Moein Heidari

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Education

- **The University of British Columbia (UBC)** — Vancouver, BC, Canada
  Ph.D. – Biomedical Engineering — *Jan 2024 – 2028*
  Thesis: Towards Complete AI-Enabled Echocardiography Interpretation with a Unified Multimodal Framework
  Supervisor: Dr. Ilker Hacihaliloglu

- **Iran University of Science and Technology (IUST)** — Tehran, Iran
  M.Sc. – Communication Systems; GPA: 4.0 (18.48/20) — *Oct 2021 – Nov 2023*
  Thesis: Fully Transformer-based End-to-End Communication System (Mark: Very Good)
  Supervisor: Dr. Shahrokh Farahmand

- **Iran University of Science and Technology (IUST)** — Tehran, Iran
  B.Sc. – Electrical Eng. – Communications; GPA: 3.6 (17.11/20) — *Sep 2017 – Sep 2021*
  Thesis: Deep Learning Based End-to-End Wireless Communication System With Conditional GAN as Unknown Channel (19.5/20)
  Supervisor: Dr. Shahrokh Farahmand

Publications

[1] †M. Heidari, Y. Medghalchi, M. Khoursha, R. Rezaeian, I. Hacihaliloglu, "WaRA: Wavelet Low Rank Adaptation," Submitted to MICCAI 2026, arXiv, GitHub.

[2] †M. Heidari, A. Bozorgpour, A. Zarif-Fakharnia, D. Merhof, I. Hacihaliloglu, "Echo-E^3Net: Efficient Endo-Epi Spatio-Temporal Network for Ejection Fraction Estimation," Submitted to UMB Journal, arXiv, GitHub.

[3] †M. Heidari, E. Khodapanah Aghdam, A. Manzella, D. Hsu, R. Scalabrino, W. Chen, D. J. Foran, I. Hacihaliloglu, "A Study on the Performance of U-Net Modifications in Retroperitoneal Tumor Segmentation," Accepted to SPIE 2025, arXiv, GitHub.

[4] Y. Medghalchi, M. Heidari, C. Allard, L. Sigal, I. Hacihaliloglu, "Prompt2Perturb (P2P): Text-Guided Diffusion-Based Adversarial Attacks on Breast Ultrasound Images," Accepted to **CVPR 2025**, arXiv, GitHub.

[5] †M. Heidari, R. Rezaeian, R. Azad, D. Merhof, H. Soltanian-Zadeh, I. Hacihaliloglu, "SL^2A-INR: Single-Layer Learnable Activation for Implicit Neural Representation," Accepted to **ICCV 2025**, arXiv, GitHub.

[6] A. Mehrabian, P. Mojarad Adi, M. Heidari, I. Hacihaliloglu, "Implicit Neural Representations with Fourier Kolmogorov-Arnold Networks," Accepted to ICASSP 2025, arXiv, GitHub.

[7] S. Ghorbani Kolahi, S. K. Chaharsooghi, T. Khatibi, A. Bozorgpour, R. Azad, M. Heidari, I. Hacihaliloglu, D. Merhof, "MSA^2Net: Multi-scale Adaptive Attention-guided Network for Medical Image Segmentation," BMVC 2024, arXiv, GitHub.

[8] †M. Heidari, S. Ghorbani Kolahi, S. Karimijafarbigloo, B. Azad, A. Bozorgpour, S. Hatami, R. Azad, A. Diba, U. Bagci, D. Merhof, "Computation-Efficient Era: A Comprehensive Survey of State Space Models in Medical Image Analysis," Submitted to Medical Image Analysis, arXiv, GitHub.

[9] †M. Heidari, R. Azad, S. Ghorbani Kolahi, R. Arimond, L. Niggemeier, A. Sulaiman, A. Bozorgpour, E. Khodapanah Aghdam, A. Kazerouni, I. Hacihaliloglu, D. Merhof, "Enhancing Efficiency in Vision Transformer Networks: Design Techniques and Insights," Published on arXiv, arXiv, GitHub.

[10] P. Ashrafian, M. Yazdani, M. Heidari, D. Shahriari, I. Hacihaliloglu, "Vision-Language Synthetic Data Enhances Echocardiography Downstream Tasks," Published on arXiv, arXiv, GitHub.

