SAQIB NAZIR

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RESEARCH EXPERTISE

Computer Vision researcher with expertise in multimodal sensing, 3D vision, medical imaging, and deep learning systems for complex geometric and physical environments. Research focus on 3D reconstruction, multi-view geometry, scene understanding, and deep generative modelling, with applications in XR/AR and medical imaging.

WORK EXPERIENCE

Research Associate April 2025 - present
IVC Lab, Edgehill University *Ormskirk, UK*

- Developing deep learning models for single-cell analysis, focusing on representation learning for cellular heterogeneity, multimodal data integration, and interpretable modelling of biological structure–function relationships
- Focus on morphological classification of individual cells (sperm, skin, blood), cell integrity (intact vs fragmented)
- Integrated LLM-assisted reasoning modules for biologically grounded interpretation of model predictions, improving explainability and responsible deployment of AI systems in high-stakes biomedical settings
- Multi-modal analysis combining microscopy imaging with molecular data for joint representation learning of cellular state
- Applications: Forensic science, clinical diagnostics, precision medicine, DNA analysis

Research Associate Jan 2024 - April 2025
IMAGE, GREYC Lab, CNRS, University of CAEN *Caen, France*

- Designed generative graph neural networks for geometric and color completion of high-resolution 3D facial scans
- Designed graph neural network for geometric and color completion of high-resolution 3D facial scans
- Worked on multi-view reconstruction, spatial scene understanding, and geometry processing for AR/VR/XR applications and interactive 3D environments
- Developed high-performance deep learning pipelines for large-scale 3D geometric data processing using GPU acceleration

Research Assistant Jan 2021 - Dec 2023
CEOSpace Tech Lab, University POLITEHNICA of Bucharest *Bucharest, Romania*

- Developed deep learning methods for monocular depth estimation, depth-from-defocus (DFD), and image restoration
- Developed computer vision pipelines for spatial perception, depth sensing, and real-time scene understanding
- Worked on 3D scene reconstruction and spatial understanding using visual and optical imaging cues
- Contributed to multimodal sensing research integrating optical imaging and depth estimation technologies
- Worked with Time-of-Flight (ToF) camera systems and depth sensing for indoor 3D environment reconstruction

Research Assistant Sep 2018 - Feb 2020
MIDL-NCAI, COMSATS University Islamabad *Islamabad, Pakistan*

- Developed AI/ML models for clinical medical imaging with focus on diagnostic accuracy
- Developed GANs for noise removal in lung cancer CT scans, improving diagnostic image quality for radiologists
- Collaborated with medical professionals ensuring AI model outputs aligned with clinical requirements and regulatory standards
- Worked with complex biomedical imaging datasets requiring ethical consideration and patient privacy protection

Web Developer Feb 2016 - Sep 2017
FrizCon & F3Tech Web Solution *Islamabad, Pakistan*

- Web development using using PHP, WordPress, and HTML

EDUCATION

PhD. Electronics, Telecommunications and Information Technology, National University of Science and Technology POLITEHNICA of Bucharest 2021-2023

- Thesis Title: Deep Depth from Defocus (Deep DFD) for near range and in-situ 3D exploration
- Early Stage Researcher in the framework of EU Marie Curie innovative training network project $MENELAOS^{NT}$

Visiting Researcher, Ingeniería INSITU University of Vigo Spain Feb 2022 - Aug 2022

- Research secondment in the framework of the EU Marie Curie innovative training network project $MENELAOS^{NT}$
- Time of Flight Camera to capture the depth of indoor environments
- iDFD: A Dataset Annotated for Depth and Defocus

Visiting Researcher, CiTiUS, University of Santiago De Compostela, Spain Sep 2021 - Dec 2021

- Research secondment in the framework of the EU Marie Curie innovative training network project $MENELAOS^{NT}$
- Generative models for DFD and Image Deblurring
- 2HDED:NET for joint Depth Estimation and Image Deblurring

