

Alireza Omidi

Curriculum Vitae

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Education

- 2021–Present **Ph.D. in Bioinformatics**, *University of British Columbia*, Vancouver, BC, Canada.
2018–2021 **M.Sc. in Artificial Intelligence**, *Sharif University of Technology*, Tehran, Iran.
2013–18 **B.Sc. in Software Engineering**, *Isfahan University of Technology*, Isfahan, Iran.
2009–13 **Diploma of Mathematics**, *Ejei High School 1 (National Organization for Development of Exceptional Talents)*, Isfahan, Iran.

Interests

- Diffusion & Flow matching models
- Enhanced Sampling
- Large Language Models
- Protein Design & Drug Discovery

Publications

- [1] Brooks H Perkins-Jechow, Juan Pablo Iglesias Ahualli, Huyen Thuc Nhu, **Alireza Omidi**, Chunchao Li, Jorge A Holguin-Cruz, Daeahn Cho, Dokyun Na, Nawar Malhis, Jennifer M Bui, et al. Challenging alphafold in predicting proteins with large-scale allosteric transitions. *Nature Communications chemistry*, 8(1):378, 2025.
- [2] Anastasia Litinetskaya, Maiia Schulman, Fabiola Curion, Artur Szalata, **Alireza Omidi**, Mohammad Lotfollahi, and Fabian Theis. Integration and querying of multimodal single-cell data with poe-vae. *bioRxiv*, February 2025.
- [3] Haoning Howard Cen, Aurora J. Mattison, **Alireza Omidi**, Jason Rogalski, Libin Abraham, Guang Gao, Michael R. Gold, Leonard J. Foster, Jörg Gsponer, and James D. Johnson. Insulin-dependent and -independent dynamics of insulin receptor trafficking in muscle cells. *bioRxiv*, 2025.
- [4] **Alireza Omidi**, Mads Harder Møller, Nawar Malhis, Jennifer M. Bui, and Jörg Gsponer. Alphafold-multimer accurately captures interactions and dynamics of intrinsically disordered protein regions. *Proceedings of the National Academy of Sciences*, 121(44):e2406407121, October 2024.
- [5] Anastasia Litinetskaya, Maiia Shulman, Soroor Hediye-zadeh, Amir Ali Moinfar, Fabiola Curion, Artur Szalata, **Alireza Omidi**, Mohammad Lotfollahi, and Fabian J. Theis. Multimodal weakly supervised learning to identify disease-specific changes in single-cell atlases. *bioRxiv*, July 2024.
- [6] Mohammad Sadegh Akhondzadeh, **Alireza Omidi**, Zeinab Maleki, Kevin Coombes, Amanda E Toland, and Amir Asiaee. Learning cancer progression network from mutation allele frequencies. In *ICML Workshop on Computational Biology*. 2020.

Academic Experiences

- 2021–Present **Research Assistant**, *Gsponer Lab*, Michael Smith Laboratories, University of British Columbia (UBC).
- Assessed AlphaFold-Multimer on folding, binding-site prediction, and interaction prediction of intrinsically disordered protein regions (IDRs) under supervision of Prof. Jörg Gsponer.
 - Working on the identification of novel insulin receptor interactors, collaborating with Johnson's lab in UBC diabetes research group. We use AlphaFold-Multimer to identify such interactions.
 - Working on designing high-affinity binders for voltage-gated calcium channels in skeletal muscles. We use protein diffusion models (RFDiffusion) as well as a pipeline of AlphaFold-Multimer and ProteinMPNN to design novel binders in order to stabilize the channels.
 - Working on the prediction of protein-protein interaction (PPI) involving cancer-driving genes.
- 2020–2021 **Intern**, *Theis Lab*, Technical University Munich (TUM) & Helmholtz Zentrum Munich, Remote.
- Worked on “Multimodal weakly supervised learning to identify disease-specific changes in single-cell atlases” under supervision of Prof. Fabian J. Theis.
- 2019–2021 **Intern**, *Goodarzi Lab*, University of California San Francisco (UCSF), Remote.
- Worked on “Finding Novel Translational Regulatory Elements using convolutional neural networks” Under supervision of Prof. Hani Goodarzi.
- 2018–2021 **Research Assistant**, *Sharifi Lab*, Sharif University of Technology.
- Done collaborations with TUM and UCSF under supervision of Prof. Ali Sharifi-Zarchi.
- 2017–18 **Research Assistant**, *Maleki Lab*, Isfahan University of Technology.
- Worked on “Inferring Oncogenesis Graphs” under supervision of Dr. Amir Asiaee Taheri (OSU, US).
 - Worked on “Clustering Kidney Cancer Gene Expression Data” under supervision of Prof. Zeinab Maleki.
- 2017 **Teacher of “Machine Learning with Python” course**, *Isfahan University of Technology*.
- 2016 **Summer Intern**, *School of Advanced Technologies in Medicine*, Isfahan University of Medical Sciences.
- Worked on “Microarray analysis on breast cancer”.
- 2019 **Teacher Assistant**, *Sharif University of Technology*.
- Course(s):
- Introduction to Bioinformatics (Fall 2019)
 - Deep Learning (Fall 2020)
 - Modern Information Retrieval (Fall 2020)
- 2014–17 **Teacher Assistant**, *Isfahan University of Technology*.
- Courses:
- Introduction to Programming (Fall 2014, Fall 2015, Fall 2016)
 - Advanced Programming (Spring 2016)
 - Formal Languages & Automata Theory (Spring 2016, Spring 2017)
 - Discrete Mathematics (Spring 2016)

