

Mohamad Mahayni

Biomedical Engineer | Machine Learning, Signal Processing & Edge AI

Open to relocation across Germany • Available from July 2026

📍 Stuttgart, Germany | 📞 +49 157 393 79668

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🇪🇺 Valid student residence permit, Germany



Profile

Biomedical Engineering M.Sc. candidate (Grade 1.6, expected Jun. 2026) specialising in machine-learning signal analysis, medical imaging, and edge AI. For my thesis I built and benchmarked four ML approaches for bio-acoustic anomaly detection over 43,000+ events across nine measurement campaigns, reaching >95% AUC and F1 on held-out campaigns with a CNN autoencoder compressed to under 150 KB for resource-constrained edge platforms. Additional experience spans radiation-dose estimation from dermoscopic images, CT/MRI DICOM segmentation, and C++ embedded firmware.

Research Experience

Master's Thesis Researcher

Hahn-Schickard

Oct. 2025 – Present

Villingen-Schwenningen, Germany

- Built an end-to-end pipeline transforming 1D bio-acoustic signals (18–120 kHz) into 2D CWT spectrograms; benchmarked four approaches (CNN autoencoder; AE-bottleneck + XGBoost; 1D and 2D wavelet scattering + XGBoost) on 43,000+ events across nine campaigns, reaching >95% AUC and F1 on held-out campaigns.
- Compressed the CNN autoencoder to under 150 KB using Optuna (Bayesian TPE) and a multi-objective Pareto search over accuracy and model size, enabling edge deployment on memory-constrained platforms; validated cost-effective MEMS sensors against industrial-grade references.
- Surfaced a metric-divergence finding (near-ceiling ROC-AUC vs. operational performance on unseen campaigns), validated with campaign-based hold-out and cross-validation.

Projects

Radiation Dose Estimation in Breast Cancer Patients

Anhalt University of Applied Sciences

Apr. 2025 – Oct. 2025

Köthen, Germany

- First systematic pipeline estimating radiotherapy dose (Gray) from dermoscopic RGB skin images: 192 images, 37-dimensional colour + GLCM feature vectors, Leave-One-Patient-Out validation; benchmarked ResNet-18 and Random Forest regression/classification (Python, PyTorch, scikit-learn, OpenCV).

Medical Image Segmentation (3D Slicer, MeVisLab, CT/MRI DICOM)

Anhalt University of Applied Sciences

2024 – 2025

Köthen, Germany

Medical Assistant for the Blind and Visually Impaired

Damascus University

Feb. 2022 – Aug. 2022

Damascus, Syria

- Co-developed a real-time medication-recognition app in Python and OpenCV (SIFT + FLANN) over 600 images, achieving sub-second identification under varied lighting.

Work Experience

Office Assistant

Jawad Veterinary Medicine

Jun. 2020 – Oct. 2023

Damascus, Syria

Education

M.Sc. Biomedical Engineering

Anhalt University of Applied Sciences

Apr. 2024 – Present

Köthen, Germany

- Grade 1.6 (expected graduation Jun. 2026). Coursework: Biomedical Imaging, Computer-Assisted Medicine, Modeling & AI in Biomedical Engineering, Biosignal Processing, Modeling & Simulation.

B.Sc. Biomedical Engineering

Damascus University

Sep. 2015 – Jul. 2022

Damascus, Syria

Skills

- **ML & Deep Learning:** Python (Advanced), PyTorch, TensorFlow, CNNs / Autoencoders, scikit-learn, Optuna, Model Compression, Edge AI / TinyML
- **Signal & Image Processing:** CWT, Biosignal Processing, GLCM Texture Analysis, OpenCV, NumPy, SciPy, MATLAB
- **Medical Imaging:** 3D Slicer, MeVisLab, DICOM, CT/MRI Segmentation, 3D Reconstruction, scikit-image
- **Embedded & Tools:** C++ Firmware, HW–SW Co-design, MEMS Sensors, Git, Docker, Linux, Jupyter, pandas

Languages

Arabic (Native) • English (C1, Fluent) • German (B2)