Mo Shahdloo, PhD

Vicon Motion Systems,
6 Oxford Industrial Park,
Yarnton, Oxfordshire, OX5 1QU

shahdloo@gmail.com
moshahdloo.com
linkedin.com/in/shahdloo
github.com/shahdloo

Professional Experience

Industry

2022-present ***Machine Learning Computer Vision Scientist***, Vicon Motion Systems, Oxford, UK
Developing novel machine learning techniques for human motion analysis.

2014-14 ***Embedded Software Developer***, Farineh Tech, Tehran, Iran
Implementing industrial communication protocols using C++ on embedded Linux. The developed components became a key part of the distributed control system product, that have been in use in the South Pars gas refinery plants.

2013-14 ***Software Developer***, KAG inc., Tehran, Iran
Designing and implementing communication protocols using embedded C# on WinCE platform, that turned into a leading product in the national remote sensing market.

2011-13 ***Research Engineer*** Kerman Tablo, Tehran, Iran
Developing temperature sensor IO hardware modules, and the software implementation of their respective control algorithms in C++ and Assembly on embedded Linux, as well as the required kernel drivers to integrate the components into the distributed control system product. The developed products have been in use in multiple power plants.

Academia

Research

2020-23 ***Postdoctoral Researcher***, FMRIB Centre, University of Oxford
Developing novel physics and deep-learning based image reconstruction and analysis methods for accelerated MRI, involving extensive programming of the software tools and pulse sequences in Python and C++. Developing denoising methods for ultrahigh-field fMRI through low-rank signal processing. The resulting products are getting used by collaborators at Oxford and UC Berkeley universities, as well as getting published as a journal article and 4 conference papers.

2014-22 ***Graduate Researcher***, ICON Lab, Bilkent University
Developing accelerated MRI methods using compressed-sensing and deep-learning for multi-contrast MR image reconstruction and synthesis, using Matlab and Python. Alongside, investigating semantic representations in the human brain by designing experiments and statistical analysis to build predictive models from big-data brain recordings using Bayesian statistics, machine learning and NLP language models. Research outputs led to the PhD degree, as well as 6 journal articles and 7 conference publications.

Supervision and Teaching

2020-21 ***Co-supervisor***, EEE Department, Bilkent University
Co-supervision of students, through their thesis projects in using NLP models to map timescales of semantic representation of natural stories in the human brain.

2020-22 ***Tutor***, MRI Graduate Program, University of Oxford
Tutoring DPhil students on MR physics, through lectures and interactive tutorials.

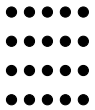
2021-22 ***Project Adviser***, Neuromatch Academy Summer School
Guiding groups of students in their projects during the summer school. The projects spanned multiple areas of neural data science, heavily depending on machine learning/deep learning and large-scale brain recordings.

2014-20 ***Teaching Assistant***, EE Department, Bilkent University
Tutoring multiple courses in electrical engineering, including linear algebra, probability, statistical analysis, computational neuroscience, electromagnetics, and biomedical instrumentation.

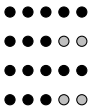
Skills

Tech stack

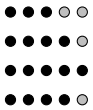
- C/C++
- Python
- Tensorflow/Pytorch
- Numpy/Scipy



- Scikit-learn
- Tableau
- Matlab
- R



- SQL
- FastAPI
- Docker
- AWS



Education

2017-20 **PhD in Electrical Engineering, *Neural Data Science and Medical Imaging***, Bilkent University, Ankara
Advisor: Prof. Tolga Çukur
Dissertation: *Optimization and Machine-Learning in MRI: Applications in Rapid MR Image Reconstruction and Encoding Models of Cortical Representations*

2014-16 **MSc in Electrical Engineering, *Neural Data Science and Medical Imaging***, Bilkent University, Ankara
Advisor: Prof. Tolga Çukur

2007-11 **BSc in Electrical Engineering, *Control Theory***, Amirkabir University of Technology, Tehran
Advisor: Prof. Behzad Samadi

Honors and Awards

2014-20 Full scholarship granted by Bilkent University, including tuition waiver and monthly stipend

2012 Ranked 28th among 100k participants in the Iranian national higher education examination

2006 Bronze medal in the Iranian National Physics Olympiad

Publications

Journal Articles

7. **Shahdloo M**, Çelik E, Urgen BA, Gallant JL, and Çukur T. Task-Dependent Warping of Semantic Representations During Search for Visual Action Categories. Journal of Neuroscience 2022;42:6782–99. DOI: 10.1523/jneurosci.1372-21.2022.

6. **Shahdloo M**, Schüffelgen U, Papp D, Miller K, and Chiew M. Model-based dynamic off-resonance correction for improved accelerated fMRI in awake behaving non-human primates. Magnetic Resonance in Medicine 2022;87:2922–32. DOI: 10.1002/mrm.29167.

