Sina Barazandeh

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Education

2024 – 2029 **Ph.D. Computational Biology**, School of Computer Science, Carnegie Mellon University, Pittsburgh, PA
Advisor: Dr. Jose Lugo-Martinez
Relevant Coursework: Machine Learning (10-701), Cellular and Systems Modeling, Introduction to Computational Structural Biology

2021 – 2024 **M.Sc. Computer Engineering**, Bilkent University, Ankara, Turkey
Thesis: Generative Models for Generating and Optimizing Biological Sequences
Advisor: Dr. A. Ercument Cicek **GPA:** 3.9/4.0

2016 – 2021 **B.Sc. Computer Engineering**, Shiraz University, Shiraz, Iran
Thesis: Implementation of Neural Collaborative Filtering
Advisor: Dr. Reza Boostani **GPA:** 3.5/4.0 (16.63/20)

Research Interests

- Foundation Models
- Machine Learning
- Deep Learning
- Computational Biology
- Bioinformatics
- Drug Design
- Reinforcement Learning
- Protein Engineering
- Laboratory Automation

Current Projects

2025 Reinforcement Learning for Senescence Biomarker Discovery
Manuscript in Preparation

2025 Evolution Informed Structural Subgraph-Based Protein Representations Outperform Foundation Models
Manuscript in Preparation

2025 Developing Agentic AI using RL and LLMs for Large-scale Automated Labs
Work in progress

Research Experience

2024 – Present **Graduate Research Assistant**
Carnegie Mellon University, School of Computer Science
Advisor: Dr. Jose Lugo-Martinez
• Biomarker Discovery, Protein Representations, and Automation of Science.

2021 – 2024 **Research Assistant**
Bilkent University, Department of Computer Engineering (CicekLab)
Advisor: Dr. A. Ercument Cicek
• Developed GANs and LLMs for biological sequence generation and optimization

2019 – 2020 **Undergraduate Research Assistant**
Shiraz University, Department of Computer Engineering
Advisor: Dr. Reza Boostani
Project: EEG to MEG signal translation using LSTM Neural Networks

Research Publications

Computational Biology

2025 Shukueian Tabrizi, Sobhan, **Sina Barazandeh**, Helyasadat Hashemi Aghdam, and A. Ercument Cicek. "RNAtranslator: Modeling protein-conditional RNA design as sequence-to-sequence natural language translation." *PLOS Computational Biology* 21, no. 10 (2025): e1013541.

2025 **Barazandeh, S.**, Furkan Ozden, Ahmet Hincer, Urartu Ozgur Safak Seker, and A. Ercument Cicek. "UTRGAN: Learning to generate 5' UTR sequences for optimized translation efficiency and gene expression." *Bioinformatics Advances* 5, no. 1 (2025): vbaf134.

2023 Ozden, Furkan, **Sina Barazandeh**, Dogus Akboga, Sobhan Shokoueian Tabrizi, Urartu Ozgur Safak Seker, and A. Ercument Cicek. "RNAGEN: A generative adversarial network-based model to generate synthetic RNA sequences to target proteins." *bioRxiv* (2023): 2023-07.

Other Publications

2018 Asali, Ehsan, Farzin Negahbani, Saeed Tafazzol, Mohammad Sadegh Maghareh, Shahryar Bahmeie, **Sina Barazandeh**, Shokoofeh Mirian, and Mahta Moshkelgosha. "Namira Soccer 2D Simulation Team Description Paper 2018." *RoboCup 2018*, Montreal, Canada

Skills

- **Programming Languages:** Python, R, Java, C/C++, Javascript, Elixir, Verilog
- **Machine Learning Frameworks:** PyTorch, Keras, Scikit-Learn
- **Foundation Models:** ESM-2, AlphaFold, Boltz, ProtT5, RoseTTAFold, DNABERT
- **Bioinformatics Tools:** BLAST, HMMER, Clustal, PyMOL, Galaxy, BioPython, NCBI Tools
- **Databases:** PDB, UniProt, NCBI, BioMart, Bioconductor
- **Computing Infrastructure:** SLURM, HPC Clusters
- **GPU Computing:** CUDA basics, Multi-GPU Training, PyTorch distributed training
- **Software Development:** Git, Docker, Singularity, CI/CD
- **Graphics & Image Processing:** OpenGL, OpenCV

