Adeeba Rafi

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EDUCATION

Hazara University Mansehra, Pakistan
Bachelor of Science in Computer Science | GPA: **3.44 / 4.0** *2020-2024*

Relevant Coursework: *Data Structures & Algorithms, Artificial Intelligence, Natural Language Processing, Database Systems, Operating Systems, Object-Oriented Programming, Human-Computer Interaction, Information Security*

ACHIEVEMENTS

- **IELTS:** Overall, 6.5 band score
- **@LeetCode:** Solved 90+ Data Structures & Algorithms problems(Link)
- **Winner** of CS50x Puzzle Day 2025 organized by **Harvard University**, USA(Link)
- **@lablab.ai:** Participated in 5+ International Hackathons(Link)
- Selected from a global applicant pool for the prestigious **Aspire Leaders Program** by Harvard University (Link)
- **International DOGE Hackathon:** Created an AI tax assistant chatbot that helps people & the government(Link)
- Participated in **Advent of code 2024** & solved competitive questions consistently for 25 days(Link)
- Ranked 133rd out of 1700 teams internationally in the **MIT** Winter Coding Competition, USA 2025(Link)
- **AI for connectivity hackathon:** Built an AI tool to predict & optimize IT infrastructure maintenance, improving system reliability(Link)
- **AIstronauts Space Agents** on a Mission Hackathon: Collaborated in a team to develop *The Smart Space Habitat Manager*, an AI-powered system for real-time space habitat management(Link)
- Participated in the **2024 CALICO UC Berkeley Coding** Competition, USA (Link)
- **Generative AI Hackathon with IBM Granite Summary:** Developed BizNexus-AI, an AI-powered analytics platform that helps businesses overcome data fragmentation by providing predictive insights and automated decision-making across HR, e-commerce, and business intelligence (Link)
- **ZeroPhish Gate**: Multilingual security tool that detects and explains phishing, spam, and fraudulent content in emails, chats, and files, using both pattern-based analysis and advanced language understanding(Link)

TECHNICAL SKILLS

Programming Languages: Python, HTML/CSS/Bootstrap, C/C++, Flutter/Dart,
Machine Learning & Deep Learning: Pandas, numpy, matplotlib, PyTorch, TensorFlow, Keras, Scikit-Learn, Streamlit
Operating Systems: Windows, macOS
Developer Tools: Git, GitHub, Google Colab, Jupyter Notebook, PyCharm, Visual Studio
AI & Data Science Platforms: Hugging Face, Kaggle

ACADEMIC PROJECTS

Backdoor Attack on Neural Network using MNIST Dataset | (GitHub)

- Built and trained a deep neural network on MNIST data to study how small hidden triggers in training data can fool models.
- Added a simple backdoor pattern to explore model trust, security risks, and data poisoning effects.
- Showed that triggered inputs caused targeted misclassification while the model kept high normal accuracy (~95–97%).
- **Technologies** Used: Python, PyTorch, TorchVision, Matplotlib
- **Key Learnings**: data poisoning, model reliability, and importance of secure training data

EEG Motor Imagery Classification using Deep Learning | (GitHub) | Article

- Built a deep learning model to classify motor imagery EEG signals (left/right hand, feet, tongue) using the HCI competition dataset. The project focused on BCI applications i.e. movement prediction & assistive technology.

- Implemented hybrid models (CNN-LSTM, BiGRU-CNN) to extract spatial and temporal features from EEG signals.
- Achieved strong performance with **Accuracy: 97%**, showing high reliability in EEG signal classification.
- Wrote technical articles by reviewing research papers and summarizing project learnings, developing a regular habit of research reading and academic-style writing.
- **Technologies Used:** Python, TensorFlow/Keras, NumPy, Scikit-learn, Matplotlib, Seaborn
- **Key Learnings:** Time-series preprocessing, deep learning for brain signal decoding, model evaluation (confusion matrix, classification report), and practical exposure to medical informatics and BCI research.

The "Trickster" Defense | Guarding AI Models from Data-Free Theft | (GitHub)

- Developed a lightweight defense prototype against data-free model extraction by making model outputs data dependent.
- Implemented a victim CNN trained on CIFAR-10 and simulated attacker queries using Fashion-MNIST as out-of-distribution data.
- Demonstrated that adding targeted output uncertainty for OOD queries reduces clone model accuracy from 30% to 10%.
- **Technologies Used:** Python, PyTorch, Torchvision, Gradio, OpenCV, Google Colab.
- **Key Learnings:** model extraction threats, OOD detection, defensive noise injection, practical experiment design and evaluation.

