Amirreza Mahbod

Assistant Professor at Danube Private University
& Part-time Lecturer at Medical University of Vienna

Personal Information

Current Location: Vienna, Austria

Citizenship: Austria & Iran

Primary Email: amirreza.mahbod@dp-uni.ac.at

Secondary Email: amirreza.mahbod@gmail.com

Profile: www.linkedin.com/in/amirreza-mahbod

Education

April 2025 — **Habilitation in Medical Informatics, Biostatistics and Complex Systems**
Medical University of Vienna (Vienna, Austria)
Habilitation Colloquium: *Nuclei Instance Segmentation in Histological Images*

Nov 2016 – Jan 2020 — **PhD in Medical Informatics, Biostatistics and Complex Systems**
Medical University of Vienna (Vienna, Austria) & TissueGnostics GmbH (Vienna, Austria)
GPA: 1.18 in scale of 1 (excellent) to 5 (insufficient)
Thesis title: *Towards Improvement of Automated Segmentation and Classification of Tissues and Nuclei in Microscopic Images Using Deep Learning Approaches* (Link)
Supervisors: Prof. Isabella Ellinger (Medical University of Vienna), Prof. Rupert Ecker (TissueGnostics GmbH)
Funded by the Horizon 2020 research and innovation programme (Link)

Oct 2017 - Jun 2018 — **Visiting Researcher**
KTH Royal Institute of Technology (Stockholm, Sweden)
Research area: *Developing Algorithms for Histological Image Segmentation and Classification Based on Deep Neural Networks*
Supervisors: Dr. Chunliang Wang, Prof. Örjan Smedby

Sep 2014 - Sep 2016 — **M.Sc. in Medical Engineering**
KTH Royal Institute of Technology (Stockholm, Sweden)
Master Thesis title: *Structural Brain MRI Segmentation Using Machine Learning Technique*
Supervisors: Dr. Chunliang Wang

Sep 2009 – Mar 2012 — **M.Sc. in Electrical Engineering – Bioelectric**
Iran University of Science and Technology (Tehran, Iran)
Master Thesis title: *Determining Quality of Fruits by Ultrasonic Waves*
Supervisors: Prof. Hamid Behnam

Sep 2004 – Sep 2009 **B.Sc. in Electrical Engineering – Control**
Iran University of Science and Technology (Tehran, Iran)
Master Thesis title: *Design & Implementation of the Automatic Regulatory System of Car's Headlighte*
Supervisors: Prof. Jahed Motlaghg

Interests

- Deep Learning & Machine Learning
- Medical Image Analysis
- Foundation Models
- Multi-Modal Medical Data Fusion

Work Experiences

Sep 2023 - Present **Assistant Professor at Danube Private University, Austria**
Deep learning/machine learning methods for medical Image analysis
Technical Environment: Deep learning frameworks and computer vision tools

Sep 2022 - Present **Lecturer (part-time) at Medical University of Vienna, Austria**
Institute for Pathophysiology and Allergy Research
Courses: Creative and Critical Journal Club, Diplomand Innen Seminar

Aug 2022 – Aug 2023 **AI Researcher at Danube Private University, Austria**
Deep learning/machine learning methods for medical Image analysis such as segmentation, classification, and detection
Technical Environment: Python, Keras, Tensorflow, PyTorch, Monai, OpenCV, SciPy, Scikit-learn, Pandas, Matplotlib, NumPy, PyCharm, Matlab, Git, Docker, Ubuntu, LaTeX

Apr 2020 – Jul 2022 **Post-doctoral fellow at Medical University of Vienna, Austria**
Deep learning/machine learning methods for computer vision tasks such as segmentation, classification, and detection
Technical Environment: Python, Keras, Tensorflow, PyTorch, OpenCV, SciPy, Scikit-learn, Pandas, Matplotlib, NumPy, PyCharm, Matlab, Git, Docker, Ubuntu, LaTeX

