# Ahmer Jamil

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## EDUCATION

**The University of Florida** – PhD in Computer Science *August 2025–Present*
Advisor: Professor Guanpeng Li
Area of Study: Dependable systems for High-Performance-Computing, Fault tolerance

**The University of Iowa** – PhD in Computer Science *August 2024–July 2025*
Advisor: Professor Guanpeng Li
Area of Study: Dependable systems for High-Performance-Computing, Fault tolerance

**Lahore University of Management Sciences** *August 2019–July 2023*
Graduated with Distinction
BSc in Computer Science (CGPA: 3.78)
Dean's Honor List

**Relevant Courses:** Topics in Computer and Network Security, Artificial Intelligence, Network-Centric Computing, Theory of Automata, Machine Learning, Speech Processing, Deep Learning, Software Engineering, Human Computer Interaction, Data Mining.

**Karachi Grammar School**
CAIE A-levels- 4A*s *August 2019*
CAIE O-levels- 7A*s, 3As *August 2017*

## RESEARCH EXPERIENCE

**Research Assistant – Dependable Systems Lab HPC, University of Iowa** *January 2025-August 2026*
Advisor – Dr Guanpeng Li (Assistant Professor at University of Iowa)

**Fault Tolerance** – worked at the intersection of compiler-level analysis and machine learning, developing LLVM-based tools to study fault tolerance, model silent data corruptions (SDCs), and apply applied ML techniques to mitigate reliability risks in modern computing systems

- Conducted compiler-level analysis by developing and extending LLVM passes to study program behavior under different execution conditions.
- Focus on fault tolerance mechanisms, examining how transient hardware faults impact instruction execution and program correctness.
- Analyze and model the occurrence of Silent Data Corruptions (SDCs) and their propagation through data-dependent sequences.
- Apply machine learning methods to predict, classify, and minimize the risks of SDCs, leveraging data from fault injection campaigns and execution traces.

**Research Assistant** *August 2023-August 2024*
Advisor(s) – Dr. Sazzadur Rehman (Assistant Professor at the University of Arizona), Dr. Ashish Gehani (Principal Computer Scientist at SRI) and Dr Fareed Zaffar (Assistant Professor at Lahore University of Management Sciences)

**DEBLOATBENCH** – The project provides a unified framework to evaluate a diverse set of container debloaters that can handle the diversity of design and execution environments for container debloating.

- Debloating Paradigm Evaluation:

    - Assessed container debloating paradigms through comprehensive metrics, emphasizing fairness in comparison.
    - Analyzed the impact on system calls, measured reduction in associated CVEs, and validated correctness of debloated images.
- Automation and Open-Source Initiative:
    - Developed and automated benchmarking processes under solid design principles for future research use.
    - Contributed to the open-source community by sharing an advanced benchmarking tool.
- Engaged in integrating the state-of-the-art tool "CIMPLIFIER" from the University of Wisconsin Madison into the proposed debloating framework.
- Emphasized the creation of visual representations for a more effective and intuitive comparison of debloating tools.

**Research Assistant - Internet Security and Privacy Lab (ISPL), LUMS** *August 2022-August 2023*
Advisor – Dr Fareed Zaffar (Assistant Professor at Lahore University of Management Sciences)

**Fraud Detection** – The project drew inspiration from existing works on credit card fraud detection and focused on using Machine learning techniques to reduce security risks in financial transactions by leveraging large datasets provided by Clariba SEIDOR, a consultancy firm

- Focused on refining credit card transaction security through techniques such as ensemble learning, data preprocessing, and the application of SMOTE to address class imbalance challenges.
- Executed comprehensive literature reviews, conducted exploratory data analysis, and applied and compared classification and clustering techniques for fraud detection.
- Integrated Snowflake and Dataiku tools to harness scalable computational power for machine learning model development and assessment.
- Addressed practical challenges in credit card fraud detection, including class imbalance and memory constraints, showcasing adaptability and solution-oriented thinking.

## WORK EXPERIENCE

**The University of Iowa** *August 2024-December 2024*
*Teaching Assistant – Artificial Intelligence*

- Aiding a class of 30+ students through regular office hours, addressing assignments and course related queries to enhance comprehension and academic success.
- Providing personalized guidance, encouragement, and motivation to foster confidence,
- independent problem-solving skills, and sustained academic growth.

