

# Gino Prasad

🏠 gino.bio | ✉ ginoprasad@gmail.com | 🐙 github.com/GinoP123 | 🔗 linkedin.com/in/ginoprasad | 🎓 Google Scholar

Cancer Genomics | Machine Learning | Bioinformatics | Computer Vision | Data Science

## Education

### PhD in Computer Science (Bioinformatics), UC San Diego

Summer 2023 – Spring 2027

#### NSF Graduate Research Fellow (Fall 2025 – Present)

Academic Advisor: [Vineet Bafna](#), Professor of Computer Science, Bioinformatics and Systems Biology

GPA: 3.96 / 4.00

- **Focus:** Applied Machine Learning for Bioinformatics
- **Relevant Courses:** Deep Learning, Bioinformatics Algorithms, Population Genomics, Generative AI Modeling, Recommender Systems

### Bachelor of Science, Bioinformatics: UC San Diego

Fall 2020 - Spring 2023

Major: Bioinformatics (B.S.), Minor: Computer Science

GPA 3.97/4.0

- **Relevant Courses:** Machine Learning, Molecular Sequence Analysis, Probability & Statistics, Linear Algebra, Data Structures, Algorithms

## Experience

### Data Science & Machine Learning Intern

Jun 2025 - Aug 2025

Genentech Research & Development (gRED Computational Sciences)

- Developed an **LLM agent system** with **LangChain** for natural language querying and analysis of large-scale PRISM cell-line screening datasets.
- Trained ML models (LightGBM, Transformer Attention Networks) to predict **drug dose-response** from gene expression and cell line embeddings.
- Utilized **SHAP** for model interpretability, gaining insights into drug potency and **mechanisms of action**.
- **Technical Skills:** LLM Agents, LangChain, Deep Learning, Transformers, PyTorch, LightGBM, SHAP

### Machine Learning & Bioinformatics Researcher

Jun 2022 - Current

UC San Diego Bafna Lab

- Developed **Computer Vision** Models for FISH (Fluorescence in Situ Hybridization) Spatial Transcriptomics Data.
- Predicts **tumor amplification status** (ecDNA/HSR) in Cancer Cell Lines and Patient Tissue Images.
- **Technical Skills:** Tensorflow, OpenCV, Numpy, Pandas, Python, Linux, Git.
- Web development for [AmpliconRepository](#), a Public Web Database of Oncogene Amplifications using NGS data.
- **Technical Skills:** Cloud Computing, Statistical Analysis, Database querying using MongoDB and Python's SQLite3.

### Computational Biology & Machine Learning Research Assistant

Oct 2021 - Jun 2023

UC San Diego Yeo Lab

- Built a **Convolutional Neural Network** for Spatial Transcriptomics Image data, to perform **nuclear segmentation**.
- Used a **U-Net Architecture** to predict nuclei boundaries, bypassing the need for DAPI staining.
- **Technical Skills:** Tensorflow, Keras, NumPy, Pandas, Pytorch, PyLab, Python, Linux, Git.

### Software Engineering Intern

Jun 2021 - Aug 2021

Dotdash

- Designed front-end software for Dotdash, the largest digital publisher in the US, managing sites like Investopedia and Verywell Health.
- Developed cross-platform web applications in a collaborative environment using Agile/Scrum.
- **Technical Skills:** JavaScript, Vue, HTML, SASS, Maven, Database querying, APIs.

### Phage Genomics Research Initiative

Oct 2020 - Jun 2021

UC San Diego Pogliano Lab

- Created a [BLAST parser website](#) using Google App Engine and Python ([GitHub](#)), used by the UCSD professor and class.
- Queries the NCBI BLAST data to perform comparative genomic analysis of Bacteriophage genes with unknown functions.
- **Technical Skills:** Flask, Python, HTML, Google Cloud App Engine.

## Journal Publications

Rajkumar\*, Prasad\*, et al., Accurate Prediction of ecDNA in Interphase Cancer Cells using Deep Neural Networks.

*bioRxiv Preprint*, <https://doi.org/10.1101/2025.06.23.661188> (Co-First Author Publication)

Wang et al. (2025), EvidenceBench: A Benchmark for Extracting Evidence from Biomedical Papers.

*arXiv Preprint*, <https://doi.org/10.48550/arXiv.2504.18736>

Luebeck et al. (2025), AmpliconSuite enables discovery of extrachromosomal DNA in tumor genomes.