Nov 2016 – Mar 2020 **Research scientist at TissueGnostics GmbH, Austria**
Deep learning/machine learning methods for computer vision tasks such as segmentation, classification, and detection
Technical Environment: Python, Keras, Tensorflow, PyTorch, OpenCV, SciPy, Scikit-learn, Pandas, Matplotlib, NumPy, PyCharm, Matlab, MatConvNet, Git, Ubuntu, LaTeX

Computer Skills

Computer Programming languages

- Python, C

Related software/tools

- Matlab, PyCharm, LaTeX, Git, Docker

Deep Learning Frameworks

- Keras, TensorFlow, PyTorch, MONAI, MatConvNet

Operating Systems

- Windows and Linux (Ubuntu)

Publications

Link to Google Scholar (citations: 2500+, h-index:18)

Journal Papers:

- **Mahbod A**, Saeidi N, Hatamikia S, Woitek R, *Evaluating Pre-trained Convolutional Neural Networks and Foundation Models as Feature Extractors for Content-based Medical Image Retrieval*, Engineering Applications of Artificial Intelligence, March 2025 **(Link)**
- **Mahbod A**, Polak C, Feldmann K, Khan R, Gelles K, Dorffner G, Woitek R, Hatamikia S, Ellinger I, *NuInsSeg: A Fully Annotated Dataset for Nuclei Instance Segmentation in H&E-Stained Histological Images*, Nature Scientific Data, March 2024 **(Link)**
- **Mahbod A**, Wang C, Ellinger I, Galdran A, Gopalakrishnan S, Niezgoda J, Yu Z, *FUSeg: The Foot Ulcer Segmentation Challenge*, Information, March 2024 **(Link)**
- **Mahbod A**, Dorffner G, Ellinger I, Woitek R, Hatamikia S, *Improving Generalization Capability of Deep Learning-Based Nuclei Instance Segmentation by Non-deterministic Train Time and Deterministic Test Time Stain Normalization*, Computational and Structural Biotechnology Journal, January 2024 **(Link)**
- Hatamikia S, George G, Schwarzhans F, **Mahbod A**, Woitek R, *Breast MRI radiomics and machine learning radiomics-based predictions of response to neoadjuvant chemotherapy–how are they affected by variations in tumour delineation?*, Computational and Structural Biotechnology, January 2024 **(Link)**
- **Mahbod A**, Schaefer G, Dorffner G, Ecker R, Ellinger I, *A Dual Decoder U-Net-Based Model for Nuclei Instance Segmentation in Hematoxylin and Eosin-Stained Histological Images*, Frontiers in Medicine, November 2022 **(Link)**
- Verma R, . . . , **Mahbod A**, . . . , Sethi A, *MoNuSAC2020: A Multi-organ Nuclei Segmentation and Classification Challenge*, IEEE Transactions on Medical Imaging, June 2021 **(Link)**
- **Mahbod A**, Schaefer G, Löw C, Dorffner G, Ecker R, Ellinger I, *Investigating the impact of bit depth of fluorescence-stained images on the performance of deep learning-based nuclei instance segmentation*, Diagnostics, May 2021 **(Link)**
- **Mahbod A**, Schaefer G, Bancher B, LÖw C, Dorffner G, Ecker R, Ellinger I, *CryoNuSeg: A Dataset for Nuclei Instance Segmentation of Cryosectioned H&E-Stained Histological Images*, Computers in Biology and Medicine, March 2021 **(Link)**
- **Mahbod A**, Tschandl P, Langs G, Ecker R, Ellinger I, *The Effects of Skin Lesion Segmentation on the Performance of Dermatoscopic Image Classification*, Computer Methods and Programs in Biomedicine, August 2020 **(Link)**
- **Mahbod A**, Schaefer G, Wang C, Ecker R, Dorffner G, Ellinger I, *Transfer Learning Using a Multi-Scale and Multi-Network Ensemble for Skin Lesion Classification*, Computer Methods and Programs in Biomedicine, March 2020 **(Link)**
- Kumar N, . . . , **Mahbod A**, . . . , Sethi A, *A Multi-Organ Nucleus Segmentation Challenge*, IEEE Transactions on Medical Imaging, October 2019 **(Link)**

