

# Shujah Ur Rehman

+92 321 4162930 — shujahreman1@gmail.com

## EDUCATION

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**Lahore University of Management Sciences (LUMS), Pakistan**  
*M.S Electrical Engineering (Graduated with Distinction)*

Aug. 2021 – Jan. 2024

**Lahore University of Management Sciences (LUMS), Pakistan**  
*B.S Electrical Engineering*

Aug. 2015 – July 2019

## EXPERIENCE

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**Research Specialist – RISC Lab, KAUST, Saudi Arabia**

Sep. 2025 - Present

- *Perception for Agriculture and Underwater Robotic Applications* :
  - Built an **end-to-end CV pipeline** for autonomous date-palm harvesting, deployed on Jetson AGX Orin.
  - Curated and annotated 7,000+ real-world images using CLIP-based filtering and instance segmentation.
  - Trained and optimized **YOLOv8-Seg** for challenging outdoor agricultural conditions.
  - Achieved **30 FPS embedded inference** via model scaling and INT8/FP16 quantization.
  - Integrated perception with **ROS2 robotics pipelines** and contributed to technical documentation.

**Research Associate – Algorithms in Theory and Practice Lab, LUMS**

Sep. 2022 – Aug. 2025

- *Semi-Supervised Learning for Medical Imaging data* :
  - Implemented a complete pipe-line from pre-processing to training deep learning models for semi-supervised medical image segmentation for both 2D and 3D Cardiac MRI datasets in PyTorch.
  - Proposed a computationally efficient U-Net based approach with two decoders for 3D Cardiac MRI scans leading to state-of-the-art performance.
  - Explored self-supervised and fine-tuning approaches to enhance the generalizability of deep learning models for multi-center medical datasets.

**Research Assistant – Computer Vision & Graphics Lab, LUMS**

July. 2022 - Oct. 2022

- *Crop Classification for LBDC Region* :
  - Collaborated with a team, including a PhD student, to assess and improve the classification accuracy of a Random Forest Classifier for Rabi and Kharif seasons in the LBDC region, Punjab, Pakistan, using Google Earth Engine.
  - Developed visualizations for key indices (NDVI, EVI, NDWI) to track seasonal variations and enhance model performance.
  - Conducted qualitative and quantitative analysis on the impact of NDVI thresholds, masking, and monthly intervals on classification accuracy.
  - Compiled findings into detailed reports and presented progress during weekly review meetings.

**Research Officer – HPCNL, UET Lahore**

Mar. 2021 - Aug. 2021

- *Cross-lingual Transfer Learning for Urdu text* :
  - Built and analyzed datasets, including Urdu-English word dictionaries and bilingual corpora for NLP tasks like propaganda detection, topic classification, and sentiment analysis.
  - Implemented end-to-end pipelines for Urdu text processing and transfer learning in Python, covering dataset pre-processing to model deployment.
  - Performed a benchmarking of popular transfer learning methods for text classification tasks for Urdu text classification tasks.
- *Pre-training BERT for Urdu Corpus* : Implemented a complete pipeline from pre-processing of the Urdu text data to implementation of the Transformers based BERT model for Urdu text.

**Research Assistant – Advanced Communications Lab, LUMS**

Oct 2019 - Aug 2020

- *Indoor Localization using Wi-Fi Received Signal Strength* - Implemented outlier removal using K-Means clustering and confidence intervals to reduce the localization error.

## TEACHING EXPERIENCE

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|---|---------------------|
| <b>CS 437 Deep Learning</b>   | Sep 2023 – Dec 2023 |
| <ul style="list-style-type: none"><li>• Held weekly office hours, invigilated quizzes and exams, held tutorials, graded assignments</li></ul>               |                     |
| <b>CS 653 Digital Image Processing</b>  | Jan 2023 – May 2023 |
| <ul style="list-style-type: none"><li>• Held weekly office hours, invigilated quizzes, graded assignments and quizzes.</li></ul>                            |                     |
| <b>CS 437 Deep Learning</b>   | Sep 2022 – Dec 2022 |
| <ul style="list-style-type: none"><li>• Developed the assignments and recorded the tutorials</li></ul>  |                     |
| <b>CS 455 Principles of Digital Audio &amp; Video</b>   | Jan 2020 – May 2020 |
| <ul style="list-style-type: none"><li>• Held weekly office hours, invigilated quizzes, held assignment tutorials, graded assignments and quizzes.</li></ul> |                     |

## PUBLICATIONS

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| <b>Investigating Cross-lingual Transfer Learning for Urdu Text Using Word</b><br><i>International Conference on Open-Source Systems and Technologies (ICOSST) 2021</i> | Published Dec, 2021 |
| <b>Semi-Supervised Segmentation of Left Atrium on 3D Cardiac MRI Scans using Ambiguity-weighted Uncertainty Learning</b><br><i>Multimedia Tools and Applications</i>   | In Submission       |
| <b>Do state-of-the-art semi-supervised segmentation methods yield robust clinical measures?</b><br><i>Journal of the American College of Cardiology</i>                | In Writing          |

## PROGRAMMING SKILLS

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- **Languages:** Python, MATLAB, C++
- **Machine Learning Skills:** PyTorch, Sci-kit learn, OpenCV, Numpy, Pandas, Matplotlib, Seaborn
- **Tools and other Skills:** Docker, Bash Scripting, L<sup>A</sup>T<sub>E</sub>X, Google Earth Engine