Muhammad Moosa

Prospective M.S. Candidate · Information Science / NLP / Artificial Intelligence

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RESEARCH INTERESTS

Aspect-Based Sentiment Analysis (ABSA) · Cross-Domain Transfer Learning · Modular NLP Pipelines & Prompt Engineering · Non-Autoregressive Decision Models · Retrieval-Augmented Generation (RAG) Architectures

EDUCATION

NED University of Engineering & Technology — *Karachi, Pakistan*

Bachelor of Science in Computational Finance (4-Year) — Expected: July 2027

Cumulative GPA: 3.552 / 4.00 (6 Semesters Completed)

Selected Rigorous Coursework

Mathematics & Statistics: Calculus I–II (A– / A) · Multivariate Calculus · Differential Equations (A–) · Numerical Methods · Probability & Statistics (A) · Statistical Inference (A) · Stochastic Models in Finance (A) · Stochastic Calculus · Mathematical Finance (A)

Computing & Algorithms: Programming (A+) · Data Structures & Algorithms (A–) · Computer Applications in Finance (A) · Operations Research (A–) · Financial Risk Management (A)

Government College for Men Nazimabad — *Karachi, Pakistan*

Higher Secondary Certificate (Pre-Engineering) · Grade: A — 2021 – 2023

Al-Murtaza School — *Karachi, Pakistan*

Secondary School Certificate (Science) · Grade: A+ — 2019 – 2021

PROFESSIONAL EXPERIENCE

JS Investments – Software Engineering Intern (IT Department) — *July – August 2025*

- Engineered automated Python pipelines for high-throughput ingestion and processing of social and market data streams, integrating scheduled batch orchestration to minimise manual extraction overhead.
- Designed RESTful API endpoints for unstructured web-data ingestion, applying schema normalisation and transformation routines to deliver structured datasets for financial research and analytics workflows.

TECHNICAL & ACADEMIC PROJECTS

Aspect-Enhanced Financial Sentiment & Cross-Modal Attention for Equity Forecasting *Proposal Approved 2026 – Expected 2027*

Undergraduate Thesis / Final Year Design Project, Dept. of Mathematics, NED University · Advisor: Dr. Ubaida Fatima · Python · PyTorch · Transformer NLP · Time-Series Modeling

- Approved thesis proposal for a two-branch multimodal architecture pairing aspect-based financial sentiment scoring (prompt-based extraction over pre-trained transformer backbones, e.g. FinBERT) with technical price and volatility time-series encoding, aimed at equity-market direction and volatility forecasting.
- Designing a cross-modal attention fusion mechanism to let textual and technical-indicator representations dynamically attend to one another, rather than relying on simple feature concatenation, to capture regime shifts where narrative and price signals diverge.
- Planned evaluation against PSX (KSE-100) and S&P 500 constituents, benchmarked against ARIMA-GARCH and unimodal FinBERT baselines using directional accuracy, RMSE, and backtested risk-adjusted return.

PSX Grid – AI-Integrated Financial Intelligence & RAG System — *2026 – Present*

Python · FastAPI · LangChain · Vector Databases · Embedding Pipelines

- Architected an end-to-end Retrieval-Augmented Generation (RAG) platform enabling structured semantic search over Pakistan Stock Exchange equity reports, grounding generative outputs on verified financial corpora to measurably mitigate hallucination.
- Engineered dense vector indexing, sentence-embedding pipelines, and re-ranking strategies for high-precision retrieval; deployed low-latency asynchronous FastAPI inference endpoints for production-grade throughput.

Other Projects *2024*

- **GoofCoin:** Prototype distributed ledger with Merkle-tree-inspired chaining and cryptographic transaction verification. *(Python · Django · React)*
- **TalkTopia:** Real-time messaging platform using Django Channels and WebSockets on AWS with persistent message queuing. *(Django · WebSockets · AWS)*

TECHNICAL SKILLS

Programming Languages: Python · JavaScript / TypeScript · SQL
ML / NLP Frameworks: LangChain · HuggingFace Transformers · scikit-learn · NumPy · Pandas
Web & Backend: FastAPI · Django · Django REST Framework · WebSockets · React
Databases & Stores: PostgreSQL · ChromaDB / FAISS (Vector) · Redis
Developer Tools: Git / GitHub · Docker · AWS (EC2, S3) · Linux / Bash · Jupyter · LaTeX

LEADERSHIP & SERVICE

- **ElderCare Health Volunteer – Educast Global & Stanford Medicine Programme:** Completed 40 service hours in elderly health assistance and community healthcare outreach.
- **HOPES Ambassador – NED University Chapter:** Coordinated on-campus medicine donation drives for underprivileged communities across Karachi.

The Quants Society – NED University of Engineering & Technology | *Student Professional Organisation*

- **Executive Committee Member – External Affairs (2026–Present):** Corporate outreach, academic liaison, and partnership development for departmental seminars and technical events.
- **Director of Technology & Innovation (2025–2026):** Led technical planning and digital infrastructure for analytical workshops and finance seminars.

HONOURS, CERTIFICATIONS & ACTIVITIES

Departmental Honours & Competitions

- Finalist (Top 5) – Computational Finance & Economics Equity Research Challenge (2026), organised by The Quants Society, NED University; selected among five university-wide finalists in a competitive equity valuation and market-analysis competition.
- Competition Participant – Badri ActuMinds 3.0 (Actuarial & Quantitative Modelling Competition); ProBattle 25 (Inter-University Programming & Algorithm Design Contest); NASA Space Apps Challenge, Karachi Chapter.

Certifications

- AI Engineer Certification – PIAIC (Presidential Initiative for Artificial Intelligence & Computing), Pakistan – January 2023
- CS50: Introduction to Computer Science, Web Programming with Python & JavaScript, and Introduction to Programming with Python – Harvard University (edX) – 2024

References and supplementary academic materials available upon request.