NUMAN SAEED

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LinkedIn
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Research Interests

My research interests lie at the intersection of deep learning, multimodal data integration, and applied machine learning for healthcare and imaging. I focus on developing robust segmentation, classification, and survival prediction models, with an emphasis on self-supervised learning, continual learning, and domain generalization. Additionally, I am interested in exploring innovative applications of large language models (LLMs) and generative AI to enhance multimodal representation learning and improve decision-making in real-world scenarios, particularly in medical imaging and personalized healthcare.

Experience

Postdoctoral Researcher — 2024 - Present
Mohamed bin Zayed University of Artificial Intelligence (MBZUAI) — Abu Dhabi, UAE
- Developed the pioneering Fetal Ultrasound Foundation model, setting a benchmark for advanced fetal imaging analysis.
- Collaborating with GE Healthcare to classify fetal heart abnormalities using Vision-Language Models (VLMs) in ultrasound videos.
- Predicting cancer diagnosis outcomes (prognosis) by integrating and analyzing multi-modal data, advancing precision oncology.

Senior Machine Learning Scientist — 2024 - Present
LabibAI — Abu Dhabi, UAE
- Driving innovation through the design and deployment of Large Language Model (LLM)-based solutions, enhancing business processes and delivering customized solutions to meet diverse client needs

Visiting Researcher — 2023 - 2024
Technical University of Munich (TUM) — Munich, Germany
- Contributed to the development of a self-supervised spatio-temporal UNet for kinetic modeling of FDG dynamic PET data, facilitating micro-parameter estimation at the voxel level with physiologically informed constraints and clinical applicability.

Graduate Research Assistant — 2021 - 2023
Mohamed bin Zayed University of Artificial Intelligence (MBZUAI) — Abu Dhabi, UAE
- Developed multimodal machine learning models combining imaging (CT, PET, MRI) and electronic health records (EHR) to improve cancer prognosis and segmentation.
- Implemented a Transformer-based Multimodal Network (TMSS) for joint segmentation and survival prediction of head and neck tumors, achieving 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.

Senior Data Scientist — 2019 - 2020
Etihad Airways — Abu Dhabi, UAE
- Designed and implemented time series forecasting models (classical methods, 1D-CNN, and LSTM) for passenger bookings and ancillary revenue optimization.
- Developed econometric models to analyze key business drivers (e.g., marketing, pricing, trade) influencing booking trends.
- Created an engagement score metric using k-Nearest Neighbors (kNN) for customer segmentation and classification.

Research Assistant/Engineer   2015 - 2019
Masdar Institute of Science and Technology   Abu Dhabi, UAE
- Developed deep learning models to estimate defect depth in composites, improving predictive accuracy and material analysis.
- Using thermographic imaging, convolutional neural networks (CNNs) automatically detect defects in composite structures.
- Supervised graduate students, providing mentorship and guidance on research projects.

Education

Ph.D. in Machine Learning   2021 - 2023
Mohamed bin Zayed University of Artificial Intelligence   Abu Dhabi, UAE
(15th in CS rankings in AI/ML/CV/NLP)
- *Advisors:* Prof. Mohammad Yaqub, Prof. Karthik Nandakumar, and Prof. Bin Gu
- *Thesis title:* Deep Learning for Cancer Diagnosis and Prognosis

Masters in Microsystems   2015 - 2016
Masdar Institute of Science and Technology   Abu Dhabi, UAE
(in collaboration with MIT)
- *Advisors:* Prof. Jaime Viegas, Prof. Ibrahim Elfadel, and Prof. Jerald Yoo
- *Thesis title:* Characterization of Piezoelectric Micromachined Ultrasonic Transducers in Mechanical, Electrical and Acoustic Domains

Bachelors in Electrical Engineering   2009 - 2013
National University of Computer and Emerging Sciences   Islamabad, Pakistan
- Graduated with Gold, Silver, and Bronze Medals across semesters; included five times on the Dean's List and once on the Rector's List of Honors.

Technical Skills

Languages: Python, C++, MATLAB, SQL
Programming: PyTorch, Keras, TensorFlow, Scikit-learn, OpenCV, HuggingFace
Developer Tools: Linux, VS code, Git, PowerBi, AWS

Teaching and Supervision Experience

Supervision
Mohamed bin Zayed University of Artificial Intelligence (MBZUAI)   Abu Dhabi, UAE
- Mentored Masters and Ph.D. students   2022-Present

Teaching Assistant
Mohamed bin Zayed University of Artificial Intelligence (MBZUAI)   Abu Dhabi, UAE
- CV805: Life-long Learning   2023
- HC701: Medical Imaging: Physics and Analysis   2023
- AI702: Deep Learning   2022
- ML701: Machine Learning   2021, 2022

Awards

- MICCAI Young Scientist Grant Award   2024
- Student Travel Award for MICCAI Conference   2022
- First Place on the HECKTOR 2021 Challenge (MICCAI Conference)   2021
- Graduate Student Fellowship for Ph.D. at MBZUAI   2021
- Graduate Fellowship for Masters at Masdar Institute of Science and Technology   2015