**Systems Limited** *June 2023-July 2024*
*Associate Consultant – AI*

- LLM Solutions for Global Organizations
    - Collaborated with Microsoft to design and deploy LLM (Large Language Model) solutions for global organizations, leveraging Microsoft's cloud ecosystem.
    - Implemented advanced solutions using Azure Cognitive Services, Omni Channel platforms, LLMs, and RAG architecture.
    - Optimized models through fine-tuning to deliver cutting-edge, high-performance client applications.
    - Applied efficient fine-tuning techniques such as PEFT and LoRA to reduce computational costs.
    - Incorporated state-of-the-art research developments to ensure solutions remained innovative and competitive.
- Customer Segmentation
    - Engineered supervised learning pipelines using behavioral and demographic attributes to generate actionable customer clusters.
    - Enhanced robustness and interpretability by integrating probability calibration and ensemble

tree methods.
    - Leveraged SHAP and feature importance techniques to align insights with marketing strategy and targeted campaigns.
- Customer Churn Prediction
    - Developed churn prediction models using time-aware features such as Recency-Frequency-Monetary (RFM) variables, customer tenure, and ticket history.
    - Built end-to-end pipelines encompassing data cleaning, modeling, and uplift analysis to support retention strategies.
    - Monitored model drift and cohort shifts in production environments to ensure long-term model reliability and accuracy.
- LLM Training Sessions for Professionals
    - Conducted training sessions on LLMs and their architecture, covering Transformer architecture, RAG, fine-tuning, and NLP basics.
    - Designed and delivered quizzes, labs, and a final project for peers at Systems Limited, fostering comprehensive learning experiences.
    - Instructed professionals with a practical, industry-focused curriculum to enhance applied skills in modern NLP.
- Delivered Machine Learning Solutions for International Clients
    - Delivered scalable ML solutions for international clients such as Etisalat, including classification and predictive modeling.
    - Utilized tools such as PySpark, DataRobot, and Databricks to develop scalable and efficient machine learning models tailored to client needs.

**Lahore University of Management Science** *August 2021-June 2023*

*Peer Advisor*

- Advised and guided students in selecting appropriate courses and majors, ensuring alignment with academic goals and career interests.
- Mentored and supported a cohort of 30 students by fostering academic growth, providing personalized direction, and motivating them to achieve long-term success.

**VentureDive** *July–October 2022*

*Data Analysis Intern*

- GeoSpatial Data Processing
    - Automated web scraping with Selenium to collect comprehensive National and Provincial Constituency data in Pakistan.
    - Standardized and formatted acquired datasets to prepare them for advanced analysis and visualization.
- Interactive Webpage Development
    - Engineered an interactive webpage using Python, Flask, and HTML to display constituency-level information.
    - Integrated GeoJSON outputs into the platform, enabling seamless exploration of geospatial data.
- Visualization and User Experience
    - Enhanced graphical representation of data using online plotting tools for improved accessibility.
    - Implemented user-friendly features such as zoom, pan, and constituency-level detail retrieval to maximize usability.

**Habib Bank Limited** *June-July 2022*

*Branch Banking Intern*

- Developed ML models to measure employee effectiveness within branch banking operations.
- Analyzed employee performance metrics, customer interactions, and transactional data to identify patterns and provide insights for targeted training and performance improvement.
- Coordinated and executed an internal award campaign to recognize top-performing employees

**Lahore University of Management Science** *August 2021-December 2022*
*Teaching Assistant – Computational Problem Solving*

- Provided assistance to a class of 100+ students through regular office hours, addressing assignments and course-related queries to enhance comprehension and academic success.
- Conducted invigilation and grading for final exams and projects, ensuring fair evaluation and adherence to academic standards.
- Led tutorials for 100+ students, offering valuable insights and guidance to aid in the successful completion of assignments and projects.
- Created exams, weekly quizzes, and assignment tutorials for students, contributing to the design and implementation of effective and comprehensive assessment strategies.

**JS BANK** *June-August 2021*
*Data Science Intern*

- Executed daily SQL queries to optimize the ETL process for efficient data extraction, transformation, and loading.
- Leveraged existing customer data through SQL queries, contributing to the development of predictive analysis models.
- Translated predictive insights into actionable strategies, enhancing informed decision-making across diverse organizational departments.

## PROJECTS

**Language Classification Project**

- Developed a multilingual text classifier using supervised ML techniques including logistic regression, SVMs, and neural networks.
- Implemented models in Python with PyTorch and performed hyperparameter tuning to improve performance.
- Optimized accuracy to ~92% on test data, enabling practical application for multilingual text recognition.

**YAPL Interpreter Project**

- Engineered an interpreter for a custom programming language (YAPL) using Python Lex-Yacc (PLY).
- Applied theoretical foundations of automata, FSMs, CFGs, and regex to design parsing and execution components.
- Validated accuracy by successfully compiling and executing 50+ user-defined test programs, demonstrating reliability of the interpreter.