Conferences and Presentations

2025 **SenNet Annual Meeting - Washington, DC**

2025 **PathVisions - San Diego, CA**

2023 **RECOMB - Istanbul, Turkey** (Volunteer)
Poster Presentation: **UTRGAN**

2023 **RECOMB-SEQ - Istanbul, Turkey**
Poster Presentation: Using Minimizer Interarrival Distances for Read-Until Human Read Detection from Blood Samples Sequenced by Oxford Nanopore

2023 **HIBIT - Ankara, Turkey**
Oral Presentation: **RNAGEN(Second Best Presentation Award)**

2019 **Shiraz University** (Invited Presentation)
Introduction to Soccer 2D Simulation

Awards & Honors

2021 Comprehensive Graduate Scholarship, Bilkent University
2021 Best Start-Up in Southern Iran Award (GhasedakApp)
2021 Ranked 1st in Hardware Engineering, Top 10% of Class of 2020
2018 8th Place (out of 32 teams), RoboCup Soccer 2D Simulation League, Montreal, Canada
2018 5th Place (out of 24 teams), Iran Open Soccer 2D Simulation League, Tehran, Iran
2016 Full National Scholarship for Undergraduate CS Program, Shiraz University, Iran

Teaching Experience

2023 **Teaching Assistant:** Computational Medicine
Carnegie Mellon University Instructor: Dr. Wei Wu

2023 **Teaching Assistant:** Programming and Algorithms
Bilkent University Instructor: Dr. Ugur Dogrusoz

2022 **Teaching Assistant:** Artificial Intelligence
Bilkent University Instructor: Dr. Ozgur Oguz

2021 **Teaching Assistant:** Introduction to Machine Learning
Bilkent University Instructor: Dr. Aysegul Dundar

Academic Service

2025 **Subreviewer** - ISMB Conference
2024 **Subreviewer** - RECOMB Conference
2023 **Subreviewer** - ISCB Conference
2023 **Subreviewer** - RECOMB-SEQ Satellite Conference
2022 **Subreviewer** - RECOMB Conference
2022 **Subreviewer** - ISBRA Symposium
2022 **Subreviewer** - ACM-BCB Conference

Course Research Projects

2025 Investigating ProtT5 and ESM Embeddings Disentanglement on Multi-Chain Proteins
Instructor: David Ryan Koes

2025 Complex Cellular Circuit Design for Stable Cellular Systems
Instructor: James R. Faeder and Keisuke Ishihara

2024 VAE Disentanglement Analysis on Noisy data using Residual Connections
Instructors: Maria Florina Balcan and Geoffrey J Gordon

2023 Benchmarking Long-read *de novo* Genome Assembly Tools for Metagenomics
Instructor: Dr. Inanc Birol

2022 Bit-Packing for Contig Content Summarization Applications
Instructor: Dr. Inanc Birol

2021 Text-Driven Face Image Manipulation in GANs
Course: Generative Networks

2021 Attention-Based Encoder-Decoder Anomaly Detection
Course: Deep Learning

Software Engineering Projects

2023 **Deep Learning meets Blockchain for Automated and Secure Access Control**
Collaborators: Asma Jodeiri Akbarfam, **Sina Barazandeh**, Deepti Gupta, Hoda Maleki
Deployed deep learning models on Public Amazon Employee Access Challenge dataset for enterprise access management

Entrepreneurial Experience

2019-2022 **Co-Founder and Backend Developer**
Ghasedak Institution, Shiraz, Iran
Developed backend infrastructure for a online store for an Amazon-level access to book stores accross the country.

Leadership & Extracurricular Activities

2019-2021 **Vice-President**, Interdisciplinary Robotics Association
Shiraz University, Shiraz, Iran
Led initiatives promoting robotics education and organized inter-departmental meetings.

References

- **Dr. Jose Lugo-Martinez**
  Assistant Professor, School of Computer Science, Carnegie Mellon University
  Email: jlugomar@cs.cmu.edu
- **Dr. A. Ercument Cicek**
  Associate Professor, Department of Computer Engineering, Bilkent University
  Adjunct Professor, Computational Biology Department, Carnegie Mellon University
  Email: cicek@cs.bilkent.edu.tr
- **Dr. Inanc Birol**
  Professor, University of British Columbia
  Principal Investigator, BC Cancer Research Institute
  Email: ibirol@bcgsc.ca