Gino Prasad

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Machine Learning | Bioinformatics | Computer Vision | Generative AI | Data Science

Education

PhD, Computer Science: UC San Diego *Summer 2023 - Spring 2027*

Academic Advisor: Vineet Bafna, Professor of Computer Science *GPA 4.0/4.0*

- **Relevant Courses:** Generative AI, Modeling of Large Language Models, Web Mining and Recommender Systems, Bioinformatics Algorithms

Bachelor of Science, Bioinformatics and Computer Science: UC San Diego *Fall 2020 - Spring 2023*

Major: Bioinformatics (B.S.), Minor: Computer Science *GPA 3.97/4.0*

- **Relevant Courses:** Deep Learning; Convex Optimization; Data Structures; Algorithms; Databases; Bioinformatics Lab

Experience

Applied Machine Learning Researcher *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 - Jun 2023*

UCSD School of Medicine

- 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

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**

Dehkordi et al. (2023), OM2BFB: Detecting and elucidating Breakage Fusion Bridge structures in cancer genomes using Optical Mapping data.
***bioRxiv*, https://doi.org/10.1101/2023.12.12.571349**

Lv et al., Spatial-Temporal Diversity of Extrachromosomal DNA Shapes Urothelial Carcinoma Evolution and Tumor-Immune Microenvironment.
Submitted to *Nature Genetics*

Rajkumar, Prasad et al., Accurate Prediction of ecDNA in Interphase Cancer Cells using Deep Neural Networks.
In Preparation (Co-First Author Publication)

Skills

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

Mentoring

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

Achievements

Oct 2024	**Cancer Grand Challenge Future Leaders Speaker,** Presenting a Computer Vision Model for Cancer Imaging	*Cancer Grand Challenge (NCI)*
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.