Arash Keshavarz

Machine Learning Engineer

Rostock, Germany • +49-15236718148 • arash.keshavarz.dev@gmail.com GitHub LinkedIn

Aspiring Machine Learning Engineer with 2+ years of Python experience, having developed and deployed deep learning models for computer vision, image analysis, and audio classification tasks. Designed end-to-end pipelines and applied neural networks to solve real-world problems with scalable, data-driven solutions.

SKILLS

Programming: Python, Java, MATLAB
Libraries & Frameworks: PyTorch, TensorFlow, OpenCV, Scikit-learn, Torchvision, Albumentations
Tools & Technologies: Git, GitLab, Docker, Gradio, Streamlit, MongoDB, Linux, AWS, Google Colab, Jupyter
Languages: Persian (Native), English (C1), German (B1)
Certificates: Deep Learning Udacity course

RELEVANT WORK EXPERIENCE

Fraunhofer IGD, Rostock, Germany 04/2025 – Present
Research Assistant - Machine Learning for Time Series

- Developed a bruise-age estimation pipeline using hyperspectral images (204 spectral bands), achieving **90% prediction accuracy**, and supporting use in medical research.
- Preprocessed large-scale hyperspectral datasets through cleaning, normalization, and feature extraction to enhance ML model performance.
- Applied dimensionality reduction techniques (PCA, t-SNE) to visualize spectral patterns and reduce feature space by over 90%, improving model interpretability.
- Implemented spectral classifiers (SAM, SVM) to analyze bruise evolution over time, supporting comparative model evaluation within a research-grade pipeline.
- Collaborated with a team of 4 researchers via GitLab for version control, code documentation, and cross-review, ensuring a reproducible and modular workflow.

University of Rostock, Rostock, Germany 07/2023 – 03/2025
Research Assistant

- Annotated ECG lead signals from scanned paper records and trained a YOLOv7 object detection model to automate signal digitization, reducing manual extraction time from ~1 hour to under 15 minutes per record across 50+ ECG sheets, enabling faster downstream analysis and clinical research support.
- Collected and labeled spoken digit recordings (0–9) from 7+ participants, applying audio signal segmentation and preprocessing for training CNN and RNN classifiers with 96% test accuracy.
- Developed and optimized preprocessing scripts in Python and MATLAB to clean and analyze multi-channel measurement data, improving signal quality and reproducibility in modeling workflows.
- Simulated hip implant datasets using EIDORS and regularly communicated experimental findings to supervisors, contributing to informed improvements in the reconstruction pipeline.

EDUCATION

University of Rostock, Rostock, Germany 10/2022 – 09/2025
Master of Science — Electrical Engineering and Computer Science

- GPA: 1.7

- Relevant Courses: Artificial Intelligence, Explainable AI, Data-Driven Methods in Signal Processing, Image Processing, Computer Architectures for Deep Learning

Yasouj University 10/2015 – 09/2020

Bachelor of Science — Electrical Engineering

- GPA: 1.7
- Graduated among top 5% of students

Academic Projects

Master Thesis : ML-Based Thigh Muscle Force Estimation Using EIT [github]

- Engineered a data acquisition system with a custom GUI to collect synchronized EIT and torque data from 15 participants, enabling scalable muscle force estimation experiments.
- Extracted and processed ~80,000 data samples for training ML models, applying signal segmentation, cleaning, and feature normalization techniques.
- Evaluated multiple normalization strategies and used PCA for dimensionality reduction and exploratory analysis.
- Trained and validated Random Forest and SVM classifiers to distinguish between force levels (20–80 Nm), achieving up to 91% classification precision.
- **Technologies**: Python, Scikit-learn, CustomTkinter

Y-net for Image Reconstruction in Electrical Impedance Tomography

- Implemented a Y-Net convolutional architecture to improve image resolution in Electrical Impedance Tomography (EIT), outperforming classical reconstruction methods.
- Detected conductivity changes in the bone region to monitor hip stem displacement, reaching 89% Structural Similarity Index (SSIM).
- Generated and preprocessed training datasets using EIDORS-based simulations, aligning reconstructed and ground truth images.
- **Technologies**: MATLAB, Python, PyTorch