

ZEESHAN MEMON

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[🌐 /Zeesh-an](#)

PROFESSIONAL CAREER OBJECTIVE

Seeking a research-focused position in Machine and Deep Learning, where I can collaborate with a team of seasoned professionals, delve into state-of-the-art technologies, and produce influential research publications to advance the field.

EDUCATION

Bachelors of Software Engineering, National University of Science and Technology 2020- 2024

CGPA: 3.98/4.0

Class Rank: 1/90

Specialization: Deep Learning, Computer Vision & Representation Learning

Relevant Coursework: Datastructures and Algorithms, Machine Learning, Database Sytems, Numerical Methods, Augmented and Virtual Reality

PUBLICATIONS

Content-Aware Urdu Handwriting Generation  Aug 2023

Zeeshan Memon, Adnan-ul-Hassan & Faisal Shafait

The 17th International Conference on Document Analysis and Recognition (ICDAR) *San José, California, USA*

PROFESSIONAL EXPERIENCE

OpenLab Summer Student Jun 2023 - Aug 2023

CERN *Geneva, Switzerland*

- Developed and implemented an Autoregressive Vector-quantized Variational Autoencoders (VQ-VAE) architecture.
- Focused on optimizing loss functions and preprocessing techniques for transformer-based implementations.
- Supervised by: [Dr. Dalila Salamani](#) and Piyush Raikawar

Teaching Assistant Sep 2022 - Jan 2023

School of Electrical Engineering and Computer Sciences, NUST *Islamabad Pakistan*

- Managed semester projects, including requirement design and evaluation criteria.
- Provided proactive guidance and conducted fair semester project evaluations.
- Course: Data structures and Algorithms (DSA), Design and Analysis of Algorithms(DAA)

Research Fellow Jun 2022 - Sep 2022

Hochschule RheinMain *Wiesbaden, Hessen, Germany*

- Used Auto-Encoders for super resolution of satellite imagery
- Attained results on par with state-of-the-art supervised learning methods using unsupervised method.
- Experimented different multi-modal spatial fusion techniques for super resolution task

Supervised by: [Dr. Adrian Ulges](#) , [Dr. Ulrich Schwanecke](#)

Research Intern Jun 2021 - Present

TUKL-NUST R&D Lab on Artificial Intelligence and Machine Learning *Islamabad, Pakistan*

- Worked with GANs and Transformers with novel Pre-trained recognizer network loss for urdu handwriting generation.
- Developed Convolutional Recurrent Neural Networks (CRNNs) based system for task of Urdu Handwriting Recognition (OCR for low-resource languages)

Supervised by: [Dr. Faisal Shafait](#)

RESEARCH PROJECTS

Machine Learning for Fast Simulation

- Utilized VQVAEs for fast simulation and improved baseline transformer-based calorimeter shower generation.
- Achieved challenging metric, cell distribution, with logarithmic scaling and Mean Square Error loss function.
- Dataset: [Geant IV Simulator Data](#)

Super Resolution of Satellite Images </>

- Implemented Unsupervised Sparse Dirchilet Net, proved best among all in fusing multi-spectral and hyper-spectral images.
- Attained results on par with state-of-the-art supervised learning methods using unsupervised method.
- Datasets used: [Berlin Satellite Data](#), [provide by EnMAP](#).

Urdu Handwriting Generation using GANs

- Used Generative Adversarial Networks for Urdu Handwriting Generation and proposed novel pre-trained recognizer network.
- Proposed new evaluation metric of "Recognition Accuracy" for handwriting generation tasks.
- Published work at ICDAR (A-Ranked Computer Science Conference on Document Analysis).

Semantic Search Engine

- Optimized BERT Encoder for Question Pair Matching using the Quora Question Dataset.
- Additionally, harnessed Siamese Encoding to produce high-dimensional sentence embeddings, facilitating efficient cosine similarity indexing.

OCR for Pakistani CNICs and Passports

- Designed filters for preprocessing and denoising images to improve results of EasyOCR.
- Used Faster-RCNN for localization, EasyOCR for English text recognition and NER tagging for identifying tags.
- Used CRNN(Convolutional-Recurrent Neural Networks) for task of Urdu Text Recognition.

ACHIEVEMENTS

- Selected as prestigious Openlab Researcher at CERN from pool of 2000 candidates (1.5% acceptance rate).
- Awarded prestigious MBZUAI undergraduate fully funded research internship.
- Awarded DAAD fully funded research internship.
- Got Merit Based Scholarship for 6 consecutive semesters.
- 6th Rank in High School Examination from pool of 24000 candidates.
- Secured 3rd position in HackFest(Hackathon for Intelligent Recommendation System)

SKILLS

ML Libraries and Frameworks: PyTorch, TensorFlow, Numpy & OpenCV

Programming Languages: Python, C, C++ & Java

Domain Expertise: Generative Modelling, Advanced Architectures: CNNs, RNNs, Transformers, GNNs

Soft Skills: Problem-solving, Teamwork, Effective Communication