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*

Majoring in Bioinformatics (B.S.), Minoring 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.
Accepted for Publication 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

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

Achievements

June 2023	**Summa Cum Laude Honors,** Awarded for Exceptional GPA.	*UC San Diego*
April 2023	**Undergraduate Research Conference Presenter,** Presented on Image Processing with FISH Imaging.	*UC San Diego*
May 2022	**Muir Caledonian Honors Society Member,** Awarded for Exceptional GPA.	*UC San Diego*
Jul 2020	**UCSD BioScholars Honors Society Member,** Awarded membership based on academic achievement.	*UC San Diego*
2020-2022	**UCSD Provost Honors,** Awarded for Exceptional GPA.	*UC San Diego*

Personal Projects

Autotune Implementation Using Phase Vocoder

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 *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.