

# Abdullah Arshad

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## EDUCATION

### Lahore University of Management Sciences (LUMS)

Bachelor of Science in Computer Science (BS CS)

Lahore, Pakistan

Sep. 2021 – Jun. 2025

- **Relevant Coursework:** Artificial Intelligence, Computer Networks, Distributed Systems, LLM Systems, Machine Learning, Generative AI, Operating Systems, Software Engineering

## RESEARCH EXPERIENCE

### Multimodal Prediction of Anxiety/Depression Using LLMs

Sep. 2024 – Present

Advisors: Dr Basmaa Ali, Dr Agha Ali Raza

- Developed a framework leveraging LLMs to predict anxiety and depression using Urdu audio inputs.
- Focused on integrating multimodal data and designing predictive systems for underrepresented linguistic demographics.
- Built a pipeline for preprocessing audio data, extracting features, and training models.

### Mental Health Assessment Using Patient Records in Zanjabee Dataset

Sep. 2024 – Present

Advisors: Dr Basmaa Ali, Dr Agha Ali Raza

- Conducted research to predict anxiety and depression using anonymized patient data stored in PDF format.
- Designed and implemented methods to extract, preprocess, and analyze clinical data for model training.
- Applied OCR and natural language processing techniques to extract relevant text from scanned PDF files.

### Utilising LLMs for Streamlined Analysis of PTA Datasets

Jan 2024 – June 2024

Advisors: Dr Zafar Ayyub Qazi, Dr Ihsan Ayyub Qazi

- Designed a pipeline for analyzing PTA datasets using GPT-4, achieving a **96.8%** accuracy improvement through PDF splitting and JSON structuring.
- Applied advanced prompt engineering (Few-Shot and Chain-of-Thought) to extract insights for broadband benchmarking and KPI-based recommendations.
- Proposed frameworks for integrating LLM-based dashboards to enhance telecom policy decision-making.

### Detecting Political Polarization in News Channels Using LLMs

Sep 2024 – Dec 2024

Advisors: Dr Zafar Ayyub Qazi, Dr Ihsan Ayyub Qazi

- Developed a methodology using multimodal LLMs to analyze political polarization in video content, focusing on textual, visual, and auditory features.
- Implemented segmentation techniques to improve analysis of framing, emotional tone, and screen time allocation in news bulletins and talk shows.
- Achieved high inter-rater accuracy (0.98) across 9 videos, enhancing the reliability of bias detection.
- Explored Few-Shot prompting techniques to improve the granularity of insights and proposed future directions for scaling analysis to audience engagement and algorithm bias.

## WORK EXPERIENCE

### SensAI – AI Physician Assistant Platform

Sep. 2025 – Present

Lead Developer

Lahore, Pakistan

- Building SensAI, an AI-powered medical scribing platform that converts multilingual doctor-patient conversations into structured notes, problem lists, ICD-10 codes, and order sets, reducing documentation burden for physicians in Pakistan and the United States.
- Designed the system architecture and SRS for five core modules — Notetaking, Porus (clinical chatbot), Yoda (LLM query engine), Avatar (3D risk visualization), and Wenhsiu (assessment workspace) — in close collaboration with supervising physicians.
- Authored detailed workflows and UI states for Allergies, Medications, Social History, Habits, and OBGYN bins, including safety alerts, incomplete-data flags, and ethical rules such as *delete vs. discontinue* for medications.
- Specified functional and non-functional requirements for core infrastructure features like Pause, offline cache, secure offline mode, and model status indicators to ensure HIPAA/GDPR-aligned handling of clinical audio and PHI.
- Translated clinician feedback and edge cases (life-threatening allergies, duplicate meds, high-risk substance use, OBGYN-specific flows) into testable acceptance criteria and audit-friendly logging behavior.

## TEACHING EXPERIENCE

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### Teaching Assistant (CS-100: Introduction to Computing)

Fall 2023, Fall 2024

Lahore University of Management Sciences

- Conducted tutorials, held office hours, and graded assignments for over 200 students each semester.
- Guided students through fundamental programming concepts and problem-solving techniques in C++.

### Head of IT Department - SPADES

Feb. 2023 – Jan. 2024

Lahore University of Management Sciences

- Led the front-end development team and supervised the design and implementation of the main SPADES website.
- Assigned projects and monitored team progress to ensure timely and high-quality deliverables.
- Conducted workshops on front-end development, focusing on HTML, CSS, and JavaScript.

### Private Tutor

Jan. 2022 – Present

Self-Employed

- Taught programming languages (Java, Python, C++) to A-level and university-level students.
- Prepared students for academic success by providing tailored lessons and hands-on coding exercises.
- Mentored students on best practices in software development and problem-solving techniques.

## DEVELOPMENT PROJECTS

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### CS100 Virtual Teaching Assistant | C++, Generative AI, Google Gemini

- Developed a virtual teaching assistant tailored for CS-100 students at LUMS to provide coding guidance, evaluate solutions, and offer reinforcement exercises.
- Implemented features such as sanity and sufficiency checks, problem-solving guidance, and quizzes, focusing on C++ and aligning with the course curriculum.

### Content Moderation and Toxicity Classification | BERT, Transformers, Python, Jigsaw Toxic Comment Dataset

- Built a machine learning pipeline to classify toxic content (e.g., threats, insults, identity hate) using the Jigsaw Toxic Comment Dataset, leveraging models like Logistic Regression, RNNs, and Transformer-based architectures (BERT, DeBERTa).
- Designed preprocessing workflows and implemented Transformers for feature extraction and model training, achieving high accuracy in toxicity detection.

### Distributed Key-Value Store | Golang

- Implemented a distributed, fault-tolerant key-value store supporting leader elections and log replication with persistence.

### KIYA - Succession Planning System | MERN Stack

- Developed a web application for automated employee succession planning based on promotion criteria.

### Command-line Shell | C

- Created a shell in C capable of handling conjugated commands and pipelining.

## AWARDS

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- Recognized as a High Achiever for securing 13 A\*/A grades in O Levels.
- Awarded a 100% merit-based scholarship for the entire duration of A Levels.

## TECHNICAL SKILLS

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**Programming Languages:** Java, Python, C, C++, SQL (PostgreSQL), JavaScript, HTML/CSS, R

**Frameworks and Tools:** React, Node.js, Flask, FastAPI, WordPress, Material-UI, JUnit

**Developer Tools:** Git, Docker, TravisCI, Google Cloud Platform (GCP), VS Code, PyCharm, IntelliJ, Eclipse

**Libraries and Packages:** pandas, NumPy, Matplotlib, SciKit-Learn