- **Mahbod A**, Schaefer G, Ellinger I, Ecker R, Pitiot A, Wang C, *Fusing Fine-tuned Deep Features for Skin Lesion Classification*, Computerized Medical Imaging and Graphics, January 2019 **(Link)**
- Commowick O, ..., **Mahbod A**, . . . , Barillot C, *Objective Evaluation of Multiple Sclerosis Lesion Segmentation using a Data Management and Processing Infrastructure*, Nature Scientific Reports, September 2018 **(Link)**
- **Mahbod A**, Chowdhury M, Smedby Ö, Wang C, *Automatic brain segmentation using artificial neural networks with shape context*, Pattern Recognition Letters. January 2018 **(Link)**

Peer-reviewed Conference Papers:

- **Mahbod A**, Entezari R, Saukh O, Ellinger I, *Deep Neural Network Pruning for Nuclei Instance Segmentation in Hematoxylin & Eosin-Stained Histological Images*, MICCAI workshop on Applications of Medical Artificial Intelligence, September 2022 **(Link)**
- **Mahbod A**, Ecker R, Ellinger I, *Automatic Foot Ulcer Segmentation Using an Ensemble of Convolutional Neural Networks*, International Conference on Pattern Recognition (ICPR), August 2022 **(Link)**
- Bancher B, **Mahbod A**, Ellinger I, Ecker R, Dorffner G, *Improving Mask R-CNN for Nuclei Instance Segmentation in Hematoxylin & Eosin-Stained Histological Images*, MICCAI workshop on Computational Pathology, September 2021 **(Link)**
- **Mahbod A**, Schaefer G, Wang C, Ecker R, Dorffner G and Ellinger I, *Investigating and Exploiting Image Resolution for Transfer Learning-based Skin Lesion Classification*, IEEE International Conference on Pattern Recognition (ICPR). March 2021 **(Link)**
- **Mahbod A**, Schaefer G, Ecker R, Ellinger I, *Pollen Grain Microscopic Image Classification Using an Ensemble of Fine-Tuned Deep Convolutional Neural Networks*, ICPR workshop on Artificial Intelligence for Healthcare Applications. March 2021 **(Link)**
- **Mahbod A**, Schaefer G, Wang C, Ecker R, and Ellinger I, *Skin Lesion Classification Using Hybrid Deep Neural Networks*, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP). May 2019 **(Link)**
- **Mahbod A**, G Schaefer, Ellinger I, Ecker R, Smedby Ö, Wang C, *A Two-Stage U-Net Algorithm for Segmentation of Nuclei in H&E-Stained Tissues*, European Congress on Digital Pathology (ECDP). January 2019 **(Link)**
- **Mahbod A**, Ellinger I, Ecker R, Smedby Ö, Wang C, *Breast Cancer Histological Image Classification Using Fine-Tuned Deep Network Fusion*, International Conference Image Analysis and Recognition (ICIAR). June 2018 **(Link)**
- **Mahbod A**, Wang C, Smedby Ö, *Automatic Multiple Sclerosis Lesion Segmentation Using Hybrid Artificial Neural Networks*, MSSEG Challenge Proceedings at MICCAI Conference. October 2016 **(Link)**

Preprints/In submission:

