Saeed **Rafieyan**

Digital Manufacturing of Biomimetic Systems Group, Polish Academy of Sciences, Warsaw, Poland

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Academic Background

Institute of Physical Chemistry, Polish Academy of Sciences (ICHF PAN) — *Warsaw, Poland*
PhD student, Digital Manufacturing of Biomimetic Systems Group — ***Jan 2026 – Present***

- Thesis: Inverse design-assisted biodegradable modular dressings for negative pressure wound healing.

Tarbiat Modares University, Faculty of Chemical Engineering — *Tehran, Iran*
Master of Science in Chemical Engineering - Biomedical Sciences — ***Sep 2018 – Feb 2022***

- Thesis: Predicting cell behavior on cardiac tissue engineering scaffolds using machine learning algorithms.
- Note: The extended duration of my master's program was due to delays caused by the COVID-19 pandemic and related lockdown measures.
- GPA: 3.78 / 4

Tafresh University, Faculty of Chemical Engineering — *Tafresh, Iran*
Bachelor of Science in Chemical Engineering — ***Sep 2013 – Sep 2017***

- Thesis: Simulation of the biodiesel production process with Aspen HYSYS.

Research Interests

Applications of AI in chemical and biochemical modeling, medical and healthcare, protein design using AI, drug discovery using AI, bioinformatics, medical imaging, personalized medicine, tissue engineering, chemical engineering.

Publications

Submitted to *Computers in Biology and Medicine* — **2025**
A fully integrated multi-tissue and machine learning online platform for scaffold design by 3D bioprinting
Rafieyan, S., Partovi-Nasr, M., Ansari, E., Kheradvar Kolour, A., Banimohamad-Shotorbani, B., & Vasheghani-Farahani, E.
DOI: pending

Submitted to *Bioresource Technology* — **2025**
Optimizing organosolv pretreatment through machine learning for efficient lignocellulose fractionation
Kargaran, E., Song, G., Shetu, N., **Rafieyan, S.**, Madadi, M., Hadiyanto, H., Sun, C., Sun, F., & Gupta, V.
DOI: pending

Bioresource Technology — **2025**
Data-driven insights for enhanced cellulose conversion to 5-hydroxymethylfurfural using machine learning
Qiao, Y., Kargaran, E., Ji, H., Madadi, M., **Rafieyan, S.**, & Liu, D.
DOI: 10.1016/j.biortech.2025.132582

Biofabrication — **2024**
A practical machine learning approach for predicting the quality of 3D bioprinted scaffolds
Rafieyan, S., Ansari, E., & Vasheghani-Farahani, E.
DOI: 10.1088/1758-5090/ad6374

Chemical Engineering Research and Design
Acetone, butanol, and ethanol fermentation products recovery, challenges and opportunities **2024**
Rafieyan, S., Boojari, M. A., Setayeshnia, A., Fakhroleslam, M., Sánchez-Ramírez, E., Bay, M. S., & Segovia-Hernández, J. G.
DOI: 10.1016/j.cherd.2024.04.021

Computers in Biology and Medicine
MLATE, machine learning for predicting cell behavior on cardiac tissue engineering scaffolds **2023**
Rafieyan, S., Vasheghani-Farahani, E., Baheiraei, N., & Keshavarz, H.
DOI: 10.1016/j.compbiomed.2023.106804

Polymers
A review of recent advances in natural polymer-based scaffolds for musculoskeletal tissue engineering **2022**
Fan, J., Abedi-Dorcheh, K., Sadat Vaziri, A., Kazemi-Aghdam, F., **Rafieyan, S.**, *et al.*
DOI: 10.3390/polym14102097

Skills

Computational:	
Machine Learning	Regression, classification, clustering, dimensionality reduction, feature engineering, model selection, hyperparameter tuning, cross-validation
Deep Learning	PyTorch, TensorFlow, Transformers, RNNs, CNNs, multimodal learning, generative models
Natural Language Processing	Text mining, topic modeling, sentiment analysis, LLM fine-tuning, Text Classification and clustering
Data Analysis & Visualization	NumPy, Pandas, scikit-learn, Matplotlib, Plotly, Seaborn, Dash
Databases	PostgreSQL, MySQL, SQLite, data warehousing principles
MLOps & Deployment	Model versioning, CI/CD, RESTful APIs, Flask, FastAPI, Docker, GitHub Actions
Experimental:	
Cell & Tissue Engineering	Cell culture, expansion, freezing/thawing, MTT assay
Biomaterial Fabrication	Decellularization, hydrogel preparation, scaffold fabrication, 3D printing, freeze-drying

Academic Experiences

Jiangnan University, Dr. Madadi's Group *Wuxi, China*
Research Assistant - Data Scientist *Jan 2025 – Present*

- Developed machine learning and deep learning–based predictive models for biofuel production and process optimization, resulting in multiple peer-reviewed publications.

Tarbiat Modares University, Dr. Fakhroleslam's Group *Tehran, Iran*
Research Assistant - Data Scientist *Sep 2023 – Dec 2025*

- Developed machine learning and deep learning–based predictive models for distillation and separation processes, and worked on chemical engineering text mining.

Prof. Vasheghani-Farahani's Group *Tehran, Iran*
Research Assistant - Data Scientist *Jan 2019 – Dec 2025*

- Developed and led multiple AI-driven research initiatives, including **MLATE**, a machine learning framework for scaffold prediction (3 versions, available at www.MLATE.ir), and **TissueGPT**, a domain-specific large language model fine-tuned on tissue engineering literature for scientific text understanding and generation (Model link)

Men's Health & Reproductive Health Research Centre (MHRHRC), Shohadaye Tajrish Hospital — *Tehran, Iran*

Data Scientist — *Aug 2022 – Jan 2024*

- Multimodal deep learning for semen analysis and drug effectiveness prediction using clinical data and semen imaging.

Licenses and Certificates

IOP Trusted Reviewer — *IOP Publishing*
Neural Networks and Deep Learning — *Coursera*
Data Visualization using Plotly — *Coursera*
Deep Learning with PyTorch, Image Segmentation — *Coursera*
Deep Learning with PyTorch, Object Localization — *Coursera*
Introduction to Genomic Technologies — *Coursera*
Python for Genomic Data Science — *Coursera*

Languages

English TOEFL iBT 90 out of 120 (R 23, L 25, S 21, W 21)
Persian Native

References

Prof. Ebrahim Vasheghani-Farahani — *evf@modares.ac.ir*
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Dr. Ahmad Bayat — *bayat@tafreshu.ac.ir*
Assistant Professor, Department of Chemical Engineering, Tafresh University — *+98 (86) 3624 1326*

Dr. Meysam Madadi (Sam) — *m.madadi@jiangnan.edu.cn*
Associate Professor, School of Bioengineering, Jiangnan University — *(+86) 15072300431*

Dr. Mohammad Fakhroleslam — *fakhroleslam@modares.ac.ir*
Assistant Professor, Department of Chemical Engineering, Tarbiat Modares University — *+98 (21) 8288 3314*