Sina Barazandeh

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Summary

Ph.D. student in Computational Biology at Carnegie Mellon University (SCS) applying machine learning to biological sequence design, protein representation learning, biomarker discovery, and scientific lab automation. Experienced building production-ready TensorFlow and PyTorch pipelines and running large-scale experiments on HPC/SLURM clusters. First-author publication in *Bioinformatics Advances* (2025) and co-author in *PLOS Computational Biology* (2025). Expertise include C++ and python for foundation models, generative AI for omics data, and single-cell data analysis.

Education

Carnegie Mellon University — Pittsburgh, PA
Ph.D., Computational Biology | Advisor: Jose Lugo-Martinez — *Aug 2024 – May 2029*
- Coursework: Machine Learning (10-701), Cellular & Systems Modeling, Computational Structural Biology

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

Shiraz University — Shiraz, Iran
B.Sc., Computer Engineering | GPA: 3.5/4.0 — *Sep 2016 – Jun 2021*

Technical Skills

ML/AI: PyTorch, Keras, Scikit-Learn, Multi-GPU Training; GANs/VAEs, Reinforcement Learning, LLMs
GPU Computing: CUDA basics, PyTorch distributed training
Foundation Models: ESM-2, AlphaFold, Boltz, ProtT5, RoseTTAFold, DNABERT
Bioinformatics: BLAST, HMMER, Clustal, PyMOL, BioPython; PDB, UniProt, NCBI databases
Programming & Systems: Python, C/C++, Java, R; Git, Docker, Singularity; SLURM, HPC Clusters, CI/CD

Research Experience

Carnegie Mellon University, School of Computer Science — Pittsburgh, PA
Graduate Research Assistant | Advisor: Jose Lugo-Martinez — *Aug 2024 – Present*
- Developing RL frameworks for senescence biomarker discovery using PPO with robust evaluation protocols
- Building evolution-informed structural protein representations that outperform ESM-2 on downstream tasks
- Creating agentic AI systems using RL and LLMs for laboratory automation (CMU Cloud Lab project)

Bilkent University, Department of Computer Engineering — Ankara, Turkey
Research Assistant, CicekLab | Advisor: A. Ercument Cicek — *Sep 2021 – Jun 2024*
- **UTRGAN** (first author, *Bioinformatics Advances* 2025): Developed GAN for optimizing 5' UTR sequences, improving translation efficiency by generating sequences with enhanced gene expression
- **RNAtranslator** (co-author, *PLOS Comp Bio* 2025): Contributed to seq2seq model for protein-conditional RNA design using transformer architectures
- **RNAGEN**: Created generative model for synthesizing RNA sequences targeting specific proteins

Selected Publications

- **S. Barazandeh**, F. Ozden, A. Hincer, U.O.S. Seker, A.E. Cicek. "UTRGAN: Learning to generate 5' UTR sequences for optimized translation efficiency and gene expression." ***Bioinformatics Advances***, 5(1): vbaf134, 2025.
- S.S. Tabrizi, **S. Barazandeh**, H.H. Aghdam, A.E. Cicek. "RNAtranslator: Modeling protein-conditional RNA design as sequence-to-sequence natural language translation." ***PLOS Computational Biology***, 21(10): e1013541, 2025.

Awards & Achievements

Second Best Presentation Award, HIBIT Conference, Ankara, Turkey — 2023
Comprehensive Graduate Scholarship, Bilkent University (Full tuition + stipend) — 2021–2024
Best Start-Up in Southern Iran, GhasedakApp — 2021
8th Place (32 teams), RoboCup Soccer 2D Simulation League, Montreal, Canada — 2018
Full National Scholarship, Shiraz University — 2016–2021

Additional Experience

Teaching Assistant | CMU & Bilkent University — 2021 – 2023
Courses: Computational Medicine, Programming & Algorithms, Artificial Intelligence, Machine Learning
Co-Founder & Backend Developer | Ghasedak Institution, Shiraz, Iran — 2019 – 2022
Developed backend infrastructure for educational e-commerce platform serving southern Iran
Subreviewer | ISMB, RECOMB, RECOMB-SEQ, ISCB, ISBRA, ACM-BCB — 2022 – 2025