[11] R. Azad, M. Heidari, K. Yilmaz, M. Hüttemann, S. Karimijafarbigloo, Y. Wu, A. Schmeink, D. Merhof, "Loss Functions in the Era of Semantic Segmentation: A Survey and Outlook," Published on arXiv, arXiv, GitHub.

[12] M. Fiaz, †M. Heidari, R. M. Anwer, H. Cholakkal, "SA2-Net: Scale-aware Attention Network for Cell Segmentation and Beyond," **Oral**, BMVC 2023, arXiv, GitHub.

[13] †M. Heidari, A. Morsali, S. Heydarian, T. Abedini, "DiffGANPaint: Fast Inpainting Using Denoising Diffusion GANs," Invited to archive in ICLR 2023 TinyPapers, Paper.

[14] A. Morsali, M. Heidari, S. Heydarian, T. Abedini, "MLP-Attention: Improving Transformer Architecture with MLP Attention Weights," Invited to archive in ICLR 2023 TinyPapers, Paper, GitHub.

[15] R. Azad, A. Kazerouni, M. Heidari, E. Khodapanah Aghdam, A. Molaei, Y. Jia, A. Jose, R. Roy, D. Merhof, "Advances in Medical Image Analysis with Vision Transformers: A Comprehensive Review," Medical Image Analysis, arXiv, GitHub.

[16] A. Kazerouni, E. Khodapanah Aghdam, M. Heidari, R. Azad, M. Fayyaz, I. Hacihaliloglu, D. Merhof, "Diffusion Models for Medical Image Analysis: A Comprehensive Survey," Medical Image Analysis, arXiv, GitHub.

[17] †M. Heidari, A. Kazerouni, M. Soltany, R. Azad, E. Khodapanah Aghdam, J. Cohen-Adad, D. Merhof, "HiFormer: Hierarchical Multi-scale Representations Using Transformers for Medical Image Segmentation," WACV 2023, arXiv, GitHub.

[18] R. Azad, M. Heidari, Y. Wu, D. Merhof, "Contextual Attention Network: Transformer Meets U-Net," MICCAI 2022, arXiv, GitHub.

[19] R. Azad, M. Heidari, J. Cohen-Adad, E. Adeli, D. Merhof, "Intervertebral Disc Labeling With Learning Shape Information, A Look Once Approach," MICCAI 2022, arXiv, GitHub.

[20] R. Azad, M. Heidari, M. Shariatnia, E. Khodapanah Aghdam, S. Karimijafarbigloo, E. Adeli, D. Merhof, "TransDeepLab: Convolution-Free Transformer-based DeepLab v3+ for Medical Image Segmentation," MICCAI 2022, arXiv, GitHub.

[21] R. Azad, M. T. AL-Antary, M. Heidari, D. Merhof, "TransNorm: Transformer Provides a Strong Spatial Normalization Mechanism for a Deep Segmentation Model," IEEE Access, arXiv, GitHub.

† *First / co-first author*

Research Interests

Artificial Intelligence · Computer Vision · Deep Learning · GANs · Machine Learning · 3D Vision · Medical Image Analysis · Object Recognition · Implicit Neural Representations

Skills Summary

- **Languages**: Python, MATLAB, C/C++, SQL, Julia
- **Frameworks**: PyTorch, TensorFlow, Keras, Flux, OpenCV, NumPy, Pandas, Matplotlib
- **Tools**: Linux, LaTeX, Git, MySQL
- **Soft Skills**: Leadership, Event Management, Writing, Public Speaking, Time Management

Research Experience

- **Mohamed bin Zayed University of Artificial Intelligence** — Remote
  Research Assistant (Supervisor: Dr. Hisham Cholakkal) — *Jan 2023 – May 2023*
  - **Attention Mechanisms**: Research on attention mechanisms for microscopic medical image segmentation, resulting in 1 conference publication.
- **RWTH Aachen University** — Remote
  Research Assistant (Supervisors: Prof. Dorit Merhof and Reza Azad) — *Oct 2021 – Dec 2023*
  - **Transformer Models**: Research on Transformer models resulting in 4 conference and 3 journal papers.
  - **Intervertebral Disc Labeling**: Segmentation of intervertebral discs from medical images, resulting in 1 conference publication.
- **Iran University of Science and Technology (Dept. of CS)** — Tehran, Iran
  Research Assistant (Supervisor: Dr. Mohammad Reza Mohammadi) — *Apr 2021 – Jul 2021*
  - **Self-Supervised Object Detection**: Trained RetinaNet with various self-supervised pretraining methods (MOCO, PIRL, etc.) for object detection with low supervision.
- **DGSculptor, Montreal, Canada** — Remote
  Machine Learning and Computer Vision Researcher — *Dec 2021 – Dec 2023*
  - **Generative Flow Networks**: Research on various generative models and their statistical perspective, resulting in 2 conference publications.