- Dwivedi K, **Mahbod A**, Ecker R, Janjić K, *A Fusion-Based Multiomics Classification Approach for Enhanced Gene Discovery in Non-Small Cell Lung Cancer*, April 2025 **(Preprint Link)**
- Torbati N, Meshcheryakova A, Mechtcheriakova D, **Mahbod A**, *A Multi-Stage Auto-Context Deep Learning Framework for Tissue and Nuclei Segmentation and Classification in H&E-Stained Histological Images of Advanced Melanoma*, March 2025 **(Preprint Link)**
- Saeidi N, Karshenas H, Shoushtarian B, Hatamikia S, Woitek R, **Mahbod A**, *Leveraging Medical Foundation Model Features in Graph Neural Network-Based Retrieval of Breast Histopathology Images*, December 2024 **(Preprint Link)**
- Handa P, Dhir M, **Mahbod A**, Schwarzhans F, Woitek R, Goel N, Gunjan D, *WCEbleedGen: A wireless capsule endoscopy dataset and its benchmarking for automatic bleeding classification, detection, and segmentation* , Aug 2024 **(Preprint Link)**
- Handa P, **Mahbod A**, Schwarzhans F, Woitek R, Goel N, Chhabra D, Jha S, Dhir M, Gunjan D, Kakarla J, Raman B, *Capsule Vision 2024 Challenge: Multi-Class Abnormality Classification for Video Capsule Endoscopy* , Aug 2024 **(Preprint Link)**

Grants

2024 – 2026 WWTF grant (No. LS23-006), "LymphoidStructureMiner: AI-based exploration of the immunological contexture of lymphoid structures in translational research", Role: Co-Principal Investigator, Amount: €480,000

2022 – 2025 Bridge FFG grant (No. 895420), "Development of a deep learning-based decision support system for classification of oral dysplasia grades", Role: Project Collaborator, Amount: €360,000

2024 – 2025 Ernst Mach Grant from OeAD (No. MPC-2024-01396), "Histopathological Image Classification by Nuclei-based Graph Convolutional Network", Role: Supervisor, 9-month scholarship

2023 – 2024 Ernst Mach Grant from OeAD (No. MPC-2023-00569), "Image retrieval and classification in radiological images using graph neural networks", Role: Supervisor, 9-month scholarship

2020– 2022 Bridge Young Scientists FFG grant (No. 872636), "Deep learning for improved nuclei segmentation and knowledge transfer methods in microscopic images", Role: Postdoc Fellow, Amount: €227,000

Honors & Awards & Mini Grants

- **Ranked 1st and 2nd** in Track 1 and Track 2 of the "Panoptic segmentation of nuclei and tissue in advanced melanoma" challenge, March 2025
- **Ranked among** the top 2.66% across all fields, top 3.87% in computer science, and top 0.12% in the skin condition specialty, according to ScholarGPS ranks over the past 5 years, March 2025

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- **Travel Grant** to participate in the ICML conference, MDPI, Basel, June 2024
- **Ranked 1st** in the MICCAI 2021 Foot Ulcer Segmentation Challenge, August 2021

