Helyaneh Ziaei Jam

📞 949.201.5332 | ✉ hziaeija@ucsd.edu | ⌗ heliziii

Summer availability: June 15 - September 15

EDUCATION

University of California, San Diego, *GPA: 3.92/4* Jan. 2021 – Present
Ph.D. in Computer Science and Engineering. Advisor: Prof. Melissa Gymrek San Diego, CA

Sharif University of Technology, *GPA: 3.87/4* Sep. 2015 – July. 2020
B.Sc. in Software Engineering Tehran, Iran

SKILLS

- Knowledge in mathematical and statistical modeling, data structures, algorithms, linear algebra, natural language processing, optimization, recommender systems, stochastic processes, hypothesis testing, and probability theory.
- Experienced in software and data-science framework development using **Python** and **C++**.
- Extensive experience in model development using R and Python packages including Pandas, NumPy, Scikit-learn, Pytorch, and SKlearn. Experienced in working with SQL.
- Experienced in data analysis and visualization and applying machine learning and deep learning algorithms on various large datasets and model assessment using informative metrics.
- Experienced in High Performance Computing **(HPC)**, Linux environment, profiling, GPU programming, and Git version control.
- Skilled in team work and communicating with peers, managers, and stakeholders from diverse background.

PUBLICATIONS

- **Ziaei Jam H**, et al. "A deep population reference panel of tandem repeat variation." Nature Communications. 2023. PMID: 36945429
- Lundström OS, Verbiest MA, Xia F, **Ziaei Jam H**, et al. "WebSTR: A Population-wide Database of Short Tandem Repeat Variation in Humans." Journal of Molecular Biology. 2023. PMID: 37678708
- English A, Dolzhenko E, **Ziaei Jam H**, et al. "Benchmarking of small and large variants across tandem repeats." preprint on biorxiv
- Huang B, Durvasula A, Mousavi N, **Ziaei Jam H**, et al. "Genome-wide selection inference at short tandem repeats." preprint on biorxiv
- Sehgal A, **Ziaei Jam H**, et al. "Genome-wide detection of somatic mosaicism at short tandem repeats." preprint on biorxiv

EXPERIENCE

Illumina, Inc. AI Lab June. 2022 – September 2022
Data Scientist Intern Foster City, CA

- **Non-linear covariate correction for phenotype prediction:** Trained and tested Boosted Trees and Multi-layer perceptron models to assess their performance in predicting phenotype values based on environmental factors and common associated variants. Compared the performance against a typical linear model with various methods including rare variant and enrichment analysis. Increased the averaged variation explained by 4.16% and found at least one significant false positive rare variant.

University of California San Diego April. 2021 – Present
Graduate Research Assistant at Gymrek lab, selected projects San Diego, CA

- **A global reference for human genetic variations in tandem repeats:** Developed a method that takes tandem repeat calls from various tools as input and outputs a consensus TR callset. We further used this callset for various analysis on the human genome including selection pattern differences across populations and identifying novel sequence-context features contributing to tandem repeat variability using deep learning models. Presented as a platform talk at **ASHG 2022**, Los Angeles, CA.

- **Genotyping short tandem repeats using long reads:** Developed a tool in C++ for quantifying tandem repeats using long reads data. Our tool significantly outperforms current tools by speed and it outputs a more reliable and informative callset. Presented as an oral talk at **RECOMB-seq 2022**, San Diego, CA.

Sharif University of Technology   November. 2018 – July. 2020
Research Assistant   Tehran, Iran

- **Assessing Potential of Stem Cells to generate new vessels:** Trained a **U-net** neural network using Keras to segment vessels in human tissue images for assessing potential of various stem-cells in forming new vessels.

Max Plank Institute   Summer 2019 – Winter. 2020
Research Intern Under supervision of Prof. Tobias Marschall   Saarbrücken, Germany

- Designed and tested a **classifier** for partitioning long reads to haplotype-specific sets based on their alignments to the De Bruijn graph.

University of Tartu   Summer 2018
Software Engineer Intern   Tartu, Estonia

- Design and implementation of a high-level and object-oriented quantum programming language in C++ that translates to different quantum assembly languages such as QASM.

TEACHING

- **Teaching Assistant at Sharif University of Technology, Department of Computer Engineering**
  Courses: Artificial Intelligence, Data Structures, Probability and statistics, Numerical methods and Technical and scientific presentation.

HONORS AND AWARDS

- Recipient of UC San Diego University **Doctoral Fellowship**, United States, 2021.
- Recipient of the scholarship for research internship at Max Planck Institute for Informatics, Germany, Summer 2019, Winter 2020.
- Recipient of the scholarship for research internship at University of Tartu, Estonia, 2018
- **Silver Medal** in the National Astronomy and Astrophysics Olympiad Iran, 2014
- **198th** amongst More Than 180,000 Participants in Iranian Nation-wide University Entrance Exam, Mathematics and Physics Discipline, 2015.
- Recipient of the grant for undergraduate studies from Irans **National Elites Foundation**, for outstanding academic success.