

Mehdi Yazdani-Jahromi

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Summary

AI research scientist and PhD in Computer Science specializing in representation learning, with primary applications in computational biology and drug discovery. Industry experience at Johnson & Johnson and Microsoft, where I developed language models for mRNA and machine learning systems for large-scale biomedical data. Strong programming background in Python, and JavaScript, with extensive experience in PyTorch, Transformers and graph neural networks. Published in NeurIPS, ICLR, and Briefings in Bioinformatics, with work spanning mRNA modeling, drug target interaction prediction and algorithmic fairness.

Research Experience

- DeepBio Scientific**, Senior Research Scientist – Orlando, FL Jan 2026 – present
- Lead computational biology and drug discovery research by developing machine learning models and algorithms to analyze complex biomedical data.
 - Collaborate with cross-functional teams to translate research findings into scalable bioinformatics and computational drug discovery workflows.
 - Design and implement a state-of-the-art agentic AI system for retrieval and multi-step reasoning across biomedical datasets, enabling faster and more accurate analysis.
 - Develop benchmark datasets, evaluation metrics, and testing frameworks to assess model retrieval, reasoning, and predictive performance.
- Microsoft**, Research Intern, Bio-LLMs – Redmond, WA June 2025 – Sept 2025
- Built a novel agent orchestration system for planning, tool use, and judgment.
 - Explored agentic AI using de-identified clinical datasets through end-to-end experiments and evaluation.
 - Developed a Retrieval-Augmented Generation (RAG) stack integrating hybrid dense and sparse search, reranking, and citation attribution.
 - Contributed to the development of evaluation metrics and benchmarks for agentic AI systems.
- Johnson & Johnson (Janssen R&D)**, Data Science Intern, AI/ML for Drug Discovery May 2024 – Nov 2024
- Developed and trained HELM (Hierarchical Encoding for mRNA Language Modeling), the first mRNA antibody language model, achieving up to an 8% increase in prediction accuracy and enabling the generation of more diverse and biologically plausible sequences.
 - Explored alternative to Attention architectures including Mamba and Hyena, to improve the efficiency and effectiveness of models processing mRNA sequences.
 - Implemented large-scale distributed training on Kubernetes, significantly reducing LLM training time on extensive datasets while improving resource utilization and scalability.
 - Collaborated with cross-functional teams to refine and deploy advanced LLM architectures, enhancing model accuracy and efficiency for large-scale data processing tasks.
- University of Central Florida**, Graduate Research Assistant – Orlando Aug 2021 – Dec 2025
- Developed Equi-mRNA (NeurIPS 2025), the first codon-level equivariant mRNA language model. It encodes synonymous-codon symmetries as $SO(2)$ cyclic subgroups. It improved accuracy by up to $\sim 10\%$ on expression, stability and riboswitch prediction, and generated mRNA sequences $\sim 4\times$ more realistic than the baseline.
 - Proposed FairBiNN (NeurIPS 2024), which balances fairness and accuracy as a Stackelberg game solved with bilevel optimization. Contributed to fair representation learning work (HCII 2023 and 2024, both orals).
 - Built interpretable drug–target interaction models based on 3D protein binding sites: AttentionSiteDTI (Briefings in Bioinformatics 2022, first author): 5 of 7 predictions were confirmed in SARS-CoV-2 binding-inhibition assays with experimental collaborators. BindingSite-AugmentedDTA (Briefings in Bioinformatics 2023) and FragXsiteDTI (RECOMB 2024, oral): co-first author on both.
 - Lead inventor on a patent application for Equi-mRNA, filed in September 2025 through the UCF Office of Technology Transfer.
 - Entrepreneurial Lead, NSF I-Corps (UCF, Fall 2025 Health cohort), team GeneAI Therapeutics, commercializing Equi-mRNA as an AI platform for designing mRNA therapeutics.
 - Won a \$30K Amazon Research Credit award (2023) and contributed technical content to NIH and NSF proposals.
 - Mentored undergraduate and junior graduate researchers in research methods, experimental design and software engineering. Guided lab members through projects that became co-authored papers: FragXsiteDTI, BoKDiff and two CSSSA 2023 papers.