- **FFG Talente**: Praktika für Schülerinnen und Schüler (student internship grant), Role: Supervisor, 2021
- **Ranked 1st** in the MoNuSAC post-challenge and Ranked 2nd considering all phases for multi-organ nuclei segmentation and classification in H&E-stained histological images, June 2020
- **FFG Talente**: Praktika für Schülerinnen und Schüler (student internship grant), Role: Supervisor, 2020
- **Ranked 2nd** in the ISIC 2018 challenge online leaderboard (Task3: Lesion diagnosis) for dermoscopic skin lesion classification, January 2020 (Accessed on 2020-05)
- **Awarded Grant** from the Kaggle Open Data Research, January 2020
- **Ranked among top 5** for the Austrian Science2Business Award for the project entitled "Development of deep learning-based algorithms for automated histological image classification, detection and segmentation for digital pathology and medical research" (I. Ellinger, A. Mahbod, Rupert Ecker, and G. Dorffner), September 2019
- **Postgrad Congress Scholarship (Travel Grant)**, Medical University of Vienna, April 2019
- **Ranked 14th** in Kaggle data science competition in identifying metastatic tissue in histopathologic scans of lymph node sections among 1,157 teams, March 2019
- **NVIDIA GPU Grant**, granted a Titan V GPU to support our research at Medical University of Vienna, January 2019
- **Ranked 10th** in the MICCAI 2018 Multi-Organ Nuclei Segmentation Challenge (MoNuSeg) among 37 teams, August 2018
- **Postgrad Congress Scholarship (Travel Grant)**, Medical University of Vienna, March 2018
- **Marie Sklodowska-Curie Scholarship holder** as an Early Stage Researcher (ESR) in the CaSR Biomedicine Project (Horizon 2020), 2016 to 2019
- **Ranked 6th** (total) and **Ranked 2nd** (brain segmentation) in the open MICCAI Grand Challenge on MR Brain Image Segmentation (MRBrainS13), June 2016 (Assessed on 2016-06)
- **Holder of Tuition Fee Waiver Scholarship** for Master Program in Medical Engineering at KTH Royal Institute of Technology (cover 290.000SEK tuition fee for the master's degree), 2014 to 2016
- **Ranked 3rd** (on the basis of total GPA) among M.Sc. students of biomedical engineering (Iran University of Science and Technology), 2012
- **Honored & selected patent** of Iran's National Elites Foundation (INEF) Fair for Designing Round Fruits Automatic Categorizing Machine, South Khorasan, Iran, November 2011
- **Ranked 563rd** among more than 500,000 Mathematics and Physics participants in national university entrance exam, 2004

Patents

- **Mahbod A** and Behnam H, "Design & Implementation of device to determine the quality of fruits by ultrasonic waves", January 2012, Patent Certificate Number 73346 (Registered on State Deeds & Real Properties Organization, Iran)
- **Mahbod A**, Lak Aliabadi S and Ghanbari M, "Round Fruits Automatic Categorizing Machine", August 2011, Patent Certificate Number 70911, (Registered on State Deeds & Real Properties Organization, Iran)

- **Mahbod A**, "Design & Implementation of the Automatic Regulatory System of Car's Headlight", July 2011, Patent Certificate Number 70893, (Registered on State Deeds & Real Properties Organization, Iran)

Supervision

Sep 2024 – Sep 2026 **Main supervisor**, Postdoc (Nima Torbati), Danube Private University, Title: "LymphoidStructureMiner: AI-based exploration of the immunological contexture of lymphoid structures in translational research "

Sep 2024 – Sep 2026 **Co technical supervisor**, Postdoc (Kountay Dwivedi), Medical University of Vienna, Title: "Development of a deep learning-based decision support system for classification of oral dysplasia grades"

Oct 2024 – Oct 2027 **Co technical supervisor**, PhD student (Carmen Colin), Medical University of Vienna, Title: "Development of a highly innovative label-free & deep-learning based analysis method: Histoplasmonic Tissue Cytometry"

Dec 2024 – Aug 2025 **Main supervisor**, PhD visiting student (Nematollah Saeidi), Danube Private University, Title: "Histopathological Image Classification by Nuclei-based Graph Convolutional Network"

Sep 2023 – Sep 2024 **Co technical supervisor**, Master Thesis (Bianca Flatschart), University of Applied Sciences Krems, Title: "Quantitative comparison of automated and manual segmentations of breast cancer on MRI"

Sep 2023 – May 2024 **Main supervisor**, PhD visiting student (Nematollah Saeidi), Danube Private University, Title: "Image retrieval and classification in medical images using graph neural networks"

Feb 2022 – Mar 2023 **Main supervisor**, Master Thesis (Marcel Koseler), Medical University of Vienna, Title: "Improving Generalisation Capability of Deep Learning-Based Nuclei Instance Segmentation Model"

Mar 2020 – Jan 2022 **Main supervisor**, Master Thesis (Benjamin Bancher), Medical University of Vienna, Title: "Nuclei Segmentation using improved Mask-RCNN"

