SIMRAN KADADI

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PROFILE

- A 3rd -year PhD student in Purdue CS with over 5 years of computational biology research experience
- Formulated and developed machine learning-based and deep learning-based (Support Vector Machine, Naïve Bayes, Multi-Layer Perceptron, Graph Neural Network, Variational Autoencoders, Transformers, LLMs, Foundation Models) methods with biological applications
- Experience in analyzing genetic (scRNA-seq, RNA-seq) and epigenetic (CHIP-seq) profiles, along with high-throughput multi-omics data
- Expertise in NGS data processing and analysis tools (e.g., Seurat, Scanpy, CellRanger, Samtools)
- Proficient in Python and R programming languages, with expertise in scientific libraries such as Pandas.
- Experienced in working on High-Performance Computing clusters
- Analyzed omics and clinical data from large databases, including GEO

WORK EXPERIENCE

Kazemian Lab - Computer Science PhD student *August 2023 – Present*
Advisor: Dr. Majid Kazemian

- Engineered a deep learning model using protein language models and contrastive learning to predict B-cell viral epitopes, achieving 10% improvement over the baseline
- Built an antimicrobial peptide detection model; Preprint in Progress
- Designed cancer-type-conditioned diffusion model leveraging protein language models to generate novel anticancer peptides with tunable therapeutic properties (i.e., length, charge, hydrophobicity)
- Partnered with Purdue University's Olson Lab to build a spatial transcriptomics analysis pipeline, uncovering the interaction between GZMA-expressing monocytes and T cell infiltration in NSCLC tumors

Volkening Lab - Undergraduate Research Assistant *September 2022 – December 2022*
Advisor: Dr. Alexandria Volkening

- Applied computer vision techniques to long-term time-lapse confocal imaging, tracking meristem progenitor cell replication and division patterns
- Identified spatial and temporal trends in Ceratopteris richardii meristem progenitor cell division, utilizing Ilastik for segmentation and image analysis
- Engineered predictive features based on cell morphology, proliferation rates, and spatial positioning to uncover underlying regulatory mechanisms governing cell fate decisions

Kazemian Lab - Undergraduate Research Assistant *December 2020 – May 2023*
Advisor: Dr. Majid Kazemian

- Analyzed scRNA-seq data to study the correlation between Epstein-Barr virus (EBV) infection and invasive nasopharyngeal cancer, identifying potential viral-host interactions driving tumor progression
- Implemented Seurat pipelines and 10x Genomics tools to process and analyze thousands of single-cell transcriptomes, revealing cancer stem cell heterogeneity and novel therapeutic targets
- Investigated the impact of EBV infection on cancer stem cell proliferation in nasopharyngeal carcinoma, contributing to understanding viral oncogenesis

EDUCATION

Purdue University *August 2023 – May 2028*
PhD in Computer Science; Lynn Fellow
Relevant Coursework: CS 580 - Advanced Analysis of Algorithms, CS 578 - Statistical Machine Learning, CS 593 - Machine Learning Theory, CS 573 - Data Mining, CS 530 - Scientific Visualization, CS 536 - Data Communication and Computer Networks

Purdue University *August 2019 – May 2023*
Bachelor's in Computer Science
Relevant Coursework: BCHM 495 - Computational Genomics, CS 381 - Analysis of Algorithms, ENGL 421 - Technical Writing, CS 252 Systems Programming, CS 373 - Machine Learning, CS 471 - Artificial Intelligence
Activities: Computer Science Undergraduate Student Board

SELECTED PUBLICATIONS

Yan, B, Wang, C, Chakravorty, S, Z. Zhang, **Kadadi, S.**, Sahoo, S, Wang, L, Anderson, N, Sirit, I, Shao, K, Liu, X, Olson, M, Afzali, B , Zhao, B, Kazemian, M . A comprehensive single cell data analysis of lymphoblastoid cells reveals the role of super-enhancers in maintaining EBV latency. J Med Virol. 2022; 95:e28362. doi:10.1002/jmv.28362

SELECTED ACCOLADES

Purdue University Lynn Fellowship 2024
Science Excellence Scholarship from Purdue Computer Science 2023
Computing Research Association (CRA) Undergraduate Researcher Award 2022 - Honorable Mention
Recipient of NIGMS Diversity Supplement
Purdue University Center for Cancer Research's Summer Undergrad Research Award 20-21

TECHNICAL SKILLS

- Programming languages - Proficient in Python, R, Java, C/C++; Familiar with JavaScript, NodeJS, Bash
- Operating systems – Mac OS, Unix/Linux, Windows
- Other - Scikit-learn, Pandas, NumPy, MATLAB, PyTorch, Github, Docker, Slurm, AWS, HPC, Jupyter, Keras, Tensorflow

SELECTED PROFESSIONAL ACTIVITIES

- Graduate Liason of Purdue University Computer Science Undergraduate Student Board 2019-2023
- GTA CS 252 - Systems Programming (Spring 2025, Fall 2025, Spring 2026)
- Mentoring three undergraduate students

Zain Sohail	Computer Science, Purdue University	(since Nov 2024)
Yongqi Yang	Biomedical Engineering, Wuhan University	(since Nov 2024)
Alexander Mihalcea	Pharmaceutical Science, Purdue University	(since Jan 2026)