Education

- Ph.D. University of Central Florida**, Ph.D. in Computer Science Jan 2021 – Oct 2025
- Thesis: Advancing Drug Discovery with Structural and Representation Learning of Biological Systems Link
 - GPA: 3.91/4.0
- M.S. University of Central Florida**, M.S. in Computer Science Jan 2021 – Aug 2023
- GPA: 3.9/4.0
- M.S. Sharif University of Technology**, M.S. in Industrial Engineering Sept 2017 – Dec 2019
- GPA: 3.88/4.0

Selected Publications

Equi-mRNA: Protein Translation Equivariant Encoding for mRNA Language Models Mehdi Yazdani-Jahromi , Ali Khodabandeh Yalabadi, Ozlem Ozmen Garibay 10.52202/085713-0904 (Advances in Neural Information Processing Systems 38)	Jan 2025
HELM: Hierarchical Encoding for mRNA Language Modeling Mehdi Yazdani-Jahromi , Mangal Prakash, Tommaso Mansi, Artem Moskalev, Rui Liao arxiv.org/abs/2410.12459 (International Conference on Learning Representations (ICLR 2025))	Jan 2025
Fair Bilevel Neural Network (FairBiNN): On Balancing fairness and accuracy via Stackelberg Equilibrium Mehdi Yazdani-Jahromi , Ali Khodabandeh Yalabadi, AmirArsalan Rajabi, Aida Tayebi, Ivan Garibay, Ozlem Garibay 10.52202/079017-3355 (Advances in Neural Information Processing Systems 37)	Jan 2024
Learning Fair Representations: Mitigating Statistical Dependencies Aida Tayebi, Mehdi Yazdani-Jahromi , Ali Khodabandeh Yalabadi, Niloofar Yousefi, Ozlem Ozmen Garibay 10.1007/978-3-031-60611-3_8 (International Conference on Human-Computer Interaction)	Jan 2024
FragXsiteDTI: Revealing Responsible Segments in Drug-Target Interaction with Transformer-Driven Interpretation Ali Khodabandeh Yalabadi, Mehdi Yazdani-Jahromi , Niloofar Yousefi, Aida Tayebi, Sina Abdidizaji, Ozlem Ozmen Garibay 10.1007/978-1-0716-3989-4_5 (International Conference on Research in Computational Molecular Biology)	Jan 2024
BindingSite-AugmentedDTA: enabling a next-generation pipeline for interpretable prediction models in drug repurposing Niloofar Yousefi, Mehdi Yazdani-Jahromi , Aida Tayebi, Elayaraja Kolanthai, Craig J Neal, Tanumoy Banerjee, Agnivo Gosai, Ganesh Balasubramanian, Sudipta Seal, Ozlem Ozmen Garibay 10.1093/bib/bbad136 (Briefings in Bioinformatics)	Jan 2023
AttentionSiteDTI: an interpretable graph-based model for drug-target interaction prediction using NLP sentence-level relation classification Mehdi Yazdani-Jahromi , Niloofar Yousefi, Aida Tayebi, Elayaraja Kolanthai, Craig J Neal, Sudipta Seal, Ozlem Ozmen Garibay 10.1093/bib/bbac272 (Briefings in Bioinformatics)	Jan 2022

Awards

Nominated for Best Dissertation Award at the University of Central Florida: 2025
Top Reviewer Award, NeurIPS 2025: 2025
Received \$30,000 Amazon Research Credits Award: 2023
Nominated for the Order of Pegasus Award: 2023
Outstanding Graduate Fellowship, University of Central Florida: 2021
Ranked 1st among 25,000 candidates in Iran's national entrance exam for the M.Sc. of Industrial Engineering: 2017
Ranked 2nd in the "Kharazmi" National Programming Competition: 2012

