

MOHAMMAD KHATERI, PH.D. CANDIDATE

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January 20, 2026

EDUCATION

University of Eastern Finland, Finland

2020–present

Ph.D. in Medical Computer Vision

Thesis: “Computational Methods for Brain Ultrastructure Analysis: Simulation, Super-Resolution, and Segmentation”; conducting multidisciplinary research in computational neuroscience, integrating computer science, neuroscience, and medical physics.

Harvard Medical School, USA

Dec 2024–Jun 2025

Visiting Scholar

Conducted research and developed AI-driven healthcare methods at Harvard Medical School and Boston Children’s Hospital in groups led by Prof. [Simon K. Warfield](#) and Prof. [P. Ellen Grant](#), focusing on MRI super-resolution and ultrasound image compounding for fetal brain analysis.

Tarbiat Modares University, Iran

2014–2017

Master of Science in Electrical Engineering–Communications

Thesis: Multi-sensor image fusion based on spatial-frequency features.

Bu-Ali Sina University, Iran

2009–2013

Bachelor of Science in Electrical Engineering–Electronics

Thesis: Examining electrical properties of concrete to analyze its physical properties.

RESEARCH PROJECTS

Weakly Supervised Learning for Ultrastructural Segmentation in Electron Microscopy

2024–present

University of Eastern Finland, Finland

Developing weakly supervised learning frameworks for soma instance segmentation in large-scale 3D electron microscopy images under severe annotation scarcity.

MRI Super-Resolution

2025–present

Harvard Medical School, USA

Developing deep learning methods for reconstructing high-resolution isotropic MRI from fast multi-view anisotropic acquisitions, addressing clinical constraints on scan time and spanning supervised, self-supervised, and scan-specific learning paradigms.

Computational Imaging for Ultrasound

2025–2026

Harvard Medical School, USA

Developed multi-view ultrasound compounding methods for fetal brain imaging to mitigate view-dependent artifacts and limited field of view, implementing and evaluating classical and learning-based strategies with a focus on unsupervised and self-supervised approaches, released as the USFetal Compounding Toolbox.

Image Restoration for Large-Scale Electron Microscopy

2022–2024

University of Eastern Finland, Finland

Developed supervised and self-supervised pipelines for in-place super-resolution and isotropic 3D reconstruction of large-scale electron microscopy images from anisotropic acquisitions, along with efficient denoising methods to enhance image quality.

Simulation of Diffusion MRI with Parallel Computing

2020–2022

University of Eastern Finland, Finland

Developed biophysically grounded Monte Carlo simulations of diffusion MRI using CUDA-based parallel computing, including simulations of advanced pulse sequences.

Multi-Sensor Image Fusion

2016–2019

Tarbiat Modares University, Iran; University of British Columbia, Canada

Developed model-based and learning-based pipelines for fusing MR–PET images and remote-sensing data (panchromatic, multispectral, and hyperspectral), leveraging multi-resolution analysis, compressed sensing, and sparse representations.

Image Quality Assessment

2016–2018

Tarbiat Modares University, Iran

Evaluated image sharpness and interpretability using Modulation Transfer Function analysis and task-driven quality metrics in medical and remote-sensing applications.

WORK EXPERIENCE

Tarbiat Modares University & University of British Columbia

2017–2019

Researcher – Conducted research on image processing and multi-sensor data fusion.

Huawei Technologies

2016–2017

RF Engineer – Focused on wireless communications quality assessment.

