patterns and inconsistencies to eliminate anomalies in financial datasets, enabling automated correction and improved quality.

➜ **Partner & CTO** at **FindVaccineNow LLC** (Dec 2020 – Jan 2024) TX, United States

Role: Led the development of a highly scalable, global COVID-19 vaccine tracking platform, ensuring accurate and accessible data. Built platform that connects individuals and businesses with providers offering COVID-19 vaccines, testing, and treatments. Accessible in over 135 countries. Built on a crawler-centric architecture that efficiently aggregates and organizes real-time vaccination data. Partnered with industry leaders such as Apple to deliver a flexible, reliable solution tailored to the needs of an international audience.

➜ **Architect / Lead (Offshore at Royal Brackets)** at **Put & Track** (Aug 2019 – Oct 2020) Arhus, Denmark

Role: Designed the back-end using Service Oriented Architecture. Led the development of a real-time asset tracking system. Implemented SignalR for instant notifications in ASP.NET Core. Utilized MongoDB for efficient schema design, ensuring scalability. Ensured reliable performance through rigorous testing practices.

➜ **Founder & CEO** at **Royal Brackets Technology** (Jul 2019 – May 2023) Islamabad, Pakistan

Role: Provided software solutions to foreign clients.

➜ **Chief Architect (Full-time)** at **Route Trading** (Aug 2016 – Oct 2020) London, UK

Role: Managed Product Architecture & Design from Inception till Releases. Identified Business & Stakeholder Requirements, and transformed them into Technical Specs. Standardized code, conducted code reviews, ensured system alignment. Controlled DevOps and CI/CD pipelines using VSTS.

Full-time Employment

➜ **Lead / Software Developer (Full-time)** at **Integrated Enterprises** (Mar 2017 – Feb 2019) Islamabad, Pakistan

Role: Delivered EconoRepairs project under tight deadlines. Developed a B2B mobile repair solution with payment integration. Ensured seamless functionality for a multi-location rollout. Integrated diverse payment options including PayPal, Stripe, ACH.

➜ **Tech Lead & Principal Software Engineer (Full-time)** at **Synergy Pakistan** (Jan 2013 – Aug 2016) Islamabad, Pakistan

Role: Led publishing system development for Danish clients. Played roles of Project Lead, Architect, and problem-solver. Applied Microservices, ASP.NET MVC/Web API, HTML, JavaScript, UML.

➜ **Solution Architect & Principal Software Engineer (Full-time)** at **TEO International** (Apr 2010 – Dec 2012) Islamabad, Pakistan

Role: Delivered business solutions and CMS with Sitecore, ASP.NET. Supervised teams and was part of Code Helper QA group. Delivered Gyldendal Uddannelse project (3200 man-hours) under tight deadlines.

➜ **Software Architect & Technical Lead (Full-time)** at **Ciklum Pakistan** (Feb 2005 – Apr 2010) Islamabad, Pakistan

Role: Led insurance platform 'European Insurance' project. Conducted business requirement sessions in Denmark. Developed a P2P file sharing engine for 'Eovendo' using C++/STL.

➜ **Senior Software Engineer (Full-time)** at **Workplains (pvt). ltd.** (Oct 2002 – Apr 2005) Islamabad, Pakistan

Role: Designed and developed WORK+ rule-based workflow engine. Applied VC++, COM/DCOM, STL, VB6, SQL Server, and DB2.

➜ **Software Engineer (Full-time)** at **Buraq Integrated Solutions** (Nov 2001 – Jul 2002) Islamabad, Pakistan

Role: Worked on Document Management System modules using C++, VC++ 6, COM.

Team Management Experience

Accomplished Software Professional with 20+ years in software development, software engineering, AI/ML systems, and enterprise architecture. Recent focus on applied deep learning, LLM fine-tuning, federated learning, and intelligent transportation systems. Proven experience leading product development and research in international, cross-functional environments. Adept in transforming complex business requirements into scalable, ML-powered solutions.

Consulting Delivery and Inception Phase Involvement

➜ Publishing Industry: Contributed to the development of services and solution accelerators for Gyldendal Client on Product Recommendation, Ideation, Database analysis and Connected architecture

➜ Covid Dashboard: Developed and deployed FindVaccineNow portal and supported maintenance of a tracking COVID cases across 125 counties. One of the successful project where data is transferred to the top level company in the digital world - Apple

➜ Banking, Financial and Remittance Sector: Participated in business analysis and effort estimations for use-cases of several banking and financial sector clients. Led a team of developers from inception till final release with Route Trading in FinTech space, such as Anit-Money Laundering and Customer Compliance

➜ Manufacturing: EconoRepairs project was delivered under tight deadlines by developing a B2B mobile repair solution with payment integration and merchant transaction support, targeted for deployment across multiple

locations in Texas, USA. Led product design and development, ensuring smooth roll-out across multiple sites

Skills

➜ Python; C/C++; C#; ASP.NET; Java; Shell Scripting; Numpy; Pandas; Scikit-Learn; Pytorch; TensorFlow; Hugging Face; Docker; Git; SQL

