Garvit Agarwal

+1 858-588-3492 gagarwal@ucsd.edu linkedin.com/in/agarwalgarvit garvit192.github.io/Overview

Education

University Of California San Diego Expected Dec 2025

Bachelor of Science in Mathematics- Computer Science (GPA: 3.96 / 4.00, Provost Honors) *San Diego, CA*

- **Relevant Coursework:** Data Structures and Algorithms, Object Oriented Design, Systems Programming, Functional Programming, Numerical Optimization (Linear/Non-Linear Programming), Graph Theory, Operating Systems

Experience

Mesirov Lab Feb 2025 – Present

Software Engineer Intern *San Diego, CA*

- Delivered 3+ production-ready genomic analysis modules, integrating GATK into modular Python apps and accelerating analytical pipeline development.
- Containerized tools with Docker, improving reproducibility and cutting deployment setup time by 50%.
- Collaborated with a team of researchers and engineers to define requirements, streamline usability, and integrate tools into real-world genomic workflows.

Qualcomm Institute- UC San Diego Jan 2024 – Jun 2024

Software Engineer Intern *San Diego, CA*

- Built a real-time Virtual Reality (VR) "digital twin" of the UCSD Campus in Unreal Engine 5 for live weather and congestion visualization for research and planning purposes.
- Contributed to the design and implementation of custom 3D modeling tools, reducing manual modeling time by 50% and significantly accelerating high-fidelity content creation.
- Automated data ingestion via Python-AWIPS and CouchDB, cutting API load by 30%.

Department of Defence Apr 2024 – Jun 2024

Innovation for National Security Intern *San Diego, CA*

- Proposed microgrid control optimizations to cut contractor reliance and boost efficiency at MCAS Miramar.
- Led 24+ stakeholder interviews with military personnel, engineers, and academics to surface cybersecurity, and scalability issues in microgrid control systems, directly informing modernization requirements and solution design.

Teaching and Learning Commons/ Department of Mathematics- UC San Diego Sep 2023 – Jun 2025

Undergraduate Mathematics Tutor *San Diego, CA*

- Tutored 100+ undergraduates in Calculus, Linear Algebra, and Discrete Math with a CRLA Level 1 certification.
- Adapted teaching approaches to diverse learning styles, increasing engagement and comprehension.

Projects

Convex Optimization API | *Python, CvxPy, FastAPI, Docker, AWS*

- Architected a production-ready FastAPI backend with modular API versioning, CORS middleware, and token-based authentication to securely expose convex optimization solvers.
- Developed a dedicated solver service layer using cvxpy for LP/QP problems, with structured Pydantic models for input validation and JSON output compliance.
- Prepared for cloud deployment with AWS-ready configurations, environment variable management via pydantic-settings, and automated test scaffolding using pytest.

Custom Functional Programming Language | *Haskell*

- Built a minimalist functional programming language in Haskell with a combinator-based parser, partial evaluation engine, and REPL for interactive program execution.
- Applied compiler theory concepts — AST design, Hindley-Milner type inference, and pattern matching — to deliver a fully working interpreter in a 3-person team.

Technical Skills

Languages: Python, C++, C, Java, JavaScript, MATLAB
Technologies and tools: UnrealEngine 5, CouchDB, Python-AWIPS, Github, MongoDB, Mongoose, Visual Studio Code, Microsoft Office, GATK, SciKit-learn
Concepts: Cryptography, RESTful APIs, Database Normalization, Data Structures and Algorithms, Recommender Systems, Unit Testing, Linear/Non-Linear Optimization, Programming Languages, Parsers