Abdul Basit Khattak

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Education

Lahore University of Management Sciences (LUMS) 09/22 – Present (Anticipated: 05/26)
BS – Computer Science (Advised by Imdadullah Khan)

- Completed nine teaching assistantships during undergraduate studies.
- Relevant Coursework: Advanced Programming, Algorithms, Applied Probability, Calculus II, Data Structures, Deep Learning, Distributed Systems, Dynamic Programming & Reinforcement Learning, Foundations of Generative AI, Linear Algebra, Network Centric Computing, Network Security, Operating Systems, Principles and Techniques of Data Science, Software Engineering, Statistics & Data Analysis.

Islamia College Peshawar 09/20 – 05/22
High School (Subjects: Maths, Phy & Chem) Score: 95.45/100

- Ranked 2nd in graduating batch of 2022.
- Best in Mathematics across the board.

Experience

Lahore University of Management Sciences 09/23 – Present
Undergraduate Teaching Assistant Lahore, Pakistan

- CS360: Software Engineering (Spring 2026)
- DISC325: Business Data Management (Spring 2026)
- CS310/CS5102: Algorithms (Fall 2025)
- CS501/EE515/MATH439: Applied Probability (Fall 2025)
- MATH230: Probability (Spring 2025)
- MATH102: Calculus II (Fall 2024)
- MATH120: Linear Algebra with Differential Equations (Summer 2024)
- MATH101: Calculus I (Summer 2025), (Fall 2023)

Positions of Responsibility

Co-Instructor, Applied Probability (Graduate Level) 09/25 – 12/25
Delivered three lectures and redesigned the course structure and grading scheme. Scheduled and graded quizzes, midterms, assignments, and the final exam. Provided weekly practice problems; held biweekly office hours; managed a slack channel for student queries; and oversaw all contestations to ensure smooth course delivery.

Lead Teaching Assistant, Algorithms 09/25 – 12/25
Led a team of 7 TAs in designing and scheduling all the surprise quizzes and grading quizzes, assignments, and exams for 300+ students. Managed a slack channel for student queries, conducted office hours, and handled all contestations, ensuring smooth communication and support throughout the semester.

Lead Teaching Assistant, Probability 01/25 – 05/25
Led a team of 3 TAs in preparing and grading assignments and quizzes. Conducted weekly office hours and tutorials. Contributed questions to the midterm and the final exam.

Media & Logistics Director, LUMS Students Mathematics Society (LSMS) 09/24 – 05/25
Organized flagship events (*Sigma IX*, *Integration Bee*) to promote problem-solving culture. Managed outreach and collaborations. Designed and maintained LSMS's social media presence (@lsmslums).

Technical Skills

Programming Languages: C++, C, Python, Go, JavaScript **ML/AI:** NumPy, Pandas, Matplotlib, Scikit
Web/App Development: HTML, CSS, Django, React, Next.js, Node.js
Miscellaneous: Git, MongoDB, Data Analysis, Mathematical Modeling, Bash, LaTeX

Projects

Note For You @ LUMS 02/26
Built an anonymous messaging app for verified LUMS emails, letting users send & manage anonymous notes with secure auth and reliable session refresh. Implemented a FastAPI + PostgreSQL backend with JWT access/refresh tokens, email OTP verification, and a React/Tailwind frontend for a smooth UX. Demo
Technologies: React, TypeScript, Tailwind CSS, FastAPI, PostgreSQL, JWT, Axios

Optimizing Multi-Intersection Traffic Signal Control Using Deep RL 11/25 – 12/25
Developed a Dueling Double DQN for multi-intersection traffic signal control in SUMO, optimizing a 117-dim state space via extensive hyperparameter tuning for traffic flow coordination, achieving 98.3% reduction in waiting time, 65% reduction in queue length, and 53% improvement in throughput over fixed-time control. Paper
Technologies: SUMO, Python, PyTorch, Deep RL, Traffic Simulation, Data Analysis

SmartKarting: Race Management & Lap-Time Analytics 11/25
Built a console app for karting event and lap-time management with a flexible business logic layer using LINQ & stored procedures. Leveraged T-SQL, including procedures, queries, partitioning, triggers, and audit logs, to handle over a million rows and deliver fast, detailed driver and session reports.
Technologies: SQL Server/T-SQL, C#/.NET, EF Core

Decarbonizing Pakistan: MESSAGEix Analysis 10/25 – 12/25
MESSAGEix-based energy system modeling of low-emission pathways for Pakistan (2025–2070), assessing a cumulative CO_2 cap, carbon pricing, renewables, CCS, and investment needs under stringent climate targets. Notebook Paper
Technologies: MESSAGEix, GAMS, Python, Optimization Modeling, Data Analysis

Engagement Signals at Scale: Predicting YouTube Trending Speed 10/25 – 11/25
Analyzed 2017/2018; US/UK/CA trending data; engineered timing, text-length, & category features; ran EDA on engagement, country, and category effects. Built and compared regression/ensemble models to predict time-to-trend; evaluated with MSE/MAE/R^2 and saved artifacts for reproducible inference. Notebook
Technologies: Python, pandas, scikit-learn, seaborn/matplotlib, Statistical Testing, ML Evaluation

SALER x SQUID GAME 08/25
Designed a collection of 3 strategic board games inspired by Netflix's *Squid Game*. Features dynamic theming, responsive design, and a custom-built-in music player with persistent cross-page playback and playlist controls. Demo
Technologies: JavaScript, CSS, HTML, GSAP, Web Audio API

ColorGrid 08/25
Developed a real-time multiplayer 5×5 grid game featuring profile customization and global leaderboards. Built server-side matchmaking, robust turn validation, and a flood-fill algorithm for calculating connected-area scores. Introduced coin rewards, persistent game history, and leaderboards to enhance player engagement. Demo
Technologies: React, Node.js/Express, Socket.io, MongoDB, Tailwind CSS, JWT

SmartCart Commerce [Group Project] 01/25 – 05/25
Built a full-stack e-commerce web app with product catalog, shopping cart, and secure checkout. Implemented transactional order processing with inventory and seller payouts, plus workflows for listings, image uploads, and order history. Added AI recommendations, review summaries, and automated confirmations to enhance UX. Demo
Technologies: Next.js, React, TypeScript, Tailwind CSS, PostgreSQL, Supabase

Smart House System 03/24 – 04/24
Engineered an automated home system using LM35 temperature sensors and LDR light detectors to regulate water, lighting, and temperature, maintaining optimal conditions and enhancing energy efficiency and safety. Poster
Technologies: LM35, LDR, Water Level Sensors, Relays, Digital Logic

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