RESEARCH INTERESTS

Medical Image Processing and Analysis

Multi-Modal Machine Learning

Computer Vision

Computational Imaging

PROGRAMMING AND TECHNICAL SKILLS

Programming Languages: Python, C, C++, CUDA

Software and Libraries: MATLAB, L^AT_EX, PyTorch, scikit-learn, OpenCV, NumPy, SciPy, Matplotlib, Jupyter

AI & ML Architectures: Transformers (ViT, Swin), GANs, ANNs, CNNs, Vision Foundation Models

Computing & Infrastructure: Docker, Linux, HPC, GPU computing (NVIDIA, AMD), Git & GitHub

Medical Imaging & Visualization Tools: ITK-SNAP, 3D Slicer, Amira, MONAI

AWARDS AND HONORS

Best Paper Runner-Up, <i>EUVIP Workshop</i>	2023
Featured Cover Image in <i>NMR in Biomedicine</i>	2022
Oral Presentation at ISMRM (acceptance rate 12%)	2022
Top 1% Rank in National Entrance Exam for M.Sc.	2014
Outstanding Student Award (1st Rank) in B.Sc. in Electrical Engineering	2013

GRANTS

Doctoral Researcher Position (competitively awarded by UEF, salary-funded)	2022–2025
Finnish Cultural Foundation Grant (€15,000)	2025–2026
Finnish Foundation for Technology Promotion Grant (€13,200)	2025–2026
Saastamoinen Foundation Travel Grant (€12,000) [†]	2024–2025
KAUTE Foundation Grant (€5,700) [†]	2024–2025
DPMM Travel Grants (€1,000) [†]	2023
DPMM Travel Grants (€600)	2022

[†]Awarded to support a six-month research visit to Harvard Medical School and Boston Children's Hospital, 2024–2025.

SELECTED COURSES, WORKSHOPS, AND CONFERENCES

Deep Neural Networks and Computer Vision	2022
CUDA C/C++ Programming	2021
Pattern Recognition	2021
Workshop on Advanced MRI Methods, Finland	2022
International Society for Magnetic Resonance in Medicine (ISMRM), London, UK	2022
Medical Image Computing Summer School, University College London, UK	2022
European Workshop on Visual Information Processing (EUVIP), Gjøvik, Norway	2023
CITI Program: Human Subjects Research & HIPAA Training, Harvard Medical School, USA	2025

REVIEWER FOR ACADEMIC JOURNALS AND CONFERENCES

Journals: IEEE Transactions on Neural Networks and Learning Systems; IEEE Transactions on Image Processing; IEEE Transactions on Medical Imaging; IEEE Journal of Biomedical and Health Informatics; IEEE Journal of Selected Topics in Signal Processing; IEEE Signal Processing Letters; Pattern Recognition; Computers in Biology and Medicine; Engineering Applications of Artificial Intelligence; IET Image Processing Journal; The Journal of Supercomputing.

Conferences: IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR); International Conference on Pattern Recognition (ICPR)

LANGUAGES

English: Proficient

Persian: Native

MEMBERSHIPS

Student Member, Institute of Electrical and Electronics Engineers (IEEE)

Trainee Member, International Society for Magnetic Resonance in Medicine (ISMRM)

PUBLICATIONS

Author of fourteen journal and conference papers, as listed below; the complete list is available on my [Google Scholar](#).

Journal Articles

- **M. Khateri**, M. Ghahremani, Q. Zeng, R. Didier, A. Sierra, J. Tohka, P. E. Grant, and D. Karimi, “USFetal: Tools for Fetal Brain Ultrasound Compounding,” *IEEE Journal of Biomedical and Health Informatics* (submitted), 2026. [\[GitHub\]](#)
- **M. Khateri**, S. Vasylechko, M. Ghahremani, L. Timms, D. Kocanaogullari, S. K. Warfield, C. Jaimes, D. Karimi, A. Sierra, J. Tohka, S. Kurugol, and O. Afacan, “MRI Super-Resolution with Deep Learning: A Comprehensive Survey,” *Proceedings of the IEEE* (submitted), 2025. [\[GitHub\]](#)
- **M. Khateri**, M. Ghahremani, A. Sierra, and J. Tohka, “No-Clean-Reference Image Super-Resolution: Application to Electron Microscopy,” *IEEE Transactions on Computational Imaging*, 2024. [\[GitHub\]](#)
- M. Ghahremani, **M. Khateri**, A. Sierra, and J. Tohka, “Adversarial Distortion Learning for Medical Image Denoising,” *arXiv preprint*. [\[GitHub\]](#)
- **M. Khateri**, M. Reisert, A. Sierra, J. Tohka, and V. G. Kiselev, “What Does FEXI Measure?” *NMR in Biomedicine*, vol. 35, no. 12, e4804, 2022. [\(Featured on the cover of vol. 35, no. 12\)](#)
- **M. Khateri**, F. Shabanzade, F. Mirzapour, A. Zaji, and Z. Liu, “A Variational Approach for Fusion of Panchromatic and Multispectral Images Using a New Spatial–Spectral Consistency Term,” *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. 13, pp. 3421–3436, 2020.

