

ZIA UR REHMAN

PhD Researcher in Computer Science

Federated Learning • Generative Models • Explainable AI • Evolutionary Algorithms • Green AI • Ensemble Learning • Parallel Computing

PhD researcher at University of Limerick ([Lero](#), BDS Group) supervised by Prof. Conor Ryan, developing privacy-preserving, and interpretable machine learning frameworks that integrate ensemble methods using Grammatical Evolution in federated architectures, aligned with responsible AI and computational efficiency in distributed environments.

+353 899490619
engrziaurrehman.kicsit@gmail.com

LinkedIn
GitHub
lero.ie/people/zia-ur-rehman
Google Scholar
ResearchGate
PyPI

PUBLICATIONS

2025Hassan, U., Rehman, Z., Ahmad, I. et al. Analyzing the energy consumption of random forest and support vector machine models: paving the way for green and sustainable artificial intelligence. *Discover Internet Things*, 5, 100.➔

2025Rehman, Z.U., Hassan, U., Islam, S.U., Gallos, P., Boudjadar, J. Energy-Efficient AI for Medical Diagnostics: Performance and Sustainability Analysis of ResNet and MobileNet. *Studies in Health Technology and Informatics*, 327, 1225–1229.➔

2024Rehman, Z.U., Shah, S.N.M., Hassan, U., Islam, S.U. Enhancing Brain Tumor Classification Using CNN: Impact of Data Augmentation on Model Generalization and Performance in Federated Learning. *2024 26th International Multi-Topic Conference (INMIC)*, 1–6. IEEE.➔

2024Rehman, Z.U., ul Islam, S., Hassan, U., Boudjadar, J., Buyya, R. Improving CNN model training time efficiency using MPI-driven parallelization and ensemble learning. *International Conference on AI and the Digital Economy (CADE 2024)*, 128–133. IET.➔

2024Hassan, U., ul Islam, S., Shah, S.N.M., Rehman, Z.U., Boudjadar, J. Towards green and sustainable artificial intelligence: quantifying the energy footprint of logistic regression and decision tree algorithms. *International Conference on AI and the Digital Economy (CADE 2024)*, 64–68. IET.➔

EXPERIENCE

Academia

Sep 2025

Teaching Assistant

University of Limerick, Limerick, Ireland

Sep 2025 – Present

Assisting in undergraduate and graduate computer science courses at UL.

Academia + Industry

Jan 2023

Computer Vision Consultant

Vision Insighta, Rawalpindi, Pakistan

Jan 2023 – Dec 2023
(One Year)

- Developed OpenCV and Raspberry Pi-based interactive display systems.
- Designed gesture-based presentation control and virtual whiteboard solutions.

Academia

July 2019

Lab Engineer

Institute of Space Technology (IST), Islamabad, Pakistan

July 2019 – June 2025
(Six Years)

- Conducted labs for Computer Vision, Information Security, Digital Image Processing, Microcontroller Application & Design, System Programming, Computer Vision, Machine Learning, Digital System Design, Circuit Analysis, Digital Logic Design, Microprocessor System Design, Embedded Systems Design.
- Supervised AI/Computer Vision projects.
- Implemented MPI-based parallelization for ML optimization.

Industry

Aug 2018

Embedded System Design Engineer

Barqi Labs, Rawalpindi, Pakistan

Aug 2018 – Dec 2018
(Five Months)

- Automated a scoreboard using PIC microcontrollers and IR sensors.
- Designed DTMF-controlled robotic-car, Bluetooth locks, and data loggers.

Industry

July 2016

Engineering Intern

KSOFT, Islamabad, Pakistan

July 2016 – Aug 2016
(Two Months)

Worked on hardware interfacing for pathology lab and medical diagnostic equipment.

EDUCATION

PhD in Computer Science

University of Limerick, Limerick, Ireland

Focus Areas: Federated Learning, Explainable AI, Evolutionary Algorithms, Generative Models, Ensemble Learning, Privacy-Preserving ML.

June 2025 – Present

Masters in Computer Science (MScS)

Institute of Space Technology (IST), Islamabad, Pakistan

Honors: Summa Cum Laude | Rank 1 | CGPA: 4.0/4.0

Thesis: “Towards Enhanced Federated Learning Efficiency through Parallel Computing and Data Augmentation Techniques.” This research enhances federated learning efficiency by comparing baseline FL, MPI-parallelized FL, and MPI with data augmentation, evaluating accuracy, speed, and resource utilization trade-offs.

