

# Gino Prasad

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Machine Learning | Computer Vision | Bioinformatics | Web & Full Stack Development | Data Science

## Education

### PhD, Computer Science: UC San Diego

Summer 2023 - Spring 2027

Advised by Vineet Bafna

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

Fall 2020 - Spring 2023 (expected)

Majoring in Bioinformatics (B.S.), Minor in Computer Science

GPA 3.97/4.0

- **Relevant Courses:** Data Structures; Algorithms; Convex Optimization; Databases; Linear Algebra; Multivariable Calculus; Bioinformatics Lab

## Experience

### Computer Science Research Assistant

Jun 2022 - Current

UCSD Bafna Computer Science Lab

- Developed **Image Processing and Computer Vision** Tools for smFISH(Fluorescence in Situ Hybridization) Image Data
- **Technical Skills:** Python with Tensorflow, OpenCV, Numpy, Pandas, Linux, Git
- Web development for [AmpliconRepository](#), an ecDNA(extra-chromosomal DNA) Public Web Database.
- **Technical Skills:** MongoDB and Django for web framework, querying functionality using Python's SQLite3.

### Machine Learning Research Assistant

Jun 2022 - Current

UCSD Yeo Bioinformatics Lab

- Built a **Convolutional Neural Network** for Spatial Transcriptomics Bioinformatics data.
- Uses **U-Net Architecture** and performs nuclear **semantic segmentation** without need for DAPI staining.
- **Technical Skills:** Python with Tensorflow, Keras, NumPy, Pandas, Pytorch, PyLab, Linux, Git.

### Computational Research Assistant

Oct 2021 - Jun 2022

UCSD Yeo Bioinformatics Lab

- Developed computational applications for **long-read Oxford Nanopore Sequencing Data** analysis.
- Created Error Correction Pipeline for **RNA-seq Analysis** using [Nanorevisor Deep Learning](#) Library.
- **Technical Skills:** Python, Bash, STAR, Minimap2, Samtools, Linux, Pandas.

### 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

- Created a [BLAST parser website](#) using Google App Engine and Python ([GitHub](#)), used by the UCSD professor and class.
- **Technical Skills:** Flask, Python, HTML, Google Cloud App Engine.

## Journal Publications

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>

Chapman et al., Circular extrachromosomal DNA promotes inter- and intratumoral heterogeneity in high-risk medulloblastoma.  
**Submitted to Nature Genetics, 2023**

Mah et al., Bento: A toolkit for subcellular analysis of spatial transcriptomics data.  
**Submitted to Nature Methods, 2023**

Rajkumar and Prasad et al., Computer Vision Analysis of Oncogene Amplification in Interphase Cells.  
**In preparation, 2023**

Dehkordi et al., OM2BFB: Detecting and elucidating Breakage Fusion Bridge structures in cancer genomes using Optical Mapping data.  
**In preparation, 2023**

## Skills

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<b>Programming</b>	Python (Tensorflow, Keras, PyTorch, Pandas, NumPy), R, C++, Bash, JavaScript, Java, HTML/CSS, SQL.
<b>Machine Learning</b>	Experience With <b>Multilayer Neural Networks</b> , <b>Convolutional Neural Networks</b> , and <b>ResNet Autoencoders</b> .
<b>Web Development</b>	Developed applications with MongoDB, Django, Flask, Vue, and Google Cloud App Engine.

## Achievements

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April 2023	<b>Undergraduate Research Conference Presenter</b> , Presented on Image Processing with FISH Imaging.	<i>UC San Diego</i>
May 2022	<b>Muir Caledonian Honors Society Member</b> , Awarded for Exceptional GPA.	<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>
2020-2022	<b>UCSD Provost Honors</b> , Awarded for Exceptional GPA.	<i>UC San Diego</i>

## Personal Projects

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### 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 Vocoder 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.