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

University of Central Florida, Post-Doctoral Researcher – Orlando, FL — Oct 2026 – present

- Conduct drug discovery research using mRNA language models, applying computational approaches to support therapeutic development.
- Mentor students and junior researchers in research design, data analysis, and scientific best practices.
- Contribute to grant development by drafting proposals, defining research aims, and communicating project methodologies and significance.
- Manage research projects and laboratory workflows, coordinating priorities, timelines, and resources to advance research objectives.

DeepBio Scientific, Senior Research Scientist – Orlando, FL — Jan 2026 – Oct 2026

- 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 ∼10% on expression, stability and riboswitch prediction, and generated mRNA sequences ∼4× 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 — Jan 2025
Mehdi Yazdani-Jahromi, Ali Khodabandeh Yalabadi, Ozlem Ozmen Garibay
10.52202/085713-0904 (Advances in Neural Information Processing Systems 38)

HELM: Hierarchical Encoding for mRNA Language Modeling — Jan 2025
Mehdi Yazdani-Jahromi, Mangal Prakash, Tommaso Mansi, Artem Moskalev, Rui Liao
arxiv.org/abs/2410.12459 (International Conference on Learning Representations (ICLR 2025))

Fair Bilevel Neural Network (FairBiNN): On Balancing fairness and accuracy via Stackelberg Equilibrium — Jan 2024
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)

MIRAGE: Measuring Interpolation and Redundancy in Affinity GEneralization — Jan 2026
Mehdi Yazdani-Jahromi, Sanjay Padhi, Ivan Garibay
arxiv.org/abs/2609.14491 (arXiv)

Geometric Relevance Is Not Sufficient: Evaluating Focused Post-Training Supervision in Diffusion Docking — Jan 2026
Michael Brown, Maryam Rahimimovassagh, **Mehdi Yazdani-Jahromi**, Sanjeda Sara Jennifer, Ivan Garibay
arxiv.org/abs/2611.08249 (arXiv)

FragXsiteDTI: Revealing Responsible Segments in Drug-Target Interaction with Transformer-Driven Interpretation — Jan 2024
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)

BindingSite-AugmentedDTA: enabling a next-generation pipeline for interpretable prediction models in drug repurposing — Jan 2023
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)

AttentionSiteDTI: an interpretable graph-based model for drug-target interaction prediction using NLP sentence-level relation classification — Jan 2022
Mehdi Yazdani-Jahromi, Niloofar Yousefi, Aida Tayebi, Elayaraja Kolanthai, Craig J Neal, Sudipta Seal, Ozlem Ozmen Garibay
10.1093/bib/bbac272 (Briefings in Bioinformatics)

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 June 2020 – Dec 2020
- Developed blockchain applications on the Ethereum network using Solidity, including implementing ERC20 token standards and smart contracts for Initial Coin Offering (ICOs).

BerimCafe, Lead Software Developer Jan 2019 – Dec 2020
- Developed cafè and restaurant management software using Django and Flutter.

TAEPO, Lead Software Developer Jan 2019 – Mar 2020
- Created TAEPO (TOEFL Online Practice and Exam Platform) using Django, Vue.js, and Electron.js.

MrZoro.ir, Lead Software Developer Feb 2018 – Dec 2019
- Developed a Django-based to automate university meal reservations.

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 Jan 2025
(U.S. Non-Provisional Patent Application No. 19/727,645)

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