Work Experiences

- 2020–2021 **Data Scientist**, *Cafe Bazaar AI*, Tehran, Iran.
- Cafe Bazaar is a leading consumer internet company in Iran, running multiple products such as the most popular smartphone application marketplace for Persian speaking countries (Bazaar), the most popular online marketplace of Iran (Divar), and a widespread used map & navigation application (Balad). Cafe Bazaar AI is a section of the company working on novel AI-based services. Cafe Bazaar is serving more than 39 million Persian speaking people around the globe. I worked on these projects:
- **Automatic Speech Recognition (ASR)**: We developed *Negar*, a novel Deep Neural Network based ASR service to recognize Persian speech.
 - **Text to Speech (TTS)**: We developed *Chatterbox*, a Deep Learning based TTS services to convert Persian text into speech.

Volunteer Experiences

- 2015–18 **Co-founder & Chair**, *ACM Student Chapter*, Isfahan University of Technology.
- Organized four annual ACM Collegiate Programming Contests - Local (2015–18)
 - Organized two series of ACM-ICPC Preparation Class (2016, 2018)
- 2015–17 **Vice Chair (2016-17) & Core Member (2015-16)**, *Student Scientific Association of Computer Engineering*, Isfahan University of Technology.
- Organized the first “Data Mining Competition” of IUT in collaboration with Khabarfarsi.com (Spring 2017)
 - Organized “Data Science” conference in collaboration with Khabarfarsi.com (Spring 2017)
 - Organized “CAFE Talks” conference in collaboration with Cafebazaar.ir (Winter 2017)
 - Organized 1st “IUTFOSSCon”, Free & Open Source Congress of IUT (Fall 2015)
- 2017–18 **Editorial**, *Faramatn Magazine*, Isfahan University of Technology.
- Editorial of 10th & 11th issues of Faramatn (Hypertext) Magazine, a student magazine about computer science.

Honors & Awards

- 2018 **1st Place**, *National University Entrance Exam for M.Sc. Grade*, in Information Technology Engineering.
- 2018 **25th Place**, *National University Entrance Exam for M.Sc. Grade*, in Artificial Intelligence.
- 2016 **8th Place**, *41st Regional ACM-ICPC*, Tehran Site, Sharif University of Technology.
- 2015 **9th Place**, *40th Regional ACM-ICPC*, Tehran Site, Sharif University of Technology.
- 2014 **19th Place**, *39th Regional ACM-ICPC*, Tehran Site, Sharif University of Technology.
- 2017 **9th Place**, *42nd Regional ACM-ICPC*, Tehran Site, Sharif University of Technology (As Coach).
- 2017 **23rd Place**, *42nd Regional ACM-ICPC*, Tehran Site, Sharif University of Technology (As Coach).
- 2014 **1st Place**, *42nd ACM Local Programming Contest*, Isfahan University of Technology.
- 2015 **3rd Place**, *43rd ACM Local Programming Contest*, Isfahan University of Technology.
- 2017 **105th Place**, *IEEEExtreme 11.0*, among 3342 teams, IEEE.
- 2016 **109th Place**, *IEEEExtreme 10.0*, among over 2500 teams, IEEE.
- 2016 **2nd Place**, *1st IOT Cup*, Startup IoT.
- 2016 **top 2% Place**, *1st Sharif Code Cup*, among over 800 teams, Sharif University of Technology.
- 2017 **3rd Place**, *1st UI AI Challenge*, ACM Chapter, University of Isfahan.
- 2015 **5th Place**, *7th Sharif Java Challenge*, Sharif University of Technology.
- 2016 **Attended**, *1st Sharif AI Challenge*, On-site round, Sharif University of Technology.

Languages

English	Fluent
Persian	Native
French	Basic

References

Available upon request.