- **M. Khateri**, F. Shabanzade, and F. Mirzapour, “Regularised IHS-Based Pan-Sharpening Approach Using Spectral Consistency Constraint and Total Variation,” *IET Image Processing*, vol. 14, no. 1, pp. 94–104, 2019.
- F. Shabanzade, **M. Khateri**, and Z. Liu, “MR and PET Image Fusion Using Nonparametric Bayesian Joint Dictionary Learning,” *IEEE Sensors Letters*, vol. 3, no. 7, pp. 1–4, 2019.

Under Preparation

- **M. Khateri**, M. Ghahremani, A. Sierra, and J. Tohka, “SomaSeg: Weakly-Supervised Learning for Soma Segmentation in Electron Microscopy,” *IEEE Transactions on Biomedical Engineering* (to be submitted February 2026).
- **M. Khateri**, D. Kocanaogullari, M. Ghahremani, A. Sierra, J. Tohka, S. K. Warfield, and O. Afacan, “MRI-SR: Supervised and Self-Supervised Learning for Multi-View MRI Super-Resolution,” *IEEE Signal Processing Letters* (to be submitted April 2026).
- D. Karimi, B. Li, **M. Khateri**, S. Valencia, A. Taymourtash, C. Jaimes, S. Warfield, E. Grant, “Enhancing Fetal Brain Diffusion MRI by Learning to Remove Synthesized Distortions,” *Medical Image Analysis* (to be submitted).

Conference Proceedings

- M. Ghahremani, **M. Khateri**, B. Jian, B. Wiestler, E. Adeli, and C. Wachinger, “H-ViT: A Hierarchical Vision Transformer for Deformable Image Registration,” *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2024. ([Highlights](#))
- **M. Khateri**, M. Ghahremani, A. Sierra, and J. Tohka, “Self-Supervised Super-Resolution Approach for Isotropic Reconstruction of Three-Dimensional Electron Microscopy Images from Anisotropic Acquisition,” *11th European Workshop on Visual Information Processing (EUVIP)*, 2023. ([Oral](#), [Best Paper Runner-Up](#))
- **M. Khateri**, M. Reisert, A. Sierra, J. Tohka, and V. G. Kiselev, “What Does FEXI Measure?” *International Society for Magnetic Resonance in Medicine (ISMRM)*, London, UK, 2022. ([Oral](#))
- **M. Khateri**, H. Ghassemian, and F. Mirzapour, “A Model-Based Method for Pan-Sharpening of Multi-Spectral Images Using Sparse Representation,” *IEEE International Conference on Signal and Image Processing Applications (ICSIPA)*, pp. 219–224, 2019. ([Oral](#))
- **M. Khateri** and H. Ghassemian, “A Self-Learning Approach for Pan-Sharpening of Multispectral Images,” *IEEE International Conference on Signal and Image Processing Applications (ICSIPA)*, pp. 199–204, 2017. ([Oral](#))
- **M. Khateri** and H. Ghassemian, “A Compressed-Sensing-Based Approach for Remote Sensing Image Fusion,” *24th Iranian Conference on Electrical Engineering (ICEE)*, pp. 1809–1814, 2016. ([Oral](#))