Teaching Experience

University of Central Florida, Teaching Assistant PHI 6679: Digital Ethics – Orlando, FL	Aug 2025 – Dec 2025
University of Central Florida, Teaching Assistant STA 5206: Statistical Analysis – Orlando, FL	May 2025 – Aug 2025
University of Central Florida, Teaching Assistant CAP 6737: Interactive Data Visualization – Orlando, FL	Jan 2025 – May 2025
University of Central Florida, Teaching Assistant CAP 5610: Machine Learning – Orlando, FL	Aug 2024 – Dec 2024
University of Central Florida, Teaching Assistant STA 6714: Data Preparation – Orlando, FL	Aug 2023 – Dec 2023
University of Central Florida, Teaching Assistant STA 5206: Statistical Analysis – Orlando, FL	May 2023 – Aug 2023
University of Central Florida, Guest Lecturer (Projects in Data Analytics) – Orlando, FL	Aug 2022 – Dec 2022
Sharif University of Technology, Teaching Assistant Data Mining – Tehran, Iran	Sept 2018 – Dec 2019

Development Experience

ZTech Team , Blockchain Developer • Developed blockchain applications on the Ethereum network using Solidity, including implementing ERC20 token standards and smart contracts for Initial Coin Offering (ICOs).	June 2020 – Dec 2020
BerimCafe , Lead Software Developer • Developed café and restaurant management software using Django and Flutter.	Jan 2019 – Dec 2020
TAEPO , Lead Software Developer • Created TAEPO (TOEFL Online Practice and Exam Platform) using Django, Vue.js, and Electron.js.	Jan 2019 – Mar 2020
MrZoro.ir , Lead Software Developer • Developed a Django-based to automate university meal reservations.	Feb 2018 – Dec 2019

Projects

DeepDrugDomain: Easy-to-use drug-target affinity and interaction prediction package for architecture design

- Developed an open-source Python package for drug-target affinity and interaction prediction using deep learning models, including Transformers and graph neural networks.
- Implemented a user-friendly API for drug-target affinity and interaction prediction.
- Published on GitHub

COVID-19 Data Collection and Screening Project

- Initiated and led an open-source project for COVID-19 data collection and screening, utilizing technologies such as Python, Django, and PostgreSQL for backend development link, and JavaScript, Vue.js for frontend development link, to support public health efforts during the pandemic.

Patents

Protein Translation Equivariant Encoding for mRNA Language Models (U.S. Non-Provisional Patent Application No. 19/727,645)

Jan 2025

Academic Services

Reviewer, *Briefings in Bioinformatics*

Reviewer, *Computational and Structural Biotechnology Journal*

Reviewer, IEEE Transactions on Neural Networks and Learning Systems Journal

Program Committee Member, AAAI Conference on Artificial Intelligence, Special Track on AI for Social Impact (2025, 2026)

Reviewer, Neurips The Thirty-Ninth Annual Conference on Neural Information Processing Systems (2025, 2026)

Skills

Programming Languages: Python, Dart, JavaScript, C++, C#, SQL, Solidity, MATLAB

Python Packages: Pytorch, Numpy, Pandas, Keras, TensorFlow, Scikit-learn, Scipy, Networkx, iGraph, DGL, Matplotlib, seaborn

JavaScript Frameworks: Vue.js, Electron, NativeScript

Tools: Kubernetes, Docker, Git, HTML, CSS, LATEX, AWS, Azure, Slurm

Quantitative Research: Machine Learning, Artificial Intelligence, Large Language Models, Generative AI, Genomic Sequence Modeling, Drug Discovery, Graph Neural Networks, Transformers, Recurrent Neural Networks, LSTMs, Mathematical Optimization, Mathematical Modeling

Soft Skills: Research team coordination, student mentoring, technical writing, conference presentations, resource allocation, strategic planning, analytical thinking, complex problem resolution, international team collaboration, multicultural communication, self-directed learning, professional networking

Certificates

Machine Learning Specialization

Jan 2024

- Stanford University and DeepLearning.AI
- Certificate

Python Fundamentals

Jan 2018

- Tehran University
- Certificate

Advanced Python

Jan 2018

- Maktabkhooneh
- Certificate

References

Dr. Ozlem Ozmen (Advisor)

- Assistant Professor, University of Central Florida Email

Dr. Mangal Prakash

- Senior Scientist, AI/ML at Johnson & Johnson (Janssen R&D) Email

Dr. Artem Moskalev

- Research Scientist, Johnson & Johnson (Janssen R&D) Email

Dr. Ivan Garibay

- Associate Professor, University of Central Florida Email