Aug 2022 – Sep 2024

Bachelor of Science in Computer Engineering (BSCE)

University of Engineering and Technology (UET), Taxila, Pakistan

Gold Medalist | Rank 1 | CGPA: 3.77/4.0

FYP: “Mind Control Wheelchair”

2014 – 2018

Doctoral Studies

June 2025

Graduate

Aug 2022

Undergraduate

July 2014

R&D CONTRIBUTIONS

Research & Development Projects

Developed EnergyEfficientAI Python Library

A Python library for real-time CPU, memory, and power monitoring during model training. Used for analyzing energy footprints of ML workloads.

View on PyPi

AI Workshop

Repository contains materials and example codes for a comprehensive workshop covering various aspects of Artificial Intelligence (AI) using Python.

View on GitHub

Implementation of ML Algorithms

Repository contains materials and example codes for implementing parallel programming using Python.

View on GitHub

MPI (Message Passing Interface) | Parallel Progamming

Repository contains materials and example codes for implementing machine learning algorithms using Python.

View on GitHub

OpenCV Course

OpenCV Basic Course for Beginners

View on thinkific.com

Comparison of Programming Languages w.r.t. Energy Consumption

View on GitHub

Raspberry Pi 5 Power Monitoring Tool

A lightweight, real-time system monitoring dashboard built with Python and ttkbootstrap for Raspberry Pi devices. Displays CPU/RAM usage, temperatures, clock frequency, and power status in a beautifully styled GUI.

View on GitHub

Learn Evolutionary Algorithms

View on GitHub

TECHNICAL SKILLS

Programming Languages Python, C/C++, Embedded C, MATLAB, Verilog HDL, LaTeX	Frameworks & Libraries TensorFlow, PyTorch, Scikit-learn, OpenCV, Keras, Mediapipe, YOLOv5, MPI4Py, Deap	Development Tools VS Code, PyCharm, GitHub, Anaconda, Docker, Jupyter, Google Colab, Kaggle, Overleaf
Hardware Raspberry Pi, Arduino, PIC, FPGA (Artix-7), PCB Design, Proteus, Vivado, MPLAB	Operating Systems Linux (Ubuntu), Raspbian, Windows	Research Specializations Federated Learning, Explainable AI, Green AI, Evolutionary Algorithms, Generative Models, Ensemble Learning, Privacy-Preserving ML, Parallel Computing, Energy-Efficient AI, Computer Vision

WORKSHOPS & INVITED TALKS



A Hands-On Workshop on Computer Vision using OpenCV Python
Speaker, Institute of Space Technology, Islamabad — December 8, 2023



A Hands-On Workshop on Artificial Intelligence and Implementation Strategies
Speaker, Institute of Space Technology, Islamabad — December 6–7, 2023

CERTIFICATIONS



Image Classification with CNNs using Keras
Coursera
Skills: Deep Learning · CNNs · Digital Image Processing
Issued Apr 2024



Introduction to Generative AI
Google Cloud Skills Boost
Credential ID: 4272251
Issued Jul 2023



Transformer Models and BERT Model
Google Cloud Skills Boost
Credential ID: 4272452
Issued Jul 2023



Python for Machine Learning
Great Learning
Issued Feb 2022



Learn Linux from Scratch
EDUONIX
Issued Sep 2021



Introduction to Computer Vision and Image Processing
IBM
Issued Oct 2023



Introduction to Image Generation
Google Cloud Skills Boost
Credential ID: 4272354
Issued Jul 2023



Face Detection with OpenCV in Python
Great Learning
Issued Feb 2022



Git Crash Course — Build Node JS Project
Udemy
Issued Nov 2021



Image Processing Onramp / MATLAB Onramp
MathWorks
Issued Feb 2021 / Jan 2020

HONORS & ACHIEVEMENTS

- **Summa Cum Laude** in Master of Science (Computer Science) - Institute of Space Technology
- **Gold Medal** in Bachelor of Science (Computer Engineering) - UET Taxila
- Top of class in both MS and BS programs (Rank 1)
- First Division throughout entire academic career

REFERENCES

Dr. Saif Ul Islam
Research Fellow (Cyber Systems Engineering)
WMG, The University of Warwick, Coventry, UK
✉ Saif.Islam@warwick.ac.uk  LinkedIn

Prof. Conor Ryan
Professor
University of Limerick, Limerick, Ireland
✉ Conor.Ryan@ul.ie  Faculty Profile

References available upon request