Abdul Rehman

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Education

- **Lahore University of Management Sciences (LUMS)** — Lahore, Pakistan
  Auditing, Computational Neuroscience — *Starting August 2024*
  - **Courses**: Computational Biology II, Applied Probability, Design and Algorithms, Distributed Systems, Deep Learning, Human Computer Interaction, Algorithmic Foundations of Big Tech
  - **Skills**: Computer Science, Health Informatics, Neuroscience, Bioinformatics, Proteomics, Machine Learning, Algorithms
- **Forman Christian College (FCCU)** — Lahore, Pakistan
  Master's Degree, Computer Science — *Starting September 2024*
  - **Courses**: Data Mining, Advanced Machine Learning, Algorithmic Thinking, Research Methodology, Theory of Computing, Theory of Programming
  - **Skills**: Bioinformatics, Advanced Machine Learning
- **National University of Computer and Emerging Sciences (FAST-NUCES)** — Lahore, Pakistan
  Bachelor's Degree, Computer Science — *August 2019 – July 2023*
  - **Skills**: Computer Science
- **Punjab Group of Colleges (PGC)** — Lahore, Pakistan
  Intermediate, Pre-Engineering — *March 2017 – March 2019*
  - **Grade**: A+ (Merit-Scholarship Student)
- **KIPS School & Colleges** — Lahore, Pakistan
  Matric — *March 2015 – March 2017*
  - **Grade**: A+ (Merit-Scholarship Student)

Experience

- **Lahore University of Management Sciences (LUMS)** — Lahore, Pakistan
  Teaching Assistant (Part-time) — *Aug 2024 – Present (10 months)*
  - **Department**: Department of Computer Sciences, Department of Life Sciences
  - **Course**: Computational Biology II, Big Data Services and MLops
  - **Skills**: Python (Programming Language), Microsoft Azure, Databricks, Fabrics, Power BI
- **Lahore University of Management Sciences (LUMS)** — Lahore, Pakistan
  Research Assistant (Full-time) — *Jul 2024 – Present (11 months)*
  - **Department**: Neuroscience, Biomedical Informatics & Engineering Research Laboratory (BIRL), Department of Life Sciences
  - **Skills**: Health Informatics, Computer Science, Neuroscience
- **Forman Christian College (FCCU)** — Lahore, Pakistan
  Research Assistant (Part-time) — *Sep 2024 – Present (9 months)*
  - **Department**: Department of Computer Sciences
  - **Skills**: Health Informatics, Neuroscience
- **National University of Computer and Emerging Sciences (FAST-NUCES)** — Lahore, Pakistan
  Research Assistant (Part-time) — *Feb 2024 – Feb 2025 (1 Year)*
  - **Department**: Department of Computer Sciences
  - **Skills**: MATLAB, Python (Programming Language), Computer Science, IBM SPSS, Blender, OpenCV
- **National University of Computer and Emerging Sciences (FAST-NUCES)** — Lahore, Pakistan
  Lab Instructor (On-site) — *Aug 2023 – Jul 2024 (1 year)*
  - **Department**: Department of Computer Sciences
  - **Taught Subjects**: Artificial Intelligence (2 sections), Data Mining (2 sections), Data Structures, Data Visualization and Analysis, Operating Systems (2 sections), Object-Oriented Programming, Programming Fundamentals
  - **Skills**: Computer Science, , Python (Programming Language), R (Programming Language), Linux, Weka, C++ / C (Programming Language), Lisp, Shell Scripting

- **National University of Computer and Emerging Sciences (FAST-NUCES)** Lahore, Pakistan
  Teaching Assistant (On-site) *Aug 2023 – Jul 2024 (1 year)*
  - **Taught Subjects**: Blockchain, Data Science, Fundamentals of Computer Vision, Information Security, Internet of Things (2 sections), Natural Language Processing (2 sections), Quantum Computing (2 sections)
  - **Skills**: Python (Programming Language), C++, Computer Science, Qiskit, Arduino, Go (Programming Language), Proteus, Microsoft Azure, Microsoft SQL Server
- **Research Assistant — FAST-NUCES** Lahore, Pakistan
  Research Assistant *Aug 2023 – Jan 2024*
  - **Research Areas**: Quantum Computing, Operations Research, Internet of Things, Cloud Computing, Computer Vision
- **Research Assistant — FAST-NUCES** Lahore, Pakistan
  Research Assistant *Feb 2024 – Jul 2024*
  - **Research Areas**: Natural Language Processing, Internet Of Things, Research Operations