Master of Computer Science, COMSATS University Islamabad, Pakistan Sep 2017 - Feb 2020

- Thesis Title: Generative Adversarial Networks for Enhancing Low-Dose CT Scans
- Computer Vision, Deep Learning, Machine Learning, Cloud Fog Computing

Bachelor of Computer Science, COMSATS University Islamabad, Pakistan Sep 2012 - Aug 2016

- Thesis Title: National Health Service (NHS) a centralized web system for Pakistan

PROJECTS

MENELAOS-NT – Multimodal Environmental Exploration Systems - Novel Technologies European Training Network (ETN) H2020-MSCA-ITN project (Grant No. 860370), Role: Early Stage Researcher (ESR 5), Project goal: The project applies Novel Technologies to realize multimodal – multi-sensor data fusion to optimally combine the information, delivered by different sensors (in-situ/remote, optical/non-optical) on different scales, with different resolutions and with different reliability, 2021-2024 (Link)

COSURAI (Completion of Surfaces by Artificial Intelligence) within the COSURAI project my job is to design methods and algorithms to perform geometric and color completion on 3D colored meshes of people scans, aiming at using artificial intelligence techniques based on generative neural networks, which have shown their benefits for image completion, but have not yet been fully explored for 3D mesh completion. The techniques and algorithms developed will be exploited in the consolidation of 3D scans of people to create 3D avatars for extended reality. 2024-2025 (Link)

SCAnDi: Single-cell and single molecule analysis for DNA identification Developing AI-powered cell phenotyping with LLM-based biological reasoning for forensic applications. Develop interpretable deep learning models that generate biologically grounded explanations using LLMs, advancing transparency and trustworthiness in AI-assisted forensic analysis. Focus on responsible AI deployment in high-stakes decision-making contexts. 2025-2026 (Link)

SELECTED PUBLICATIONS

- N. Saqib, and A. Behera, "Interpretable Single-Cell Phenotyping via Morphology-Aligned Concept Bottlenecks." ready to be submitted.

- N. Saqib, and A. Behera, "Towards Label-Free Single-Cell Phenotyping Using Multi-Task Learning." accepted for presentation at ICPR 2026.
- N. Saqib, and A. Behera, "Hybrid Inception-ViT Networks for Fine-Grained Single-Cell Image Classification." IEEE International Symposium on Biomedical Imaging (ISBI), 2026.
- N. Saqib, and A. Behera, "Attention-Guided U-Net for Cell Nucleus Segmentation in Microscopy Images." Bioimaging 2026.
- M. Azeem, N. Saqib, and A. Behera, "Context-Aware Graph Neural Network for Skin Lesion Classification." ACM Symposium on Applied Computing (SAC), 2026.
- N. Saqib, and A. Behera, "Single Cell Segmentation Evolution: From Traditional to Deep Learning Approaches." IEEE JOURNAL OF BIOMEDICAL AND HEALTH INFORMATICS.
- N. Saqib, O. Lezoray, and S. Bougleux, "3DGeoMeshNet: A Multi-Scale Graph Auto-Encoder for 3D Mesh Reconstruction and Completion." NeuroComputing.
- N. Saqib, O. Lezoray, and S. Bougleux, "Self-Attention Based Multi-Scale Graph Auto-Encoder Network of 3D Meshes." accepted for presentation at IEEE International Joint Conference on Neural Networks, 2025.
- N. Saqib, O. Lezoray, and S. Bougleux, "3D Shape and Color Completion: A review." submitted to ACM Transactions on Graphics.
- N. Saqib, and R. Asiyabi, "Joint Underwater Depth Estimation and Dehazing from a Single Image using Attention U-Net." Design and Architectures for Signal and Image Processing, 2024.
- N. Saqib, L. Vaquero, M. Mucientes, V. M. Brea and D. Coltuc, "Depth Estimation and Image Restoration by Deep Learning from Defocused Images." IEEE Transactions on Computational Imaging, vol. 9, pp. 607-619, 2023.
- N. Saqib, C. Damian, and D. Coltuc. "Self-supervised Defocus Map Estimation and Auxiliary Image Deblurring Given a Single Defocused Image." Accepted In IEEE Digital Image Computing: Techniques and Applications (DICTA), Port Macquarie, New South Wales, Australia, 2023.
- N. Saqib, Z. Qiu, D. Coltuc, J. Sánchez, and P. Arias. "iDFD: A Dataset Annotated for Depth and Defocus." In Scandinavian Conference on Image Analysis, pp. 67-83. Cham: Springer Nature Switzerland, 2023.
- N. Saqib, L. Vaquero, M. Mucientes, V. M. Brea, and D. Coltuc. "2HDED: Net for Joint Depth Estimation and Image Deblurring from a Single Out-of-Focus Image." In 2022 IEEE International Conference on Image Processing (ICIP), pp. 2006-2010. IEEE, 2022.
- N. Saqib, and D. Coltuc. "Edge-preserving smoothing regularization for monocular depth estimation." In 2021 26th International Conference on Automation and Computing (ICAC), pp. 1-6. IEEE, 2021.