5. Kiremitci I, Yilmaz O, Celik E, **Shahdloo M**, Huth AG, and Çukur T. Attentional Modulation of Hierarchical Speech Representations in a Multi-Talker Environment. Cerebral Cortex 2021;31:4986–5005. DOI: 10.1093/cercor/bhab136.

4. Dar SUH, Yurt M, **Shahdloo M**, Ildiz E, Tinaz B, and Çukur T. Prior-Guided Image Reconstruction for Accelerated Multi-Contrast MRI via Generative Adversarial Networks. IEEE Journal of Selected Topics in Signal Processing 2020;14:1072–87. DOI: 10.1109/JSTSP.2020.3001737.

3. **Shahdloo M**, Çelik E, and Çukur T. Biased Competition in Semantic Representation During Natural Visual Search. NeuroImage 2020;216:116383. DOI: 10.1016/j.neuroimage.2019.116383.

2. **Shahdloo M**, Ilicak E, Tofighi M, Saritas EU, Cetin AE, and Çukur T. Projection onto Epigraph Sets for Rapid Self-Tuning Compressed Sensing MRI. IEEE Transactions on Medical Imaging 2019;38:1677–89. DOI: 10.1109/TMI.2018.2885599.

1. Dar SUH, Yurt M, **Shahdloo M**, and Çukur T. Synergistic Reconstruction and Synthesis via Generative Adversarial Networks for Accelerated Multi-Contrast MRI. arxiv 2018. eprint: 1805.10704v1.

Conferences

11. **Shahdloo M** and Chiew M. Optimal Singular-Value Shrinkage for fMRI Denoising. In: *ISMRM*. London, 2022:4042.

10. **Shahdloo M**, Khalighinejad N, Harbison C, Miller K, Rushworth M, and Chiew M. Dynamic off-resonance correction improves functional data quality in fMRI of awake behaving NHPs. In: *OHBM*. Glasgow, 2022:1726.

9. Papp D, Schüffelgen U, **Shahdloo M**, Rieger SW, Hess AT, Rushworth M, and Clare S. Imaging Performance of a Multi-channel Non-human Primate Coil. In: *ISMRM*. Online, 2021:3224.

8. **Shahdloo M**, Papp D, Schüffelgen U, Miller K, Rushworth M, and Chiew M. Highly Accelerated fMRI of Awake Behaving Non-human Primates via Model-based Dynamic Off-resonance Correction. In: *ISMRM*. Online, 2021:257.

7. Dar SUH, Yurt M, **Shahdloo M**, and Çukur T. Joint Recovery of Variably Accelerated Multi-contrast MRI Acquisitions via Generative Adversarial Networks. In: *ISMRM*. Montreal, 2019:0666.

6. **Shahdloo M**, Acar M, and Çukur T. Attention During Story Listening Modulates Tempo-ral Receptive Windows Across Human Cortex. In: *CCN*. Berlin, 2019:PS–1A.52.

5. **Shahdloo M** and Çukur T. Trade-off Between Fat-suppression and Partial-voluming in Weighted Combination Alternating Repetition-time (ATR) Balanced SSFP. In: *ESMRMB*. Rotterdam, 2019:L06.09.

4. **Shahdloo M**, Ürgen B, Çelik E, and Çukur T. Attention to Action Categories Shifts Semantic Tuning Toward Targets Across the Brain. In: *OHBM*. Rome, 2019:T661.

3. **Shahdloo M**, Ilicak E, Tofighi M, Saritas EU, Cetin AE, and Çukur T. Rapid Self-tuning Compressed-sensing MRI Using Projection onto Epigraph Sets. In: *ISMRM*. Paris, 2018:0251.

2. **Shahdloo M** and Çukur T. Biased Competition in Semantic Representations During Category-based Visual Search. In: *OHBM*. Vancouver, 2017.

1. **Shahdloo M**, Ilicak E, Tofighi M, Saritas EU, Cetin AE, and Çukur T. Adaptive Wavelet Thresholding for Profile-Encoding Reconstruction of Balanced Steady-State Free Precession Acquisitions. In: *ESMRMB*. Barcelona, 2017.

Voluntary Service

- Committee Member, MRI Together Working Group, *ESMRMB*
- Co-chair, MRI Together 2022, *ESMRMB workshop on open science and reproducible MR research*

Society member
- International Society for MR in Medicine (ISMRM)
- European Society for MR in Medicine and Biology (ESMRMB)
- Organization for Human Brain Mapping (OHBM)

Editorial board & reviewing
- Frontiers in Neuroinformatics
- Aperture Neuro
- IEEE Transactions on Medical Imaging
- Signal, Image and Video Processing (SIVP)
- ISMRM annual meeting
- Conference on Cognitive Computational Neuroscience (CCN)