Teaching Assistant Experience

- **DSCI_V 430 – Fairness, Accountability, Transparency and Ethics (FATE) in DS** — UBC, Canada
  Teaching Assistant — *Winter 2025 (2025W2)*
- **CPSC 330 – Applied Machine Learning** — UBC, Canada
  Teaching Assistant — *Winter 2024 (2024W2)*
- **DSCI 100 – Introduction to Data Science** — UBC, Canada
  Teaching Assistant — *Fall 2025 (2025W2)*
- **CPSC 340 – Machine Learning and Data Mining** — UBC, Canada
  Teaching Assistant — *Winter 2024 (2024W2)*
- **Signals and Systems Analysis** — IUST, Iran
  Teaching Assistant — *Spring 2021, Spring 2022, Spring 2023*
- **Fundamentals of Deep Learning** — IUST, Iran
  Teaching Assistant — *Spring 2022*

Working Experience

- **AI Engineer** — Tehran, Iran
  FaraAI (faraai.ir) — *May 2022 – Dec 2022*
  - **Responsibilities**: Designed and implemented computer vision pipelines for automatic detection and dispatching system for roadside emergencies, including fires and traffic incidents.

Professional Services

MICCAI	Reviewer, 2024, 2025, 2026 *(Rank 1 in AI for medical imaging)*
CVPR	Reviewer, 2025 *(Rank 1 in Computer Vision)*
ICCV	Reviewer, 2025 *(Rank 2 in Computer Vision)*
ICLR	Reviewer, 2024, 2025, 2026 *(Rank 1 in Machine Learning)*
BMVC	Reviewer, 2025, 2026
IEEE TMI	Journal Reviewer *(Top-tier journal in medical imaging)*
IEEE JBHI	Journal Reviewer *(Top-ranked journal for biomedical AI)*
IEEE Access	Journal Reviewer
IEEE Sys. J.	Journal Reviewer
IEEE SPL	Journal Reviewer

Relevant Course Grades

- Probability & Statistics: 19.25/20 (IUST)
- Digital Image Processing: 17.00/20 (IUST)
- Deep Learning: 20.0/20 (IUST)
- Advanced Data Mining: 20.0/20 (IUST)
- Cellular Communication: 19.25/20 (IUST)
- Engineering Mathematics: 20.0/20 (IUST)
- Reinforcement Learning: 20.0/20 (IUST)
- Random Processes: 19.25/20 (IUST)
- BMEG 591 – Topics in Biomed. Eng.: 92/100 (UBC)
- BMEG 581 – Prof. & Acad. Dev.: 100/100 (UBC)

Honors and Awards

- Ranked **3rd** among 25 Communications students, IUST, Iran – May 2021
- Ranked **9th** among 127 Electrical Engineering students, IUST, Iran – May 2021
- Ranked **1st** in the national Rahneshan competition for detecting inappropriate content in images/videos, INEF – Feb 2021
- Top 1% among ∼148,000 participants in the National University Entrance Exam, Iran – Summer 2017
- Received honorary master's admission from Iran University of Science and Technology – Sep 2021
- Top Student for 5 consecutive semesters at the Iran Languages Institute (ILI) – 2015–2016

Online Courses

- Convolutional Neural Networks, Coursera
- Structuring ML Projects, Coursera
- GANs Specialization, Coursera
- Neural Networks and Deep Learning, Coursera
- Sequence Models, Coursera
- Improving Deep NNs: Hyperparameter Tuning, Regularization & Optimization, Coursera

Languages

- IELTS (Academic): Listening 7.5, Reading 7, Speaking 7.5, Writing 6.5, **Overall: 7** – C1 Proficiency
- Persian: Native

References

Dr. Ilker Hacihaliloglu
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Prof. David J. Foran
Prof. of Pathology, Lab Medicine & Radiology
Rutgers Robert Wood Johnson Medical School
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Prof. Dorit Merhof
Prof., Informatics & Computer Science
University of Regensburg
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