MUHAMMAD RIZWAN | PhD | PMP & AWS Certified

IT Professional | High-Performance Computing Researcher | 14+ Years Experience

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Professional Profile

I am Muhammad Rizwan, a dynamic Computer Science professional with over 14 years of comprehensive experience in enterprise software development, IT governance, and High-Performance Computing (HPC) research. I excel at transforming complex technical challenges into scalable, business-driven solutions.

My career spans impactful leadership roles as Senior Program Manager, Project Manager, Deputy Manager IT, and Principal Software Engineer at renowned organizations including Punjab Information Technology Board (PITB), Punjab Masstransit Authority (PMA), Techlogix, NimbleGeeks, and MTBC. I have successfully led enterprise-scale implementations, driven digital transformation in Pakistan's public sector, and managed integrated technology platforms supporting critical infrastructure.

I recently completed my PhD in Numerical Computing from Soongsil University, Korea, focusing on Kokkos-optimized benchmarks for scientific computing using performance-portable HPC techniques. I have contributed patented bioinformatics tools to the open-source community, with publications in prestigious journals such as IEEE, Elsevier, Springer, and BMC.

Technical Skills

Programming Languages: C, C++, Java, C#, Python, Swift, SwiftUI, TypeScript, JavaScript

Scripting & Web Technologies: SQL, Shell scripting, LaTeX, HTML, CSS, Canvas

Frameworks & Backend: React, Angular, GWT, Swing, JSP, .NET Framework, Entity Framework, Hibernate, ORM, AJAX, XML, XPath, XSLT, XSD, XQuery, DOM

Cloud & Enterprise: AWS, Azure, Oracle PeopleSoft, IBM Lombardi, SQL Server, Oracle RDBMS

HPC & Scientific Computing: High-Performance Computing (HPC), Kokkos (Performance Portability), Numerical Computing, Optimization, Scientific Computing, Bioinformatics

Mobile Development: iOS Development (Swift, SwiftUI)

Project Management: PMP Certified, Agile Methodologies, Jira, Trello, Microsoft Project, Confluence, Team Leadership, Stakeholder Management

R&D Expertise: Critical Analysis & Problem Solving, Research & Development (R&D), Software Product Development, Process Engineering & System Development, Technical Writing & Documentation

Professional Experience

Soongsil University **Seoul, Korea**
Research Assistant *2021 – 2025*

- Conducted cutting-edge research on Kokkos-optimized benchmarks for scientific computing applications
- Developed KoHPCG (High-Performance Conjugate Gradient) benchmark program for performance evaluation
- Optimized SpMV (Sparse Matrix-Vector Multiplication) and SymGS algorithms for enhanced computational efficiency
- Implemented performance-portable HPC techniques for Intel KNL and SKL multiprocessors
- Published research findings in prestigious journals including IEEE and Springer
- Presented research at international conferences and academic symposiums

Punjab Information Technology Board (PITB) **Lahore, Pakistan**
Senior Programme Manager *Nov 2020 – Apr 2021*

- Led eFOAS and iPAS projects for the Government of Punjab, digitizing public sector document management
- Collaborated with multiple stakeholders to support project goals and ensure successful implementation
- Managed cross-functional teams and coordinated with government departments
- Projects: eFOAS (e-Filing and Office Automation System), iPAS (Intelligent Project Automation System)

NimbleGeeks **Islamabad, Pakistan**
Software Project Manager *Aug 2019 – Nov 2020*

- Managed development teams and contributed to software development for web and mobile projects
- Implemented agile methodologies and best practices for project delivery
- Coordinated with clients and stakeholders to ensure project requirements were met
- Projects: Stock Market Application (real-time analytics), Islamic Shariah Council System (UK)

Punjab Masstransit Authority **Multan, Pakistan**
Deputy Manager IT *Aug 2016 – Aug 2019*

- Oversaw comprehensive IT governance and contract management for Rapid Bus Transit System
- Managed critical infrastructure including E-Ticketing, Surveillance, Public Address, Firewall, Cloud, and GPON-based optical fiber network
- Led IT Wing Administration, Data Center operations, and IT staff management
- Ensured system reliability and security for public transportation services

Techlogix **Lahore, Pakistan**
Principal Software Engineer *Mar 2011 – Aug 2016*

- Developed and delivered enterprise applications across multiple domains, from analysis to deployment
- Led technical architecture design and implementation for large-scale systems
- Mentored junior developers and conducted code reviews
- Projects: Campus on Cloud (Azure), PeopleSoft Campus Management, Middleware Implementations, Online Admissions Application

NimbleGeeks **Islamabad, Pakistan**
Associate Software Engineer *Dec 2010 – Mar 2011*

- Contributed as a web developer on various client projects
- Implemented responsive web designs and interactive user interfaces

Medical Transaction Billing Company (MTBC) **Rawalpindi, Pakistan**
Software Engineer *Jun 2010 – Oct 2010*

