

Ali Mikaeili

Frankfurt · Germany · Ali.Mikaeili@brain.mpg.de · (+49)1575 7252 676 ·

EDUCATION

University of Tehran

Master of Science, Artificial Intelligence and Robotics, Grade:17/20

– Thesis: *SpikeReg; A Spiking-UNet for Iterative Deformable Brain Image Registration*

Tehran, Iran

2023–2025

Payame Noor University

Bachelor of Engineering, Computer Engineering, Grade:16.5/20

– Thesis: *Predicting Diabetes using Machine learning algorithms*

Ardabil, Iran

2020–2023

Farhangian University

Bachelor's in Educational Sciences, Grade:17.5/20

– Thesis: *human learning processes and development, combining knowledge of educational sciences.*

Ardabil, Iran

2017–2021

WORK EXPERIENCE

[Linkedin](#)

Max Planck institute for brain Research (MPIBR)

Research Assistant, Dept. of Neural System (under supervision of Prof. Gilles Laurent)

- Designing a network for unsupervised synapse clustering based on morphological features using Contrastive learning.
- Designing a representation learning framework for Cell Classification using Vision Transformers.

Frankfurt, Germany

2024–present

Hamrahe Aval (MCI), Mobile Communication Company of Iran

Data analyst, Image Analysis Group, Research and Development Department(R and D)

- Engaged in the development of Text-to-Speech (TTS) and Emotion Speech Recognition (ESR) projects at Hamrah Aval company in preparation for the prestigious international GITEX exhibition.
- Product Manager for the Persian-Interactive Dog Robot Project

Tehran, Iran

2023–2024

University of Tehran

Teaching Assistant, Dept. of Computer Science & Electrical Engineering

- Head of Four Research Teams in AI-Driven Medical Imaging and deep learning Projects under the Supervision of Professor Moshiri and Professor Khoshnevisan.
- Assisted in teaching Statistical Inference, course given by Dr. Abolghasemi Dehaghani.
- Assisted in teaching Artificial Intelligence, course given by Prof. Mohammad Khoshnevisan.

Tehran, Iran

2023–2024

Payame Noor University

Teaching Assistant, Dept. of Computer Science & Engineering

- Assisted in teaching Data Structures and Algorithms, engaging students through in-class instruction and interactive video demonstrations.
- Contributed to the Artificial Intelligence Course by crafting challenging homework assignments, meticulously grading tests, and leading engaging hands-on sessions.
- Supported the Operating System Course by facilitating dynamic hands-on classes and designing comprehensive midterm assessments

Ardabil, Iran

2020–2023

SKILLS

AI: Representation Learning, Contrastive Learning, Spiking Neural Networks ,VLM ,NLP, RAG, Bert, GAN, Transformers, Diffusion models, Image processing, Digital Twin

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

Neuroscience: Connectomics, Webknossos

Machine Learning tools: Pytorch, Keras, Tensorflow, NumPy, Pandas, Scikit-Learn, Matplotlib

Other skills: Git, L^AT_EX, Linux, Flutter, Docker

Languages: English(Advanced), Persian(Native), Azerbaijani(Native), Turkish(advanced),

SELECTED COURSES

- **University of Tehran (M.Sc):** Machine Learning, Neural Network and Deep Learning, Statistical Inference, Natural Language Processing, Data Fusion, Explainable AI and Trustworthy
- **Payame Noor University, Bachelors:** Linear Algebra, Probability and Statistics, Calculus (Engineering Mathematics), Data Structures and Algorithms, Theory of Computation, Object-Oriented Programming, Principles of Computational Intelligence, Artificial Intelligence, Advanced Algorithm Design, Signals and Systems Analysis, Discrete Mathematical Structures
- **Online Audited Courses:** Foundations of Deep Learning, Deep Reinforcement Learning, Generative Adversarial Networks (GANs), Deep Learning for Computer Vision, Machine Learning with Graphs

PUBLICATIONS (SELECTED)

- A. M. Barzili and B. Moshiri, "Attention-Based Segmentation of Brain Tumors Using Feature Level Fusion and UNet Architecture," *2025 Fifth National and the First International Conference on Applied Research in Electrical Engineering (AREE)*, Ahvaz, Iran, Islamic Republic of, 2025, pp. 1-6, doi: 10.1109/AREE63378.2025.10880261.
- A. E. Zadeh, A. M. Barzili, M. R. Nemati, M. Khoshnevisan, H. Azadegan and B. Moshiri, "Detection of Autism Spectrum Disorder Using Quantum Support Vector Machines Algorithm," *2025 International Conference for Artificial Intelligence, Applications, Innovation and Ethics (AI2E)*, Muscat, Oman, 2025, pp. 1-6, doi: 10.1109/AI2E64943.2025.10983511.

PUBLICATIONS (UNDER REVIEW)

- A. M. Barzili and B. Moshiri, "SpikeReg: A Spiking-UNet for Iterative Deformable Brain Image Registration"
- A. M. Barzili and B. Moshiri, "LiquidReg: an adaptive ODE engine for deformable registration"
- A. M. Barzili, A. Firoozi, S. Asadollahi, S. Famil Feizi and B. Moshiri, "Deep Learning Methods for Deformable Brain MRI Registration: A Systematic Review"

PROJECTS

GitHub

- A deep learning framework for analyzing and clustering 3D synapse structures from electron microscopy (EM) data, developed at the Max Planck Institute for Brain Research in Frankfurt, Germany.
- SpikeReg: A novel approach to deformable medical image registration that leverages Spiking Neural Networks (SNNs) to achieve orders-of-magnitude energy savings while maintaining high registration accuracy.
- Chromatin Classification: This project provides tools for analyzing and classifying 3D nuclei samples using deep learning.
- LiquidReg: A revolutionary approach to deformable medical image registration by combining Liquid Time-constant Networks (LTC) for adaptive dynamics, diffeomorphic transformations via scaling squaring, hyper-networks for pair-specific parameter generation, and continuous-time ODE solvers for smooth deformation fields.
- Developed a predictive model for identifying **suicidal thoughts** in social network users based on their tweet content, contributing to mental health awareness and intervention efforts.
- Engineered a robust **Speech Emotion Recognition** system using the Shemo Persian speech emotion detection database, enabling accurate classification of emotional states from speech signals.
- Conducted fine-tuning of the BERT model tailored for the Persian language, enhancing its performance in natural language processing tasks specific to Persian text.
- Employed Generative Adversarial Networks (GAN) to generate a synthetic version of the **MNIST Dataset**, facilitating research and development in computer vision and machine learning.
- Implemented Adaptive Synthetic Sampling techniques to improve the effectiveness of **Credit Card Fraud Detection**, enhancing the security measures in financial transactions.
- Contributed to the **ControlVAE** project by generating pictures using Control VAE, advancing research in variational autoencoders and image generation.
- and etc.