Teaching

- Scientific Module (WS 2024, SS and WS 2023 and WS 2022 at DPU)
- Creative und Critical Journal Club (SS and WS 2024, SS and WS 2023, SS and WS 2022, SS and WS 2021 at MedUni Wien)
- Diplomand Innen Seminar (SS 2023, WS 2022, SS 2021, and SS 2020 at MedUni Wien)

Certificates

- Research, Innovation Entrepreneurship (Novartis, Basel, Switzerland, Jan 2019)
- Management Systems and Internal Auditor Training (Andrew Hollo-Tas, Jan 2019)
- Self-presentation & Communication (BioTalentum, GÖdÖllő, Hungary, May 2018)
- Introduction to Academic Teaching (The University of Manchester, Manchester, UK, Sep 2017)
- Translational Drug Research (University of Copenhagen, Copenhagen, Denmark, May 2017)
- CaSR: Molecular and Clinical Aspects (University of Oxford, Oxford, UK, Dec 2016)
- Course certificates are available on **LinkedIn** in the "Licenses & Certifications" section.

Outreach Activities

- Presneter at the The Long Night of Research, Wiener Neustadt, Austria, May 2024 **(Link)**
- Trainer at the European Researchers' Night, Vienna, Austria, May 2022 **(Link)**
- Trainer at the European Researchers' Night, Vienna, Austria, September 2018 **(Link)**
- Workshop trainer at the Children University, Medical University Vienna "What is Gyro Gearloose doing? How scientists do research." July 2018 **(Link)**
- Workshop trainer at the Children University, Medical University Vienna "What is Gyro Gearloose doing? How scientists do research." July 2017 **(Link)**

Languages

- Farsi (Native)
- English (Fluent) – TOEFL iBT Test Score:101 (2013)
- German (Intermediate) – official ÖIF B2 certificate (2023)

Scientific Editor

- Editorial Board Member of Nature Scientific Data Journal (Since January 2025) **(Link)**
- Guest editor of Bioengineering Journal (Special Issue: Machine Learning-Aided Medical Image Analysis, April 2024 - June 2025) **(Link)**
- Guest editor of Diagnostics Journal (Special Issue: Advances in Computer-Aided Segmentation, Detection, and Classification of Nuclei in Histological Images, February 2022 - November 2022) **(Link)**
- Guest editor of Diagnostics Journal (Special Issue: Advances in Skin Lesion Image Analysis Using Machine Learning Approaches, October 2020 - January 2022) **(Link)**

Scientific Reviewer

Grant

- European Research Council (ERC) Starting Grant

Journals (selected)

- Medical Image Analysis
- IEEE Transaction on Medical Imaging
- Information Fusion
- IEEE Journal of Biomedical and Health Informatics
- Expert Systems with Applications
- Nature Scientific Data
- GigaScience
- Computer Methods and Programs in Biomedicine
- Artificial Intelligence in Medicine
- Engineering Applications of Artificial Intelligence

Conferences (selected)

- ISBI 2023
- ISIC Skin Image Analysis Workshop at ECCV 2022
- MIDL 2022

- MICCAI 2021
- ISIC Skin Image Analysis Workshop at CVPR 2021
- MIDL 2021
- MICCAI 2020
- ISIC Skin Image Analysis Workshop at CVPR 2020

Membership

- Marie Curie Alumni Association
- Digital Pathology Association
- Medical Image Computing and Computer Assisted Interventions
- Medical Imaging Cluster (MIC) at the Medical University of Vienna

References

- Associate Professor Dr. Isabella Ellinger (isabella.ellinger@meduniwien.ac.at)
  Institute for Pathophysiology and Allergy Research
  Medical University of Vienna, Vienna, Austria
- Dr. Chunliang Wang (Docent) (chunliang.wang@sth.kth.se)
  Division of Biomedical Imaging
  KTH Royal Institute of Technology, Stockholm, Sweden