

Siddharth Sivalanka

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EDUCATION

University of California San Diego

La Jolla, CA

Bachelor of Science in Computer Science, Specialization in Bioinformatics

Sep. 2024 – June 2028

- **Courses:** Data Structures, Algorithms, Advanced Object Oriented Programming, Discrete Math, Probability and Statistics, Linear Algebra, Systems Programming, Computer Organization, Multivariable Calculus

TECHNICAL SKILLS

Languages: Java, Python, R, TypeScript/Javascript, HTML/CSS, SQL/NoSQL, Linux, Swift, C, C++

Frameworks: React, Node.js, CUDA, TensorFlow, PyTorch, OpenCV, FastAPI, Pandas, Flask, Docker

Specializations: Machine Learning, Bioinformatics, APIs, Microservices, Computer Vision, Data Analysis, Image Segmentation, Motion Planning, CI/CD, Cloud Infrastructure

EXPERIENCE

Software Engineering Intern

May 2025 – Present

Wild Genomics

La Jolla, CA

- Built Python bioinformatics pipeline processing airborne plant DNA with FASTQ/BLAST parsing and ONT barcode demultiplexing
- Developed TensorFlow species classification models achieving **9x higher accuracy** than traditional identification methods
- Created OpenCV geospatial analysis system mapping pest infestations across **1000+ acre** farmlands for precision agriculture

Research Assistant

April 2024 – Present

University of California San Diego

La Jolla, CA

- Analyzed **100K+** neural spike recordings from mouse hippocampus CA3/DG regions using Python statistical methods
- Co-developed custom microscope hardware and tracking firmware increasing signal-to-noise ratio by **2x factor**
- Processed calcium imaging data through ImageJ and Suite2P pipelines for behavioral neuroscience research

PROJECTS

TerraPulse | *Python, FastAPI, React, PostgreSQL, Docker*

- Built full-stack environmental monitoring platform with FastAPI backend and React frontend for real-time data visualization
- Implemented PostgreSQL database with time-series data storage for tracking environmental metrics across multiple sensors
- Containerized application with Docker for scalable deployment and integrated RESTful APIs for sensor data management

OpenLabel | *Python, Streamlit, TensorFlow, OpenCV (Diamond Hacks Winner)*

- Built AI-assisted data labeling platform with OpenCV image processing for object detection and TensorFlow confidence scoring
- Implemented computer vision pipelines using OpenCV for automatic bounding box generation and image annotation preprocessing
- Architected microservices design with Python Flask backend and Redis task queueing for concurrent labeling workflows

- Deployed Streamlit web interface enabling real-time collaboration for distributed annotation teams

NebulaDB | *C++, Data Structures, Database Internals, Memory Management*

- Engineered in-memory database engine with custom SQL parser supporting SELECT/INSERT/UPDATE/DELETE operations
- Implemented B+ tree indexing and hash table storage achieving sub-millisecond query response times
- Built ACID transaction system with deadlock detection and rollback mechanisms for data consistency

StudySync | *TypeScript, React, Node.js, Claude API*

- Built full-stack flashcard application with TypeScript type safety and React component architecture
- Integrated Claude API for intelligent quiz generation with rate limiting and Express.js RESTful backend
- Developed repetition algorithms with timer-based quiz modes for flashcard auto-generation

Mini Shell | *C, Linux, Systems Programming, POSIX Compliance*

- Developed POSIX-compliant shell with multi-process piping and I/O redirection using fork/exec system calls
- Implemented signal handling (SIGINT/SIGTSTP/SIGCHLD) with GNU Readline integration for tab completion and command history
- Built job control system supporting 100+ concurrent background processes with memory-safe operations