

# Ayesha Fazal Lashkarwala

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## EXPERIENCE

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### Technische Universität Berlin

Jul. 2025 – Present

#### *Working Student - Data Integration and Data Preparation*

Berlin, Germany

- Curated and prepared a domain-specific dataset from Hugging Face for efficient experimentation
- Developed a visual logging tool to streamline monitoring and analysis of Large Language Model outputs
- Researched and evaluated inference servers to identify the most suitable solution for deployment
- Engineered a high-performance ML microservice using FastAPI
- Integrated Polars to optimize data ingestion and convert raw data uploads into Hugging Face Datasets
- Implemented a middleware layer to ensure seamless frontend-backend integration

### Brandenburgische Technische Universität Cottbus - Senftenberg

Oct. 2025 – Present

#### *Student Assistant - Explainable Machine Learning (XAI)*

Cottbus, Germany

- Developed and delivered a Python programming curriculum to 100+ enrolled students
- Taught core ML concepts, focusing on data hygiene and the implementation and interpretation of linear and logistic regression models
- Demonstrated the impact of Feature Engineering (Standardization, Normalization) on model performance through hands-on programming tutorials

### Spur Solutions Pvt Ltd

Jul. 2023 – Sep. 2024

#### *Associate Software Engineer*

Karachi, Pakistan

- Performed in-depth data analysis to standardize and harmonize system metrics, enhancing data consistency and reliability across the software platform
- Reduced execution time by 89% by optimizing a complex stored procedure within the legacy system which supported real-time decision-making based on user-defined rules
- Enhanced the capabilities of an established legacy system programmed on .NET Framework by integrating functionalities for two distinct roles
- Integrated SignalR into a legacy .NET Framework system, optimizing real-time communication for enhanced user experience

### Lahore University of Management Sciences (LUMS)

Jan. 2023 – May 2023

#### *Teaching Assistant - Principles and Techniques of Data Science*

Lahore, Pakistan

- Encouraged students to learn by organizing tutorials in Python and conducting office hours weekly
- Aided the instructor by regularly preparing assignments and checking quizzes and assignments as well as leading a semester-long project for 80+ students

### Bazaar Technologies Pvt Ltd

May 2022 – Jul. 2022

#### *Product Analytics Intern*

Karachi, Pakistan

- Analyzed data using Mixpanel and SQL queries to find useful insights
- Identified discrepancies in the available data and reported them to higher authorities

## PROJECTS

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### AdaptiRead

- Developed an interpretable Artificial Intelligence system to simplify text for dyslexic readers
- Engineered a custom complexity metric combining lexical rarity (Zipf frequency) and phonological features (syllable count) to quantify reading difficulty

- Fine-tuned a T5-small Seq2Seq Transformer on the WikiAuto dataset to generate simplified text
- Implemented a semantic preservation loop using BERTScore (F1-score > 0.85) to prevent meaning drift
- Integrated Explainable AI (XAI) using LIME to interpret model outputs

**Driver Facial Expression Recognition using Mobile Vision Transformer**

- Evaluated Global Context Vision Transformer (GC-ViT) against MobileViT to optimize for real-time driver monitoring systems
- Achieved an 80% reduction in parameters (from 28M to 5.6M)
- Reduced total inference time by 3 hours across the dataset
- Validated MobileViT-S on the KMU-FED dataset, maintaining a strong 0.9042 F1-score despite significantly lower computational overhead

**Thesis - Adaptive Learning Application for Maths**

- Conducted research and created a machine learning-based system to classify and analyze common mathematical mistakes made by 220 young learners in low-resourced schools in Pakistan, identifying eight distinct mistake categories
- Designed and implemented a machine learning pipeline using classical (Naive Bayes, Logistic Regression) and deep learning techniques, achieving up to 87% accuracy with classical models
- Used Google Vision API for image-to-text conversion and feature extraction, creating detailed CSV files for model training and testing
- Performed data augmentation and image processing (cropping, grayscale adjustments) to expand the dataset, improving deep learning model accuracy from 37% to 60%
- Designed and prototyped a user-friendly web application interface (MathMate) using Figma, incorporating HCI principles, local context, and insights from extensive research on existing EdTech platforms
- Followed a "evaluation-driven adaptive learning" approach to provide personalized feedback to students, enhancing their understanding of mathematics in low-resourced environments

**Authorship Attribution Model**

- Scraped tweets of 600+ Twitter/X users
- Performed data cleaning using regular expressions (regex), extracted features forming the vocabulary
- Used Laplace Smoothing to handle out-of-vocabulary words
- Built multiple machine learning models (KNN, Gradient Boosting Trees and Multilayer Perceptron (MLP)) to see which model performed the best

**Mask Detection System**

- Utilized Darknet and YOLOv3 to make a mask detection system
- Developed the model to be compatible with both live as well as recorded videos

**EDUCATION**

<b>Brandenburgische Technische Universität Cottbus - Senftenberg</b> <i>Master of Science in Artificial Intelligence</i>	Oct. 2024 – Sep. 2026 Cottbus, Germany
<b>Lahore University of Management Sciences (LUMS)</b> <i>Bachelor of Science in Computer Science</i>	Sep. 2019 – Jun. 2023 Lahore, Pakistan

**SKILLS**

**Programming** : Python, C# , C++, JavaScript, SQL, R  
**AI and ML** : PyTorch, TensorFlow, Keras, Scikit-learn, Hugging Face, XAI (LIME)  
**Backend and Data** : FastAPI, Polars, Pandas, ETL Pipelines, REST APIs  
**Tools** : Git/GitHub, Figma, Mixpanel, TFVS  
**Soft Skills** : Problem Solving, Pattern Recognition, Communication, Teaching, Leadership, Collaboration, Time Management, Analysis, Research  
**Language Skills** : *English* C2 - Fluent, *German* A2 - Conversational, *Urdu* C2 - Native