- Assisted in designing and implementing software testing and evaluation policies
- Developed automated tools for operations and participated in EDI processes for medical billing
- Contributed to quality assurance and process improvement initiatives

National University of Computer and Emerging Sciences **Islamabad, Pakistan**
Teacher's Assistant *Jan 2009 – Dec 2009*

- Served as Teacher's Assistant for Theory of Automata and Numerical Analysis courses
- Conducted laboratory sessions and quizzes for undergraduate students
- Evaluated student quizzes, assignments, and term projects
- Provided academic support and guidance to students

National ICT Research and Development Fund (Ministry of IT) **Pakistan**
Quality Assurance Officer *Jun 2007 – Jul 2007*

- Worked as Quality Assurance Officer Intern in a scholarship program for talented students from rural/non-metropolitan areas
- Managed and monitored applicants training program in Chishtian Mandi, District Bahawalnagar, Punjab
- Contributed to developing human resource capacity in Information and Communication Technologies (ICT) in Pakistan

Education

Soongsil University **Seoul, Korea**
PhD in Numerical Computing / HPC, CGPA: 4.12/4.5 *2025*
Thesis: KoHPCG – High-Performance Conjugate Gradient Benchmark Program on Kokkos Performance Portability Framework

National University of Sciences and Technology **Islamabad, Pakistan**
MS Computational Sciences, CGPA: 3.6/4.0 *2016*
Thesis: High Throughput In Silico Pipeline to Discover Potential Therapeutic Targets in Prokaryotic Pathogens

National University of Computer and Emerging Sciences **Islamabad, Pakistan**
BS Computer Science, CGPA: 3.28/4.0 *2010*
Final Year Project: Automatic Generation of Interesting Game (AGIG)

Bahauddin Zakariya University **Multan, Pakistan**
BSc Mathematics and Physics, Fourth position in college *2006*

Research

HPC Research: Focus on performance optimization of scientific computing applications using Kokkos, a performance portability library for parallel programming. Specialize in matrix operations optimization on Intel KNL and SKL multiprocessors, QR factorization performance tuning, conjugate gradient benchmark development, performance-portable HPC techniques, SpMV/SymGS optimization, and benchmark development and analysis.

Bioinformatics & Genomic Computation: Developed patented bioinformatics tools for vaccine target discovery: VacSol (High-throughput in silico pipeline for therapeutic target prediction) and PanRV (Pangenome-reverse vaccinology approach for vaccine candidate identification). Open-source contributions to the bioinformatics community.

Publications

Revisiting the performance optimization of QR factorization on Intel KNL and SKL multiprocessors.
Journal of Supercomputing, 2024. DOI

Pangenome analysis and reverse vaccinology of XDR Salmonella typhi strain from Pakistan identified novel vaccine targets.
International Journal of Infectious Diseases / Elsevier, 2020. DOI

PanRV: Pangenome-reverse vaccinology approach for identifications of potential vaccine candidates in microbial pangenome.
BMC Bioinformatics, 2019. DOI

VacSol: A high throughput in silico pipeline to predict potential therapeutic targets in prokaryotic pathogens based on subtractive reverse vaccinology.
BMC Bioinformatics, 2017. DOI

Optimization of Matrix-Matrix Multiplication Algorithm for Matrix-Panel Multiplication on Intel KNL.
IEEE/ACS, 2023. DOI

Text-Conditioned Diffusion Model for High-Fidelity Korean Font Generation.
2025 International Conference on Information Networking (ICOIN). DOI

Presentations: **OpenMP-Parallel SymGS Variants for the 27-Point Stencil Problem on Many-Core Systems**.
Korean Society of Computational Science and Engineering Spring Conference 2025 (Oral Presentation)

Porting HPCG to Kokkos for Enhanced Portability and Performance.
Korean Society for Computational Science and Engineering Conference 2024 (Oral Presentation)

High Performing Matrix–Panel Multiplication Routine on Intel Processor with AVX-512 Instructions.
Korea Computational Science and Engineering Society Conference 2022 (Poster Presentation)

***Note:** Three more papers are currently submitted and under review.

Patents

VACSOL: Reverse Vaccinology Pipeline (PK 44121-Copr, Issued September 2021)
Literary work (computer program) entitled "VacSol," a reverse vaccinology pipeline.

PANRV: Pangenome Reverse Vaccinology Pipeline (PK 44122-Copr, Issued September 2021)
Literary work (computer program) entitled "PANRV," a pangenome reverse vaccinology pipeline.

Awards & Recognition

2021: International Graduate Research Scholarship, Soongsil University

2006: Merit Scholarship, National ICT R&D Fund, Ministry of IT

2010: Dean's List of Honors, Spring 2010

2015: Qualified for Final Phase of FICS, NUST

Professional Certifications

PMP: Project Management Professional, Project Management Institute (PMI)

AWS: AWS Cloud Practitioner, Amazon Web Services (AWS)

Languages

Proficient: English, Urdu, Punjabi

Beginner: Arabic, Korean (Basic - Can't communicate properly)

References

Available upon request.