Loghman Samani

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Ludwigsburg, Baden-Württemberg, Germany

Research Interests

My research lies at the intersection of computational biology, deep learning, and structural biology, with a particular focus on advancing diffusion models for predicting and understanding protein structures. I am passionate about leveraging state-of-the-art machine learning techniques to unravel complex biological systems, from molecular interactions to cognitive processes. My work explores the application of deep learning methodologies in solving critical challenges in molecular biology, such as protein folding, ligand binding, and drug discovery. Additionally, I have a keen interest in cognitive neuroscience, where I aim to bridge insights from neural networks and biological brains to develop more interpretable and biologically inspired AI models.

Education

- **University of Stuttgart** — *Apr 2023 - Apr 2025*
  Master of Science in Technical Biology — Stuttgart, Germany
  - Thesis Grade: 1.3 (Excellent)
  - Overall GPA: 1.4
- **University of Kurdistan** — *Sep 2014 - Jun 2018*
  Bachelor of Science in Cell and Molecular Biology — Sanandaj, Iran
  - GPA: 15/20

Experience

- **Institute for Stochastics and Applications (ISA) [🌐]** — *Feb 2025 - Present*
  Research Assistant — Stuttgart, Germany
  - working on a paper!!!
  - Implemented [technology/method], enhancing [specific aspect] by [specific percentage]
  - Conducted analysis on [specific data], identifying [key findings]
  - Presented findings at [specific event], receiving [specific recognition]
- **Institute of Cell Biology and Immunology (IZI) [🌐]** — *Jun 2024 - Jul 2024*
  Cell Biology Intern — Stuttgart, Germany
  - Utilized CRISPR/Cas9 for gene function analysis and studied cancer pathways
  - Conducted flow cytometry to analyze cell death modalities and cell viability (MTT assays)
  - Performed image processing and analysis using FIJI software and time-lapse imaging
  - Operated confocal microscopy to capture high-resolution cellular images

Projects

- **GRN-Designer: Automatically Design and Optimize Gene Regulatory Networks** — *Apr 2024 - Feb 2025*
  Tools: PyTorch, Evolutionary Algorithms, PDEs [🌐][GitHub]
  - Built an AI-driven framework using evolutionary and gradient-based optimization.
  - Simulated spatial gene expression with PDE-based models.
  - Optimized regulatory parameters for accurate pattern formation.
  - Applied hybrid optimization to improve efficiency and adaptability.
- **Deep Learning: Models, Articles, and Implementations** — *Jan 2024 - Present*
  Tools: PyTorch, TensorFlow [GitHub]
  - Built 15+ deep learning models, including CNNs, RNNs, and Transformers.
  - Developed a GPT-2-like model from scratch to explore LLM architectures.
  - Implemented optimization techniques like SGD, Adam, and Learning Rate Decay.
  - Published two articles on Towards Data Science explaining deep learning concepts.
- **Biostoch: Stochastic and Deterministic Biological Simulations** — *Apr 2023 - Jun 2024*
  Tools: Python, NumPy, SciPy [GitHub]
  - Developed a Python library for simulating biological systems.
  - Implemented SSA, Tau-Leaping, and CLE for stochastic modeling.
  - Integrated Euler and Runge-Kutta methods for deterministic simulations.

- **SmartSolve: Simplified Machine Learning Workflows** *Apr 2023 - Jun 2024*
  Tools: Python, Scikit-Learn, NumPy [GitHub]
  - Developed a Python library for streamlined ML model training and evaluation.
  - Implemented regression, classification, clustering, and ensemble methods.
  - Integrated preprocessing tools for feature scaling and encoding.

Patents and Publications

C=Conference, J=Journal, P=Patent, S=In Submission, T=Thesis

[S.1] Your Name, et al. (Year). **Title of Submitted Paper**. Manuscript submitted for publication in *Journal Name*.

Skills

- **Programming Languages:** Python, R, SQL
- **Data Science & Machine Learning:** TensorFlow, PyTorch, scikit-learn, pandas
- **Bioinformatics & Computational Biology:** Bioconductor, Biopython
- **Numerical Simulation:** Numerical Simulation Techniques
- **Laboratory Techniques:** Cell viability assays (MTT), Confocal Microscopy, Time-lapse imaging, Flow Cytometry, Western Blotting, EVOS epi-fluorescence

Honors and Awards

- **11th Place, Cell and Molecular Biology Olympiad** *2018*
  Iran's National Scientific Competition
  - Ranked 11th in the final stage of the Cell and Molecular Biology Olympiad.
  - Demonstrated strong expertise in cell and molecular biology, out of a competitive field.
- **Member of the Elite Students Foundation** *2018*
  University of Kurdistan
  - Inducted based on ranking 14th in the national Master's exam in Biophysics and 11th in the Olympiad.
  - Gained recognition as one of the top students in the country in the field of Biophysics and Cell and Molecular Biology.

Certifications

- **Deep Learning Specialization** *Aug 2024*
- **Machine Learning Specialization** *Feb 2024*
- **Mathematics for Machine Learning and Data Science Specialization** *Jan 2024*
- **Genomic Data Science Specialization** *Nov 2023*

Additional Information

Languages: Kurdish (Native), Persian (Fluent), English (Fluent), German (Fluent)
Interests: Quantum Physics, Cognitive Neuroscience, Martial Arts, Chess, Movies

References

1. **Reference Person 1**
   Job Title, Department
   Organization/Institution Name
   Email: email1@example.com
   Phone: +X-XXX-XXX-XXXX
   Relationship: [e.g., Thesis Advisor, Manager, etc.]

2. **Reference Person 2**
   Job Title, Department
   Organization/Institution Name
   Email: email2@example.com
   Phone: +X-XXX-XXX-XXXX
   Relationship: [e.g., Project Supervisor, Colleague, etc.]