# Ahsan Jalil Mirza

Computer Vision Engineer
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Saarbrücken, Germany

Engineer and researcher with 3+ years of experience in Machine Learning, Image Signal Processing (ISP), and 3D Computer Vision. Specialized in low-light enhancement, ISP pipelines, energy-efficient and neuromorphic ML, and 3D reconstruction (inverse rendering, SDF, egocentric pose) on embedded and edge platforms.

## Work Experience

**Junior Researcher** Oct 2023 – Jul 2024 (Part-time)
Deutsches Forschungszentrum für Künstliche Intelligenz (DFKI) *Saarbrücken, Germany*

- Designed NLP and Vision use cases for neuromorphic chips and hybrid DL-neuromorphic architectures for improved energy efficiency.
- Built a Python toolbox to benchmark AI carbon footprint, reducing evaluation time by 40%.
- Developed and deployed a drone-based vision system on NVIDIA Jetson for automated, energy-efficient steel scrap sorting.

**Research Assistant** Jul 2022 – Sep 2023 (Part-time)
Saarland University *Saarbrücken, Germany*

- Proposed an adversarial OOD detection model for Graph Neural Networks, improving AUROC by 7% on benchmarks.
- Tutored 50 students in Data Science, mentoring on ML, Python, and projects; boosted project quality.

**Senior Algorithm Engineer** Jun 2021 – Apr 2022 (Full-time)
10xEngineers *Lahore, Pakistan*

- Designed and optimized ISP algorithms (demosaicing, sharpening, denoising) for cost-efficient hardware.
- Created a gradient-based demosaicing algorithm achieving 38 dB PSNR with fewer artifacts than competitors.
- Delivered an ML-driven sharpening pipeline with skin-tone detection, improving SSIM by 9%.
- Built an in-house ISP benchmarking lab, saving significant CAPEX, and developed ML training programs for hires and universities.

**Algorithm Engineer** Jul 2020 – May 2021 (Full-time)
Lampró Méllon (now Rapid Silicon) *Lahore, Pakistan*

- Developed ISP algorithms (demosaicing, denoising) for SoC Vision Cores with hardware-friendly designs.
- Simulated DL networks (AlexNet, ResNet, U-Net) on Nvidia NVDLA to support neural accelerator development.
- Designed a lightweight CNN for ultra-low-light denoising, ranking $15^{\text{th}}$ in the NTIRE21 Real Image Denoising Competition.

**Intern** Jun 2018 – Aug 2018 (Full-time)
Siemens *Lahore, Pakistan*

- Programmed SCADA and PLC systems for industrial monitoring and automation.

## Education

**Masters in Visual Computing** Oct 2022 – Sep 2025
Saarland University *Saarbrücken, Germany*
**Relevant coursework:** Image Processing and CV, 3D Computer Vision, Embedded Systems, Photorealistic 3D Reconstruction, Computer Graphics

- **Thesis:** *Joint Egocentric Pose Estimation, 3D Reconstruction and Inverse Rendering Pipeline*
- Designed an end-to-end pipeline combining egocentric pose estimation and physically-based inverse rendering to produce photorealistic 3D digital twins from RGB images, achieving state-of-the-art accuracy using Signed Distance Functions (SDFs) and novel multi-view capture.

**Bachelors in Electrical Engineering** Aug 2016 – Jul 2020
National University of Computer and Emerging Sciences *Lahore, Pakistan*

## Skills

**Programming and Tools:** Python, C++, MATLAB, PyTorch, TensorFlow, OpenCV, Docker, Linux, Git, CI/CD
**Algorithms and Domains:** ISP Pipelines, low-light enhancement, energy-efficient and neuromorphic ML, 3D reconstruction (inverse rendering, SDF, egocentric pose), transformers, GNNs, OOD detection
**Deployment:** Embedded systems, NVIDIA Jetson, CUDA, TensorRT, ONNX, model optimization
**Evaluation:** PSNR, SSIM, AUROC, benchmarking, energy-to-performance profiling

## Languages

English (C1) — German (A2) — Urdu (Native)

## Honors and Certifications

**Image Processing in Python** – DataCamp (ID: 18,844,342)
**Dean's List Member – Bachelors** – Dec 2019

## Publications

Muqudas Rafiq, Ahsan Jalil, Khurram Usman, Muhammad Abdullah, Bilal Zafar, "Multi-Scale Feature Matching for Image Denoising using Residual Swin Transformers" in Electronic Imaging, 2025, pp 227-1 - 227-6