Srujan Yamali

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Education

University of California, Berkeley
B.A. in Molecular and Cellular Biology & Computer Science *Aug. 2025 – May 2029*

Experience

Research Assistant June 2023 – August 2024
University of Delaware – Shao Lab *Newark, DE*

- Leveraged computer vision models through OpenCV to analyze *Drosophila melanogaster* mating behaviors and measured the influence of addictive agents on behaviors using 730 gigabytes of data.
- Researched how the neural architecture and principles involved in transforming sensory stimuli into reward perception in *Drosophila* Neuropeptide F signaling can be used to reduce addiction.
- Worked on an independent research project with Gertrud Schupbach of Princeton University into *Drosophila melanogaster* Thigmotaxis behaviors and how different genome types affect this behavior through sexual reward.
- Developed a program to capture Thigmotaxis data for high-throughput data analysis, developing a method to show how *Drosophila melanogaster* can be used as a model organism for anxiety research.

Assistant Bioinformatician Nov 2023 – Present
Childrens Hospital of Philadelphia – Moustafa Lab *Philadelphia, PA*

- Designed a program to analyze evolutionary relationships in bacterial proteomic data using data structures through Jaccard similarity-based genome set comparisons to detect recombination regions.
- Integrated kernel-based probabilistic changepoint analysis, enabling precise identification of recombination breakpoints across a dataset of over 75,000 microbial genomes.
- Validated the tool's accuracy by successfully detecting known bacterial recombination events, and produced high-resolution visualizations of evolutionary hotspots for comparative genomics studies.

Research Intern March 2024 – August 2024
Cornell University - Hein Lab *Ithaca, NY*

- Developed machine learning models to analyze ecological interactions in coral reef fish populations.
- Applied deep learning techniques, including YOLO-based object detection, to automate the identification and tracking of individual fish behaviors from field video data.
- Assisted in inferring decision-making rules using stochastic models and dynamic behavioral sequences.
- Contributed to data-driven model development to understand how individual-level behaviors influence collective and ecological dynamics in coral reef ecosystems.

Research Trainee August 2023
Perelman School of Medicine – Gupta Lab *Philadelphia, PA*

- Handled tasks involving protein structural analysis, including protein purification and crystallization.
- Developed cell cultures using inverse PCR for point mutation in *E. coli*.
- Performed SDS-PAGE and Western blotting to verify protein expression and purity.
- Assisted in X-ray crystallography data collection and analysis for structural determination.
- Maintained sterile lab techniques for bacterial transformation and plasmid preparation.

Publications & Conferences

R. Oliver, S. Yamali, S. Knox, T. Dadyala, L. Shao. *High-Throughput Behavioral Assay Unveils Female Courtship in Drosophila.* Proceedings of the International Behavioral and Neural Genetics Society, Western University, London, ON, Canada, 2024.

R. Oliver, S. Yamali, S. Knox, T. Dadyala, L. Shao. *High-Throughput Behavioral Assay Unveils Female Courtship in Drosophila.* Sexually Dimorphic Circuits and Behaviors, Janelia Research Campus, Howard Hughes Medical Institute, Ashburn, VA, 2024.

A. Moustafa, E. Theiller, A. Lal, S. Yamali, A. Feder, A. Narechania, P. Planet. *Redcarpet: A Tool for Rapid Recombination Detection in Staphylococcus aureus and Other Species Amidst Expanding Genomic Databases.* 19th International Symposium on Staphylococci and Staphylococcal Infections, Perth, Australia, 2024.

Technical Skills

Languages: Python, JavaScript, HTML/CSS, R, C++
Libraries: Pandas, OpenCV, Ruptures, NumPy, SciPy, Scikit-Learn, Matplotlib, Seaborn, PyQt6
Lab Skills: Gel Electrophoresis, Polymerase Chain Reaction, Mutagenesis, Cell Culturing, Bacterial Transformation