**Knowledge Distillation Research**

- Investigated compression methods for deep neural networks using teacher-student architectures.
- Trained convolutional networks on the CIFAR-10 dataset, comparing direct vs. hierarchical distillation.
- Demonstrated that direct teacher-student pipelines reduced test accuracy loss by ~5–7% over intermediary approaches.
- Utilized PyTorch, NumPy, and scikit-learn for experimentation and analysis.

**LUMS Mobile App**

- Collaborated on a cross-platform university portal app using React Native for the front-end and Python/JavaScript APIs for the back-end.
- Integrated multiple features (course registration, grades, notices, and library) into a single mobile interface.
- Improved user navigation efficiency by ~30% based on feedback from student usability tests.

**Afloat: Mental Health UX Design**

- Conducted surveys and interviews with 40+ students to identify gaps in mental health accessibility.
- Designed a mobile UX prototype in Figma emphasizing empathy, accessibility, and usability.
- Enhanced task completion in prototype testing by ~25%, reflecting clearer workflows and better user support.
- People Identification System
- Built a celebrity identification pipeline in Python using OpenCV for image preprocessing and Haar cascades for face detection.
- Extracted features with wavelet transforms and applied GridSearchCV for model selection.
- Achieved ~88% accuracy on validation data and deployed via Flask with an HTML/CSS interface for user-friendly classification.

**LLM-Powered Chatbot**

- Developed a knowledge-based chatbot leveraging Retrieval-Augmented Generation (RAG) and ChromaDB vector database.
- Integrated OpenAI GPT-3.5 to enhance conversational fluency and contextual understanding.
- Implemented a clean HTML/CSS interface with backend support in Python for seamless interaction.
- Delivered ~85% accuracy on domain-specific queries, supporting knowledge retrieval use cases.

**C++ Snake Game**

- Programmed an interactive Snake game in C++ applying object-oriented programming principles.
- Implemented real-time collision detection, score tracking, and adaptive difficulty progression.
- Optimized memory management for smooth performance on low-resource systems.

**Customer Segmentation**

- Engineered supervised learning pipelines in Python using scikit-learn and XGBoost to generate
- customer clusters.
- Incorporated behavioral and demographic features, applying probability calibration and ensemble trees.
- Leveraged SHAP values to explain model outputs, aligning insights with marketing strategies.
- Increased simulated campaign response rates by ~12% through targeted customer segmentation.

**Churn Prediction**

- Developed predictive models using RFM features, tenure, and support ticket history with logistic regression and gradient boosting.
- Built end-to-end pipelines including feature engineering, model training, and uplift analysis in PySpark and Python.
- Monitored model drift in production-like settings, ensuring long-term reliability.
- Identified at-risk customers with ~80% precision, providing actionable insights for retention strategies.

**Fake News Detection (Data Mining)**

- Implemented a misinformation detection pipeline using Python, scikit-learn, and NLP libraries (NLTK, spaCy).
- Applied frequent pattern mining techniques (Apriori, FP-Growth) to extract key linguistic and semantic patterns.
- Combined machine learning classifiers (Random Forest, SVM) with feature engineering for enhanced accuracy.
- Achieved ~87% classification accuracy on benchmark datasets, supporting practical applications in misinformation filtering.

## SKILLS

**Languages:** Fluent in English, Urdu, and Sindhi.
**Technical Skills:** Proficient in MS Office (Word, PowerPoint, Excel) & Canva
**Programming Languages:** Experienced in C++, Python (3+ years), SQL, R, Haskell, and JavaScript.
**Others:** Figma, Power BI, React, React-Native, HTML, Flask, LLM, Azure, RAG architecture.

## CERTIFICATIONS

**Cloud & Databases**
Microsoft Azure SQL (Coursera), Explore Core Data Concepts in Microsoft Azure (Coursera), Intermediate SQL Server (DataCamp), Introduction to SQL Server (DataCamp), Joining Data in SQL (DataCamp)

**AI & Machine Learning**
Generative AI Fundamentals (Databricks), Large Language Models: Application through Production (Databricks), Unsupervised Learning in Python (DataCamp), Machine Learning with scikit-learn (DataCamp), Introduction to Python (DataCamp)

**Data Analysis & Visualization**
Data Analysis in Excel (DataCamp), Intermediate Data Modeling in Power BI (DataCamp), Data Modeling in Power BI (DataCamp), Introduction to Power BI (DataCamp), Data Analysis in Spreadsheets (DataCamp), Introduction to Spreadsheets (DataCamp)

## EXTRA-CURRICULUR ACTIVITIES

**Director HR at LUMS Students Mathematics Society** *August 2021-May 2022*
- Collaborated with other departments to support the overall mission and goals of the society
- Managed registration process for major society events

**Team Member HR at LUMS Photography Society** *August 2020-August 2022*
- Maintained accurate records of member attendance and performance.
- Managed registration process for ELAP