Amir Buchali

M.Sc. In Electrical Engineering

Contact Information

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Education

BSc in Biomedical Engineering, Amirkabir University of Technology, Tehran, Iran

Date	2012 – 2017
Specialty	Bioelectrics
GPA	16.94/20 (3.65/4.00)
Last 2 years	17.95/20 (3.84/4.00)
Supervisor	Mehrdad Saviz
Thesis	Realistic three-dimensional shape modeling based on microscopic images of cells and organelles for computational bio-engineering

MSc in Electrical Engineering, Imam Khomeini International University, Qazvin, Iran

Date	2017 - 2021
Specialty	Control systems
GPA	17.29/20 (3.78/4.00)
Supervisor	Mohsen Davoudi
Thesis	Control of a 1-DOF manipulator using EEG signals

Publications

2026 A. Shamaei, **A. Buchali,** E. Niess, L. Hingerl, B. Strasser, A. Osburg, K. Eckstein, W. Bogner, S. Motyka, "PHIVE: A physics-informed variational encoder enables rapid spectral fitting of brain metabolite mapping at 7T", Medical Image Analysis, Volume 111, 2026, 104014, ISSN 1361-8415, https://doi.org/10.1016/j.media.2026.104014.

2025 **A. Buchali**, R. Souza, S. Motyka, E. Niess, B. Strasser, W. Bogner, and A. Shamaei, "Accelerating water removal in MRSI using domain knowledge-based deep learning," in Proc. 2025 IEEE 22nd Int. Symp. Biomed. Imaging (ISBI), 2025, pp. 1–4, doi: 10.1109/ISBI60581.2025.10980704.

2020 Naghikhani, A. Jodeiri, A. Karbassi, M. Baghdadi, A. Sarang, and **A. Buchali**, "Investigating the artificial intelligence methods for determining performance of the NZVI permeable reactive barriers," *Groundw. Sustain. Dev.*, vol. 12, no. June 2020, p. 100516, Feb. 2021, doi: 10.1016/j.gsd.2020.100516("Investigating the artificial intelligence methods for determining performance of the NZVI permeable reactive barriers," 2021)

2019 **A. Buchali**, E. Sharifi, M. Saviz. "A Novel Toolbox for Generating Realistic Biological Cell Geometries for Electromagnetic Microdosimetry". *AUT Journal of Electrical Engineering*, 2019, doi: 10.22060/eej.2019.16213.5282.

Work

AI Engineer – Massive Portrait
Jan 2025 – Present

As an AI Engineer at Massive Portrait, I am actively involved in developing a comprehensive machine learning course focused on computer graphics. My responsibilities include designing engaging coding projects and assignments, as well as structuring the learning progression across key sections, including Natural Language Processing (NLP), Computer Vision, and Reinforcement Learning (RL).

Skills

Languages	Native: Persian Fluent: English (Previous TOEFL iBT: **98**)
Programming Languages	Python (Expert), MATLAB (Expert), SQL (Intermediate), C/C++ (Intermediate)
Frameworks & Libraries	PyTorch, Scikit-learn, Pandas, NumPy, ...
Tools & Technologies	Git, Linux

Awards and Honors

2024	Awarded Best MRS Challenge at the ISMRM Workshop.
2017-2020	Ranked 1st among my fellow grad students.
2012-2017	Among top 10% students in B.Sc.
2012	Ranked 711 among 230,000 participants in the nationwide university entrance exam.

Selected Projects

MRSI Data

- A deep autoencoder for water peak removal of in-vivo MRSI data in an unsupervised manner [code].
- Semi-supervised metabolite quantification of simulated MRSI data [MRSI Fitting Challenge 2024].

EEG Data

- Development of an Auxiliary Classifier Generative Adversarial Network to generate synthetic EEG data and enhance motor imagery (MI) task classification [code].
- Comparison of EEG time-frequency transforms as a preprocessing stage for a deep learning-based pipeline, including Short-Time Fourier Transform, Wavelet Transform, Hilbert-Huang.

Other

- Benchmarking MIMIC-IV-ED dataset for emergency classification tasks using traditional ML methods.
- Developing RL-based recommender system based on offline dating app data.
- Utilizing DL for racism and xenophobia detection in text [code].
- Creating a deep feedforward neural network for water contaminant prediction.
- Implementing firefly algorithm for non-convex cost function optimization.

- References can be provided upon request.