TEACHING

- "Introduction to Machine Learning" Masters level course of the Computer Science Department of the University of Caen and of the ENSICAEN, France
- "Digital Image Processing" Bachelors level course of the Computer Science Department at the COMSATS University Islamabad, Pakistan

SKILLS

Programming Languages	Python, C++, MATLAB, JavaScript
Deep Learning	PyTorch (Expert), TensorFlow, CUDA
Computer Vision	3D Vision, Depth Estimation, Scene Understanding, Object Recognition, Image S
AI Systems & Deployment	FastAPI, Flask, Docker, ONNX Runtime, GPU Inference, Linux-based AI Workfl
XR / Spatial Computing	AR/VR/XR, 3D Reconstruction, Mesh Processing, Spatial AI, Multi-view Geome
Tools & Infrastructure	Git, Git LFS, Linux, Jupyter, Google Colab, VS Code, PyCharm
Frameworks & Libraries	OpenCV, NumPy, SciPy, Scikit-learn, React-Native
Leadership & Communication	Research Supervision, Teaching, Scientific Writing, Technical Presentations

LANGUAGES

English - (C1), Urdu - (Native), Spanish - (A1), French - (A1)

FELLOWSHIPS, AWARDS, AND CERTIFICATES

- MSCA Doctoral Scholarship: from the European Union's Horizon 2020
- PEEF Scholarship for Master's Level Education
- Fully Funded Merit Scholarship for Bachelors Degree at COMSATS University Islamabad
- Certificate of the 8th International School on Deep Learning 2021 summer school, Las Palmas de Gran Canaria, Spain

REFRENCES

Prof. Daniela Coltuc - PhD Thesis Supervisor

- Full Professor of Electronics, telecommunications, and information technology at the National University of Science and Technology POLITEHNICA Bucharest, Romania
- CEOSpaceTech Research Center for Spatial Information
- Address: No. 7 Gheorghe Polizu str., Building P, 1st. floor 011061, Sector 1, Bucharest
- Email: daniela.coltuc@upb.ro

Prof. Mihai Datcu- PhD Thesis Supervisor

- German Aerospace Center (DLR), Earth Observation Center, Remote Sensing Technology Institute
- Full Professor of Electronics, Telecommunications, and Information Technology at the National University of Science and Technology POLITEHNICA Bucharest, Romania
- CEOSpaceTech Research Center for Spatial Information
- Address: No. 7 Gheorghe Polizu str., Building P, 1st. floor 011061, Sector 1, Bucharest
- Email: mihai.datcu@upb.ro

Prof. Olivier LÉZORAY- PostDoc Cordinator

- Full Professor of Computer Science at the University of Caen in the Multimedia and Internet Department of the West Normandy Institute of Technology.
- Address: GREYC UMR CNRS 6072 LAB, Caen, Normandy, France
- Email: olivier.lezoray@unicaen.fr