List of Selected Publications

- Aleksandr Matsun, **Numan Saeed**, Fadillah Adamsyah Maani, Mohammad Yaqub. *"ConDiSR: Contrastive Disentanglement and Style Regularization for Single Domain Generalization".* **IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) 2025.**
  📄 Paper 🔇 Code

- Qazi, Mohammad Areeb, Anees Ur Rehman Hashmi, Santosh Sanjeev, Ibrahim Almakky, **Numan Saeed**, and Mohammad Yaqub. *"Continual Learning in Medical Imaging from Theory to Practice: A Survey and Practical Analysis."* **Under Review (2024).**
  📄 Paper 🔇 Code

- **Numan Saeed**, Muhammad Ridzuan, Fadillah Adamsyah Maani, Hussain Alasmawi, Karthik Nandakumar, and Mohammad Yaqub. *"SurvRNC: Learning Ordered Representations for Survival Prediction using Rank-N-Contrast."* **27th International Conference on Medical Image Computing and Computer Assisted Intervention Society (MICCAI) 2024.**
  📄 Paper 🔇 Code

- Saadi, Nada, **Numan Saeed**, Mohammad Yaqub, and Karthik Nandakumar. *"PEMMA: Parameter-Efficient Multi-Modal Adaptation for Medical Image Segmentation".* **27th International Conference on Medical Image Computing and Computer Assisted Intervention Society (MICCAI) 2024.**
  📄 Paper

- Maani, Fadillah Adamsyah, **Numan Saeed**, Aleksandr Matsun, and Mohammad Yaqub. *"CoReEcho: Continuous Representation Learning for 2D+ time Echocardiography Analysis".* **27th International Conference on Medical Image Computing and Computer Assisted Intervention Society (MICCAI) 2024.**
  📄 Paper 🔇 Code

- Ridzuan, Muhammad, Mai Kassem, **Numan Saeed**, Ikboljon Sobirov, and Mohammad Yaqub. *"HuLP: Human-in-the-Loop for Prognosis".* **27th International Conference on Medical Image Computing and Computer Assisted Intervention Society (MICCAI) 2024.**
  📄 Paper 🔇 Code

- Abutalip, Kudaibergen, **Numan Saeed**, Mustaqeem Khan, and Abdulmotaleb El Saddik. *"Improving stain invariance of cnns for segmentation by fusing channel attention and domain-adversarial training".* **International Conference on Medical Imaging with Deep Learning (MIDL) 2023**.
  📄 Paper

- **Numan Saeed**, Muhammad Ridzuan, Hussain Alasmawi, Ikboljon Sobirov, and Mohammad Yaqub. *"MGMT promoter methylation status prediction using MRI scans? An extensive experimental evaluation of deep learning models."* **Medical Image Analysis (MedIA Journal) 2023**.
  📄 Paper

- **Numan Saeed**, Muhammad Ridzuan, Roba Al Majzoub, and Mohammad Yaqub. *"Prompt-Based Tuning of Transformer Models for Multi-Center Medical Image Segmentation of Head and Neck Cancer."* **Journal of Bioengineering 2023**.
  📄 Paper

- Sobirov, Ikboljon, **Numan Saeed**, and Mohammad Yaqub. *"Super Images-A New 2D Perspective on 3D Medical Imaging Analysis."* **27th Annual Conference on Medical Image Understanding and Analysis (MIUA) 2023**.
  📄 Paper

- **Numan Saeed**, Shahad Hardan, Kudaibergen Abutalip, and Mohammad Yaqub. *"Is it possible to predict MGMT promoter methylation from brain tumor MRI scans using deep learning models?."* **International Conference on Medical Imaging with Deep Learning (MIDL) 2022**.
  📄 Paper

- **Numan Saeed**, Ikboljon Sobirov, Roba Al Majzoub, and Mohammad Yaqub. *"TMSS: an end-to-end transformer-based multimodal network for segmentation and survival prediction".* **25th International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI) 2022.**
  📄 Paper Code

- **Numan Saeed**, Roba Al Majzoub, Ikboljon Sobirov, and Mohammad Yaqub. *"An ensemble approach for patient prognosis of head and neck tumor using multimodal data."* **3D Head and Neck Tumor Segmentation in PET/CT Challenge (MICCAI) 2021.**
  📄 Paper Code

Patents

- **Numan Saeed**, Ikboljon Sobirov, Roba Majzoub, Mohammad Yaqub, "Deep learning apparatus and method for segmentation and survival prediction for head and neck tumors", US Patent. Pub. No. US 2023/0414189 A1. USPTO application no.: 17849943

References

Prof. Mohammad Yaqub, MBZUAI; mohammad.yaqub@mbzuai.ac.ae

Prof. Salman Khan, MBZUAI; salman.khan@mbzuai.ac.ae

Prof. Karthik Nandakumar, MBZUAI; karthik.nandakumar@mbzuai.ac.ae

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Prof. Mahmoud Rasras, NYU; mr5098@nyu.edu