Salon Booking Application With AI Chatbot | (GitHub)

- Developed a salon booking application that allows women to book appointments from home, browse available services, and view beauticians along with their charges.
- Integrated an AI-powered chatbot for automated customer support, enhancing user interaction & providing real-time assistance.
- **Technologies Used:** HTML, Bootstrap**,** Firebase**,** Flutter/Dart

Emotion Recognition from EEG Signals using Machine Learning | (GitHub)

- Built a machine learning model to classify emotions from EEG brain signals.
- Used a Random Forest Classifier to predict Positive Neutral or Negative emotions.
- Reached about **96.8% Accuracy** which shows strong prediction results.
- Created data cleaning steps visual charts and a feature importance plot to explain the results.
- Learned how brain waves relate to emotion and how AI works with EEG data.
- **Tools Used:** Python Google Colab Pandas Scikit learn Matplotlib

WORK EXPERIENCE

Application Developer | Change Mechanics Pvt. Ltd | (Link) ***2024***

- Built cross-platform applications using Flutter & Dart.
- Implemented Firebase Authentication & Firestore for data management.
- Developed Cloud Functions for backend automation.
- Designed responsive UI with dart, HTML, CSS, and Bootstrap.

Teacher| Primary Level | PSA School | *Summer & Winter Vacations* ***2022 – 2024***

- Assisted teachers in conducting lessons and activities for primary school students.
- Helped with classroom management, student guidance, and homework support.
- Gained hands-on experience in teaching, patience, and communication with young learners.

Fiverr | ***Freelance Graphic Designer*** | (Link) ***2022 – 2025***

- Designed social media posts, posters, and ads using Canva and Illustrator.
- Created logos, flyers, and templates for client branding.
- Delivered custom event and campaign designs on time.

LEADERSHIP & VOLUNTEER EXPERIENCE

Teaching Experience | *Python Programming &* IELTS *Instructor* ***ICodeGuru, USA (Remote)***

- Led Python programming sessions for 100+ underprivileged students, covering core topics like variables, data types, input/output, loops, and functions

- Conducted classes via Zoom, created quizzes and assignments, and supported students in building a strong programming foundation

Volunteer Experience | *Graphic Designer* ***Hazara University, KPK***

- Designed posters & social media content to promote student project exhibitions at university
- Organized workshops promoting STEM education and gender equality, encouraging young learners, especially girls, to explore technology and pursue computer science.
- Assisted faculty in organizing weekly on-campus events by providing visual materials and event organization and coordination support

Leadership Experience | *Hackathon Team Leader* ***Lablab.ai, California***

- Led two hackathon teams as a team leader, where I learned to manage time under pressure, communicate clearly, and coordinate tasks effectively to keep the team focused and deliver results on time

Environmental Cleanup & Blood Donation ***Hazara University, KPK***

- Participated in environmental cleanup drives to promote a pollution-free campus and community
- Donated blood and assisted in organizing awareness sessions for thalassemia at my university.

INTERNATIONAL CODING COMPETITIONS & HACKATHONS

AI Tax Assistant Chatbot | DOGE Hackathon | Demo | (GitHub)

- Worked on the chatbot's front-end UI, designing and developing the interface for a seamless user experience.
- Worked on project documentation and presentation, explaining the chatbot's functionality, architecture, and real-world impact.
- Tech Stack: HTML, CSS, Bootstrap, Python, Flask, PostgreSQL, BERT, Hugging Face

ZeroPhish Gate | Gen AI Hackathons | Demo | (GitHub)

- Built a multilingual security assistant to detect and explain phishing, spam, and fraud in emails, chats, and files.
- Developed hybrid AI detection using BERT for pattern matching and LLaMA for semantic analysis, with role-based actionable advice, added accessibility features including support for 40+ languages, text-to-speech, and downloadable security reports.
- Tech Stack: Python, Flask, Transformers (BERT), Groq API (LLaMA), gTTS (Text-to-Speech), PyPDF2, Flask-CORS

Maintenance Predictive System for Data Centers | AI for connectivity hackathon **| (**Demo**)**

- Worked on developing an interactive UI using Gradio, allowing users to interact with the predictive system.
- Built the predictive AI model, analyzing CPU load, storage usage, and temperature to forecast maintenance needs.
- **Tech Stack:** Python, Pandas, NumPy, Scikit-Learn, Gradio, Hugging Face

Coding Competitions

- I **won Harvard University's** CS50 Puzzle Day by solving all 9/9 problems (Link)
- Qualified for the **UC Berkeley Coding Competition**, competing against top programmers and refining my algorithmic thinking (Link)
- Ranked 133rd out of 1700 teams globally in the **MIT Winter Coding Competition** 2025, a testament to my perseverance and ability to tackle complex problems under pressure(Link)
- Actively participated in **Advent of Code**, solving daily challenges that pushed my problem-solving skills and logical reasoning(Link)