

SOHAIB HASAN

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 Chakwal, Pakistan

Summary

- **9+ years** teaching advanced mathematics to **1,500+** undergraduate students.
- **Top 12% globally** in AI Mathematical Olympiad Progress Prize 3 (495th/4,138 teams, score 42/50).
- **Perfect score (10/10)** at Harvard CS50x Puzzle Day 2026 (166+ countries).
- Actively participating in international hackathons and building production-grade AI systems using LLMs, agentic architectures, and full-stack ML pipelines.
- Creator of PlotLab ([Instagram](#) and [Facebook](#)) — Manim-based mathematical animation channels (45,000+ followers), making advanced mathematics accessible through engaging visualizations.

Education

M.Phil in Mathematics

2018 – 2021

Capital University of Science & Technology (CUST)

Islamabad, Pakistan

- CGPA: 3.40/4.00
- Thesis: *Generalized Signcryption Based on Elliptic Curve Cryptography* ([Link](#))

M.Sc in Mathematics

2015 – 2017

COMSATS University Islamabad

Attock, Pakistan

- Thesis: *Flow of Eyring-Powell Fluid in a Channel Using Adomian Decomposition Method* ([Link](#))

B.Sc in Mathematics

2012 – 2014

Horizon Degree & Commerce College

Chakwal, Pakistan

- Core Coursework: Calculus, Linear Algebra, Mathematical Methods, Metric Spaces, Mechanics

Academic & Professional Experience

Head of Department, Mathematics | [Faculty Profile](#)

June 2024 – Present

Horizon Degree & Commerce College

Chakwal, Pakistan

- Lead academic operations across multiple campuses: faculty assignments, course distribution, and curriculum development.
- Chair departmental seminars on emerging technologies in mathematics and AI, maintaining faculty alignment with current research developments.
- Serve as primary liaison between administration, faculty, and students to sustain instructional quality and resolve departmental challenges.

Lecturer in Mathematics

March 2017 – May 2024

Horizon Degree & Commerce College

Chakwal, Pakistan

- Taught **1,500+** undergraduate students across 9 years in Real Analysis, Measure Theory, Abstract Algebra, Functional Analysis, Linear Algebra, Discrete Mathematics, Number Theory, Numerical Analysis, and Machine Learning.
- Developed L^AT_EX-typeset course materials and Manim-animated visual lectures to strengthen conceptual understanding.
- Supervised undergraduate research projects and provided mentorship on independent mathematical inquiry.

International Competitions & Hackathons

AI Mathematical Olympiad (AIMO) — Progress Prize 3 | [Kaggle](#)

Nov 2025 – Apr 2026

- **Top 12% globally** — Our 2-members team ranked **495/4,138 teams**, scoring **42/50 (84%)** on original IMO-standard problems from a \$10M global prize fund competition.
- Engineered a weighted entropy pipeline on GPT-OSS-120B with Tool-Integrated Reasoning (TIR) and a parallel solving method of 8 simultaneous attempts per problem within a single inference pass.
- Optimised deployment on H100 GPUs (**Fields Model Initiative**); applied systematic hyperparameter tuning, mathematical guardrails, and few-shot prompting to guide model reasoning.

Harvard University CS50x Puzzle Day | [Certificate](#)

April 2026

- **Perfect score (10/10 puzzles)** including the Metapuzzle — Harvard's annual international logic and combinatorial reasoning competition with participants from **166+ countries**.
- Demonstrated formal reasoning, combinatorial problem-solving, and systematic logical deduction under timed conditions.

RAISE YOUR HACK | *Official Hackathon of RAISE Summit 2025, Paris* | [Certificate](#) | [GitHub](#)

July 2025

- Among **6,247 global participants** (\$150,000 prize pool); built **Acumen AI** — a multi-agent conversational platform powered by MCP Agents, Groq, LLaMA-3.3-70B, and FAISS semantic search.
- Designed real-time chat interface with persistent memory, session management, and natural language querying for business intelligence applications.

Trae AI IDE: Zero Limits Hackathon | [Certificate](#) | [GitHub](#)

June 2025

- Built an **AI-Powered Anti-Short-Video-Addiction Assistant** in a 48-hour global competition — XGBoost behavioral classification with real-time empathetic interventions.
- Architected a full-stack multi-agent pipeline: FastAPI AI inference layer (Python), Node.js frontend, Hugging Face and Novita AI model integration.

Selected Projects

Math Score Prediction: End-to-End ML Pipeline | [GitHub](#) | [Live App](#) | *Python, Scikit-learn, Streamlit, HuggingFace*

- Engineered a complete supervised learning pipeline on demographic and academic features; achieved **88%+ R² test accuracy** with 5-Fold cross-validation and **12% reduction in overfitting**.
- Benchmarked five regression models (Linear, Ridge, Lasso, Random Forest, Gradient Boosting) via bias-variance analysis; deployed as a live Streamlit application on HuggingFace Spaces.

Socioeconomic Determinants of Housing Valuation | [GitHub](#) | *Python, Linear Regression*

- Empirical regression study quantifying income, structural, and demographic influences on property prices ($R^2 = 0.92$); emphasis on statistical interpretability and mathematical rigor.

Employee Attrition & Workforce Analytics | [GitHub](#) | *Power BI, Statistical Analysis*

- Analyzed 1,470-employee dataset (16.2% attrition rate); identified highest-risk cohorts and developed interactive Power BI dashboards to inform HR strategy.

Music Store Customer Behavior Analysis | [GitHub](#) | *PostgreSQL, Business Intelligence*

- Designed 11 structured SQL queries across a relational database to extract revenue patterns, genre preferences, and regional customer segmentation for strategic decision support.

Technical Skills

Programming & Typesetting: Python, SQL, L^AT_EX, Manim

Scientific Computing: NumPy, SciPy, SymPy, Pandas, Matplotlib, Seaborn

Machine Learning: Scikit-learn, XGBoost, Hugging Face Transformers, FastAPI

LLMs & Agentic AI: Groq API, LLaMA (3.3-70B), MCP (Model Context Protocol), FAISS, Tool-Integrated Reasoning (TIR), Monte Carlo Tree Search (MCTS)

Data & Visualization: Excel, Tableau, Power BI, MySQL, PostgreSQL

Platforms: VS Code, Trae AI IDE, Jupyter Notebook, Google Colab, Streamlit, Git/GitHub

References

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