Willard Ford

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Education

B.S. Bioinformatics, Probability and Statistics *San Diego, CA*

UNIVERISTY OF CALIFORNIA, SAN DIEGO *Sep. 2021 - Jun 2025*

- Led weekly discussions as Instructional Assistant for Calculus-Based Introductory Probability and Statistics, MATH 11, Fall 2024
- Led weekly discussions as Instructional Assistant for Genetics, BICD 100, Spring 2023

Research Experience

Gymrek Lab, University of California, San Diego *San Diego, CA*

UNDERGRADUATE RESEARCHER *Aug. 2023 - Cur.*

- Designed and built pangenome wide association study framework to elucidate structural variants in oft ignored populations using All of Us biobank.
- Implemented and tested several pangenome complexity metrics to quantify the degree of variation across the human genome.
- Generated figures and data for Human Pangenome Research Consortium (HPRC) research presentation.

Long Read Lab, Data Sciences Platform, The Broad Institute of MIT and Harvard *Cambridge, MA*

BROAD SUMMER RESEARCH PROGRAM INTERN *Jun. 2024 - Aug. 2024*

- Reduced runtime of novel haplotype integration tool by several orders of magnitude while maintainig 95% accuracy.
- Theorized, tested, and implemented various locality-sensitive hashing techniques on long-read structural variant sequences to determine best performance on novel data type.
- Presented results in institution wide poster fair and at ABRCMS, winning presentation award in computational biology.

Evolutionary Genomics Team, Allen Institute for Brain Science *Seattle, WA*

SUMMER INTERN *Jun. 2023 - Aug. 2023*

- Developed a deep-learning training pipeline for regulatory DNA model (scBasset) to assist staff scientists' in-silico experimental design and analysis.
- Interpreted multi-omic DNA sequence models to recover known motifs and predict accessibility of 16 synthetic de-novo motifs.
- Presented results in institution wide poster fair.

Yeo Lab, University of California, San Diego *San Diego, CA*

UNDERGRADUATE RESEARCHER *Jan. 2023 - Jun. 2023*

- Analyzed RNA binding protein interactome data and single cell RNA sequence data to inform future experiments for translational ALS research.
- Generated publication figures such as heatmaps and gene ontology dot plots using Python visualization tools leading to Al-Azzam et al, 2024.

Publications

Al-Azzam et al. Inhibition of RNA splicing triggers CHMP7 nuclear entry, impacting TDP-43 function and leading to the onset of ALS cellular phenotypes, Neuron, 2024

Honors & Awards

2024	**Presentation Award in Computational Biology**, Annual Biomedical Research Conference for Minoritized Scientists	*Pittsburgh, PA*
2024	**Travel Awardee**, Annual Biomedical Research Conference for Minoritized Scientists	*Pittsburgh, PA*
2024	**NIH Sponsored Travel Award**, Inaugural 4D Nucleome Hackathon	*Seattle, WA*
2023	**Top 10 Team Award**, Women in Computing Hackathon	*San Diego, CA*
2023	**Best Overall Award**, Inaugural Hackarama hosted by LPL Financial	*San Diego, CA*
2023	**CS50's Introduction to Artificial Intelligence with Python**, Certification	*San Diego, CA*
2022	**Google Data Analytics Specialization**, Coursera Certification	*Salt Lake City, UT*

Presentations

Annual Biomedical Research Conference for Minoritized Scientists *Pittsburg, PA*

FAST STRUCTURAL VARIANT MERGING AT A POPULATION SCALE *Nov. 2024*

- Presented poster on algorithmic optimizations to novel long-read variant caller to ABRCMS attendees, winning presentation award in computational biology.

Annual Summer Research Conference at UC San Diego   *San Diego, CA*

Fast Structural Variant Merging at a Population Scale   *Aug. 2024*

- Presented algorithmic optimizations to novel long-read variant caller to bioinformatics faculty and students.

Triton Neurotech Blitz Talk   *San Diego, CA*

How Can Machine Learning Lead to Better Healthcare?   *Feb. 2024*

- Introduced convolutional deep learning to 15 neuroscience-interested undergraduates.

Leadership

Undergraduate Bioinformatics Club, UBIC   *San Diego, CA*

Workshop Chair, Member   *Sep. 2023 - Cur.*

- Led and designed 12, 90 minute introductory workshops on computational biology topics not covered in UCSD coursework, reaching 25 students on average.
- Mentored 2 first year bioinformatics undergraduates in adjusting to college courses and in finding research positions that suited their interests.

UCSD Dancesport Team   *San Diego, CA*

Treasurer, Board Member   *Sep. 2022 - Cur.*

- Planned and led team practices for 30 members 4 days/week and organized other board members to lead practices.
- Twice organized and hosted 18 university ballroom teams and $\geq$ 250 dancers in annual intercollegiate competition, raising $\geq$ \$5,000 profit yearly.
- Organized travel, hotels, and food for $\geq$ 20 members to travel to 7 competitions each year.
- Recruited and welcomed dozens of new members each Fall.

Mentor Collective   *San Diego, CA*

Mentor   *Sep. 2023 - Cur.*

- Mentored 2 first year undergraduates and 1 transfer student through their first years at UCSD.
- Introduced mentees to student organizations and research programs that align with their goals of medical school, PhD, and industry.
- Suggested techinques to help mentees adjust to rigor of college courses.