➜ Supervised and Unsupervised Machine Learning; Statistical, Mathematical Modeling & Optimization; Search-based Optimization; Image Processing; Computer Vision; Time series forecasting; NLP; Autonomous Vehicles; Graph Neural Networks

➜ GenAI; LLM; Deep Learning; Probabilistic Reasoning; Software Engineering using structured and Object-oriented Programming;

➜ Cloud Computing; AWS, Azure, MongoDB, REST APIs, Microservices, DBMS, Database programming, Data Migration, Backup & Recovery

Industries Served

Insurance; Transport & Logistics; Health Care; Publishing; Research & Education; Retail; Banking; FinTech; Manufacturing; Anti-Money Laundering

Background in AI & ML Development

➜ Autonomous Vehicles: Completed Ph.D. while being developed Intelligent Transportation Applications. Practical experience and theoretical knowledge working and solving logical problems. Developed own frameworks in Python encompassing state-of-the-art problem solving techniques. Good experience with autonomous vehicle problems during academic discourse.

➜ LLM Model Fine-tuning: Improved structured data extraction from financial reports using a custom LLM pipeline, achieving higher precision on benchmark datasets at 2iQ Financial Services. Developed and fine-tuned ML models and integrated rule-based systems for high-accuracy data extraction and insightful visualizations. Applied clustering techniques to detect patterns and anomalies in financial datasets, enabling automated corrections and quality improvements

➜ Data Science: Taught data mining, machine learning and and cloud computing for computer science students at post-graduate level. Carried out and led several industrial projects in the field of AI, ML and data science.

➜ Software Development: Coding experience in C#, C++ and OOP spans 20+ years. Started career as Software Engineer to Solution Architect. Later all of research work required development of complex code using C++ and Python, solving complex scientific problems. Taught programming courses, courses on software design and architecture, data structures, software engineering and cloud computing. Skilled in industrial scale software development and an active hands-on programmer in C++, Java, Python, SQL and several others.

Publications in Artificial Intelligence

Published in the top-rated journals and conferences in the field of Artificial Intelligence solving some of the complex problems in artificial intelligence. Conducted state-of-the-art research in the field of Autonomous Vehicles. Research has been cited by researchers in the field of Artificial Intelligence. Development of federated learning and graph neural networks was done in Python. Research papers available at Google Scholar.

➜ **Optimizing Urban Traffic Incident Prediction with Vertical Federated Learning: A Feature Selection based Approach**, IEEE Transactions on Network Sci. & Eng., Jan 2025, 10.1109/tnse.2024.3487268.
Authors: ***Basharat Hussain***, Muhammad Khalil Afzal

➜ **A Novel Graph Convolutional Gated Recurrent Unit Framework for Network-based Traffic Prediction**, IEEE Access, Nov 2023, 10.1109/access.2023.3333938.
Authors: ***Basharat Hussain***, Muhammad Khalil Afzal, Sheraz Anjum, Imran Rao, Byung-Seo Kim

➜ **Intelligent Traffic Flow Prediction Using Optimized GRU Model**, IEEE Access, Dec 2022, 10.1109/access.2021.3097141.
Authors: ***Basharat Hussain***, Muhammad Khalil Afzal, Shafiq Ahmad, A. M. Mostafa

Education

➜ **Ph.D. (CS/Artificial Intelligence, 2025)** | COMSATS University, Islamabad

- Areas: Artificial Intelligence, Deep Learning, Federated Learning, Intelligent Transportation, Large Language Models, Neural Networks, Data Analysis, Cloud Computing
- Thesis Title: Traffic Flow Prediction using Deep Neural Networks: A Cluster-based Federated Learning Approach

➜ **MS in Computer Science, 2016**, International Islamic University, Islamabad

- CGPA: 4.0/4.0 (*With Distinction*)
- **Coursework:** Image Processing, Data Mining, Computational Intelligence

➜ **M.Sc. in Computer Science, 2001**, International Islamic University, Islamabad

- CGPA: 3.57/4.0
- **Coursework:** Computer Architecture, Comparison of Learning Algorithms, Computational Theory, Visual Programming

➜ B.Sc. | University of Punjab (Govt. Asghar Mall College Rawalpindi)

- **Coursework:** Mathematics and Physics

Certifications & Open-Source Platforms

Coursera Course: **Introduction to Machine Learning on AWS** - April 2024, AWS
Coursera Course: **Introduction to Machine Learning** - September 2020, Duke University
Coursera Course: **Automated Reasoning** - October 2020, Eit Digital

Academic Teaching & Mentoreship

➜ **National University of Computer and Emerging Sciences (FAST NUCES)**, Assistant Professor Jan 2024 – Now

- **Coursework:** Cloud Computing, Data Mining, Software Design and Analysis, Machine Learning

➜ **Riphah International University**, Senior Lecturer (Full-time) Feb 2020 – Jan 2024

- Cloud Computing, Advanced System Software Architecture, Software Design and Architecture, Java, .NET/C#