Research and Development Projects

- **Biomedical Informatics and Engineering Research Laboratory (Dr. Safee Ullah Chaudhary, PhD, LUMS)**: Worked as a Research Assistant contributing to cross-disciplinary neuroscience and biomedical informatics projects integrating computer science, hardware systems, and AI techniques.
  - **BRACE Grant Proposal**: Contributed to grant writing, leading technical methodology sections, organizing pilot study documentation, and maintaining collaboration workflows using Mendeley and Dropbox.
  - **SZ Brain Connectivity Analysis**: Conducted research on functional connectivity patterns in Schizophrenia (SZ) patients using fMRI datasets, focusing on network disruptions and brain region correlation analysis.
    * **Dataset Handling**: Preprocessed fMRI datasets of SZ patients using SPM12, ensuring alignment, normalization, and artifact correction to maintain high data fidelity.
    * **Connectivity Analysis**: Applied correlation matrices, ROI-based approaches, and seed-based methods to examine disrupted brain networks, particularly in the Default Mode Network (DMN) and Fronto-Parietal Network (FPN).
    * **Technical Implementation**: Developed MATLAB scripts for brain connectivity visualization; explored emerging techniques like graph theory measures and machine learning classifiers to detect connectivity differences between SZ patients and healthy controls.
    * **Reporting and Documentation**: Compiled research findings into organized reports, prepared figures for presentations, and drafted initial documentation for potential publication.
  - **ADHD Identification Project (Seiko Epson Corporation, Pakistan)**: Worked on a multi-phase ADHD identification project to detect ADHD in marginalized children and implement personalized interventions.
    * **Phase 1**: Conducted real-time classroom monitoring using wearable sensors to assess students' Stress, Attention, and Distraction (SAD) scores.
    * **Phase 2**: Used EEG for cross-validation of data obtained from wearable sensors, focusing on correlation between brain signals and classroom behaviors.
    * **Phase 3**: Incorporated traditional psychological methods, including surveys and interviews, for final confirmation of ADHD diagnosis.
    * **Goal**: Aimed to enhance ADHD detection accuracy and improve learning outcomes by providing tailored intervention strategies for children.
- **Biomedical Informatics Engineering Research Laboratory (Dr. Safee Ullah Chaudhary, PhD, LUMS)**: Emergency Expert is a healthcare platform designed to enhance access to medical services during life-critical situations. The system allows patients to input their symptoms through simple binary questions, analyzed using a neural network AI algorithm for rapid and accurate diagnosis. It identifies nearby medical institutes with essential services such as beds, medications, and qualified doctors. The platform provides optimal routes to hospitals using the Google Maps API, reducing wait times and improving patient outcomes. Shortlisted in Ignite National Championship, it stood out among 25,000 FYPs across Pakistan.
- **Emergency Expert (Dr. Ali Afzal, PhD, FAST-NU)**: Emergency Expert is a healthcare platform designed to enhance access to medical services during life-critical situations. The system allows patients to input their symptoms through simple binary questions, analyzed using a neural network AI algorithm for rapid and accurate diagnosis. It identifies nearby medical institutes with essential services such as beds, medications, and qualified doctors. The platform provides optimal routes to hospitals using the Google Maps API, reducing wait times and improving patient outcomes. Shortlisted in Ignite National Championship, it stood out among 25,000 FYPs across Pakistan.
- **REX: The Self-Navigating AI-based Quadruped Robot (Dr. Arshad Ali, PhD, FAST-NU)**: REX is a cost-effective quadruped robot designed for versatile applications using servo motors, sonar sensors, and 3D printing. It autonomously navigates terrains using sensory inputs and adapts its movements. Integrated with YOLO technology and cloud computing, REX maps environments and optimizes paths, making it ideal for tasks like search and rescue, exploration, and military reconnaissance.

- **Hyper Learning Binary Political Optimizer (Dr. Maryam Bashir, PhD, FAST-NU)**: HLBPO is a feature selection algorithm enhancing the Political Optimizer with hyper-learning techniques. Tested on 21 datasets, HLBPO outperforms nine leading algorithms by selecting essential features, increasing classification accuracy, and reducing processing time. Its efficiency highlights its potential for machine learning applications.
- **Multi-level, Multi-stage Lot-sizing and Scheduling in Flexible Flow Shop with Demand Information Updating (Dr. Hakeem Rehman, PhD, PU)**: This study develops a mixed-integer programming model to minimize production and inventory costs in automobile manufacturing, incorporating evolving demand information. Utilizing a martingale model for forecasting, three heuristic algorithms are introduced to solve this NP-hard problem, with Heuristic 1 showing superior performance in optimizing production scheduling.
- **Qiskit Language Compiler (Dr. Faisal Aslam, PhD, FAST-NU)**: The project developed an enhanced quantum programming language compiler, improving performance over Qiskit. The compiler optimizes syntax and execution models for faster quantum algorithm implementation, simplifying the quantum development process and making it a valuable tool for researchers.
- **Telecom Identity Revealer**: This project extracts comprehensive ownership details linked to Pakistani phone numbers. It successfully identified details for 180 million out of 240 million numbers, offering insights into telecommunication patterns and ownership. The tool provides full name, address, CNIC, and lists of active numbers, aiding in the understanding of telecom usage in the region.

Programming Skills

- **Languages**: MATLAB, Python, R, C++/C/C#, Lisp, Shell Scripting, Go, Qiskit, Arduino, JavaScript, Shell Script, SQL, Assembly, HTML/CSS, AMPL, Rust, Kotlin, Swift
- **Tools**: Arduino, Blender, Visual Studio, Visual Studio Code, Azure, Postman, MSSQL, MySQL, Figma, Adobe Illustrator, Github Desktop, Matlab, MRIcro, RPNext, Weka, Linux, Proteus, Qiskit, IBM SPSS, EEGLAB, BCI, Anaconda, Databricks, Ganache, Kali Linux, YOLO, Wireshark, NASM/MASM, Mingw, Logic Works, TinkerCAD, Virtual Box, Android Studio, Xcode, LaTeX, Google Colab, Git
- **Frameworks**: Angular, MERN, Flutter, React, Django, Flask, Node.js, TensorFlow, PyTorch, Express.js, Spring Boot, .NET, Vue.js, Next.js

Languages

- **Urdu**: Native Proficiency
- **Punjabi**: Native Proficiency
- **English**: Professional Proficiency (IELTS: 8 Band)

Leadership

- **Team Lead, Neuroscience Dept, Biomedical Informatics & Engineering Research Lab** 2024
  Lahore University of Management Sciences (LUMS) *Lahore, Pakistan*
- **Head Officer, Robo Rumble Dept, SOFTEC** 2022
  National University of Computer & Emerging Sciences (FAST-NU) *Lahore, Pakistan*

Extracurricular Activities

- **Horse Riding** 6-Month Course Degree
  Certified from Local Academy *2022*
- **Chef Training** 6-Month Professional Course Degree
  COTHM (College of Tourism & Hotel Management) *2022*