*American Association for Cancer Research*, <https://doi.org/10.1158/1538-7445.AM2025-3755>

Dehkordi et al. (2025), Breakage fusion bridge cycles drive high oncogene number with moderate intratumoural heterogeneity.  
*Nature Communications*, <https://doi.org/10.1038/s41467-025-56670-8>

Lv et al. (2025), Spatial-Temporal Diversity of Extrachromosomal DNA Shapes Urothelial Carcinoma Evolution and Tumor-Immune Microenvironment.  
*Cancer Discovery*, <https://doi.org/10.1158/2159-8290.CD-24-1532>

Luebeck et al. (2024), AmpliconSuite: Analyzing focal amplifications in cancer genomes.  
*Cancer Genetics*, <https://doi.org/10.1016/j.cancergen.2024.08.015>

Mah et al. (2024), Bento: A toolkit for subcellular analysis of spatial transcriptomics data.  
*Genome Biology*, <https://doi.org/10.1186/s13059-024-03217-7>

Chapman et al. (2023), Circular extrachromosomal DNA promotes inter- and intratumoral heterogeneity in high-risk medulloblastoma.  
*Nature Genetics*, <https://doi.org/10.1038/s41588-023-01551-3>

Prichard et al. (2023), Identifying the core genome of the nucleus-forming bacteriophage family and characterization of Erwinia phage RAY.  
*Cell Reports*, <https://doi.org/10.1016/j.celrep.2023.112432>

## Achievements

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|------------|--|--|
| June 2025  | <b>NSF Graduate Research Fellowship</b> , Awarded for Outstanding Achievement in Bioinformatics Research | <i>National Science Foundation (NSF)</i> |
| Oct 2024   | <b>Cancer Grand Challenge eDynamic Conference</b> , Presented a Computer Vision Model for Cancer Imaging | <i>Cancer Grand Challenge (NCI)</i>      |
| Oct 2024   | <b>Cancer Grand Challenge Future Leaders Speaker</b> , Presented on AI applications in Cancer Research   | <i>Cancer Grand Challenge (NCI)</i>      |
| June 2023  | <b>Summa Cum Laude Honors</b> , Awarded for Exceptional GPA.   | <i>UC San Diego</i>                      |
| April 2023 | <b>Undergraduate Research Conference</b> , Presented on Computer Vision methods for FISH Imaging.        | <i>UC San Diego</i>                      |
| Jul 2020   | <b>UCSD BioScholars Honors Society Member</b> , Awarded membership based on academic achievement.        | <i>UC San Diego</i>                      |

## Skills


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|-------------------------|--|
| <b>Bioinformatics</b>   | Research Focus in <b>Cancer Genomics</b> : Mechanisms and Modeling of Tumor Resistance.                                    |
| <b>Machine Learning</b> | Experience With <b>Transformer Architectures</b> , <b>Convolutional Neural Networks</b> , and <b>ResNet Autoencoders</b> . |
| <b>Programming</b>      | Python (PyTorch, Tensorflow, Keras, Pandas, NumPy), R, C++, Cloud Computing, Bash, Linux, Git, JavaScript, Java, SQL.      |

## Mentoring

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|-------------|--|---------------------|
| 2023 - 2024 | <b>Data Science Capstone Mentor</b> , Mentored 3 Data Science undergrads in a Computer Vision capstone competition to semantically segment cell imaging data using deep learning.                | <i>UC San Diego</i> |
| 2023 - 2024 | <b>Early Research Scholars Program Mentor</b> , Mentored 2 Computer Science undergrads in a project to extract mutational signatures from The Cancer Genome Atlas (TCGA) genome sequencing data. | <i>UC San Diego</i> |

## Personal Projects


### Autotune Implementation Using Phase Vocoder

 [github.com/GinoP123/AutotunePV.git](https://github.com/GinoP123/AutotunePV.git)

May 2023

- Created an autotuner from scratch using Phase Vocoders and Yin pitch prediction.
- Able to autotune any audio clip to a specific major or minor scale using Hann window functions.
- Examples of popular songs autotuned [here](#).

### Custom Search Engine for Linux File System

 [github.com/GinoP123/FileSearch](https://github.com/GinoP123/FileSearch)

Jul 2022

- Created a keyword-matching search engine with caching fully from scratch using dynamic programming.
- Added learning capability by including popularity and relevance weights.
- I personally use this tool all the time, and find it a huge time-saver for navigating in Linux.