Mo Shahdloo, PhD

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Trained in Electrical Engineering with a strong mathematical background, and with extensive academic and industrial experience in delivering applied medical imaging research in the healthcare sector. I have years of experience programming in C++, Python, Matlab, and embedded systems, applied to MR methods development, computational neuroscience, deep learning, machine learning, data visualisation, data mining and statistical analyses.

Professional Experience

Academy

Research

2020- *Postdoctoral Researcher*, Physics Group, FMRIB, University of Oxford
Research on multiple aspects of the preclinical magnetic resonance imaging (MRI), by developing novel motion-corrected reconstruction and denoising methods for accelerated awake NHP fMRI, involving extensive programming of the reconstruction tools and pulse sequences in Python and C++. These developments have been practically adopted by teams at Oxford and MIT universities, as well as getting published as a journal article and 4 conference papers.

2014-20 *Graduate Researcher*, ICON Lab, Bilkent University
Developing reconstruction methods for compressed-sensing MRI, and also investigating human auditory, visual, and semantic systems under naturalistic experimental conditions using Bayesian statistics, machine learning and deep learning and coding in Matlab and Python. Research outputs led to the PhD degree, as well as 6 journal articles and 7 conference publications.

Teaching

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

2021-21 *Lead Project TA*, Neuromatch Academy Summer School
Guiding international students in their projects during the summer school. The projects spanned multiple areas of computational neuroscience, heavilly depending on machine learning/deep learning and large-scale brain recordings.

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

Industry

2014-14 *Hardware developer*, Farineh Fanavar, Tehran, Iran
Implemented industrial communication protocols using C++ on embedded Linux, as well as developing in-house embedded IO hardware modules. 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 *Senior software developer*, KAG inc., Tehran, Iran
Designed and implemented communication protocols on embedded WinCE platform, that turned into a leading product in the national remote sensing market.

2011-13 *RnD Engineer*, Kerman Tablo, Tehran, Iran
Developed temperature sensor IO hardware modules, and the software implementation of their respective control algorithms in C++ 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 in Iran.

Education

2017-20 PhD in Electrical and Electronics Engineering, Bilkent University, Ankara
Advisor: Tolga Çukur
Dissertation title: *Optimization and Machine-Learning in MRI: Applications in Rapid MR Image Reconstruction and Encoding Models of Cortical Representations*

2014-16 MSc in Electrical and Electronics Engineering, Bilkent University, Ankara
Advisor: Tolga Çukur

2007-11 BSc in Electrical Engineering, Amirkabir University of Technology, Tehran
Advisor: Behzad Samadi

Honors and Awards

2021 Endorsed by the UK Research and Innovation (UKRI), to be eligible for the Global Talent UK visa

2014-21 Full scholarship granted by Bilkent University, including tuition waiver and monthly stipend for six years during graduate studies

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

2006 Bronze medal in the Iranian National Physics Olympiad

Selected Publications

Journal Articles (5 out of 7)

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. doi: 10.1093/cercor/bhab136.

4. **Shahdloo M**, Çelik E, Urgen BA, Gallant JL, and Çukur T. Task-Dependent Warping of Semantic Representations During Search for Visual Action Categories. biorxiv 2021. doi: 10.1101/2021.06.17.448789.

3. 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.

2. **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.

1. **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.

Conferences (4 out of 11)

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

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

2. 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.

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

Skills

Technical stack

- Python ●●●●●
- Tensorflow/Pytorch ●●●●○
- Numpy/Scipy ●●●●●
- Scikit-learn ●●●●●
- Matlab ●●●●●
- R ●●●○○
- SQL ●●●○○
- C/C++/C# ●●●●○
- RTOS Linux ●●●●○

Languages

- English ●●●●●
- Persian ●●●●●
- Turkish ●●●●○

Community Service

Committee membership

- Co-organiser, MRI Together 2022, *Global ESMRMB-endorsed workshop on open science and reproducible MR research.*

Society membership

- 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
- OHBM Aperture
- IEEE Transactions on Medical Imaging
- Signal, Image and Video Processing (SIVP)
- ISMRM annual meeting
- Conference on Cognitive Computational Neuroscience (CCN)

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