Arjun Damerla

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OBJECTIVE: Applying my skills in networking, scalability, large language models, and reinforcement learning to create products, solutions, and optimized performances that drive both local and global change.

EDUCATION

University of California, Berkeley.   Graduation Date: December 2024
- Double Major in Computer Science and Applied Mathematics.
- *Relevant Coursework*: Data Structures and Algorithms, Machine Learning, Real and Complex Analysis, Abstract Algebra, Computer Graphics, Computer Security, Database Systems, Computer Architecture

EXPERIENCE

Algoverse AI Research   Los Angeles, CA
Machine Learning Research Mentor   *2024-2025*
- *Working on and mentoring several research ML projects, analogous to the role of a PhD student at a university lab, with the goal of publishing at top AI conferences, such as NeurIPS, COLM, and ICML.*
- *Teaching undergraduates and high-schoolers the fundamentals of machine learning, transformers, large language models, and natural language processing.*
- *Hosting weekly meetings with project teams, guiding them through reasoning about different research ideas, and later instructing on how to implement the project.*

Computer Networking (CS168)   Berkeley, CA
Course Head Teaching Assistant   *2024-2025*
- *An introduction to Internet architecture, analyzing fundamental concepts that contribute to the Internet's scalability/robustness, while also surveying the various protocols and algorithms used within this architecture.*
- *Updated and optimized course project infrastructure with the POX networking software platform, and added better debugging frameworks for students, ensuring a robust and scalable environment for hands-on learning.*
- *Along with discussions and office hours, dealt with handling course logistics, facilitating staff meetings, shaping course content and topics, and constructing midterm and final.*

Introduction to Artificial Intelligence (CS188)   Berkeley, CA
Course Head Teaching Assistant and Course Reader   *2024*
- *An introduction to ideas and techniques underlying the design of intelligent computer systems, delving into topics such as control satisfaction problems, Markov Decision Processes, reinforcement learning, and machine learning.*
- *Setup and preserved course project infrastructure, including maintaining a robust Conda-based workflow, which simplified dependency management and ensured reliable and consistent machine setups for students.*
- *Helped streamline PyTorch dependency management for the course Neural Network project, and resolved PyTorch-related issues for students, such as version conflicts and GPU compatibility.*
- *Held group discussions and office hours, also dealt with handling course logistics, facilitating staff meetings, shaping course content and topics, and helping with disabled students' accommodations.*

Discrete Mathematics and Probability Theory (CS70)   Berkeley, CA
Course Teaching Assistant and Course Reader   *2023*
- *An introduction to theory-oriented topics like logic, set theory, graph theory, modular arithmetic, error correcting codes, Markov Chains, discrete/continuous probability, countability, and computability.*
- *Facilitated discussions, assisted students during office hours and on class forums, created homework and exam content, and recorded walkthrough videos for quizzes.*

UC Berkeley East Asian Library   Berkeley, CA
Student Library Worker   *2022 - 2024*
- *Efficiently organizing and shelving books to optimize ease of access. Proficient in providing customer service at the front desk, assisting patrons with potential research inquiries and facilitating smooth library experiences.*

Research for JIPCAD   Berkeley, CA
Undergraduate Research Apprentice Program   *2024*
- *3D modeling software specializing in creating complex geometric shapes such as Möbius Strips and Klein bottles.*
- *Helped model shapes and improved software to allow for the modelling of these complex shapes to be simpler.*
- *Helped build a native iOS app in Swift using SwiftUI and Combine that fetches and displays JIPCAD data.*

PROJECTS

ARTEMIS: Ray Tracer and Marcher for Point Clouds (C++, Swift, and OpenCL)   *2024*
- Awarded **first place** out of 80 competing groups for outstanding graphics project. Demonstrated exceptional skills in design, creativity, and technical execution.
- Developed an **interactive flocking particle simulation** that forms point clouds generated by a text-to-3D model.
- Built the project from scratch using a barebones OpenCL sample, implementing **GPU-accelerated** ray marching and ray tracing for rendering.

NovaED: Education Tech Tool for Biology and Chemistry Professors   *2024-2025*
- **AI-powered** educational platform designed for biology/chemistry professors to generate practice questions.
- Integrated a **large language model** to analyze professors' lecture notes and slides, automatically producing multiple-choice, free-response, and essay questions relevant to the lecture content.
- Developed a **user-friendly interface** for students to test themselves based on the generated questions, while also providing immediate feedback on performance in order to maximize learning.

Central Processing Unit Design (Logisim and C)   *2023*
- Created and simulated entire CPU using many simulated digital circuits and logic units
- Integrated various CPU components including the ALU, registers, control unit, and memory interface.

File and Version Control System - Git Simulator (Java)   *2022*
- Developed a version-control system to efficiently manage and organize files and folders
- Implemented all standard Git commands including adding, committing, fetching, pushing, and more.

LEADERSHIP EXPERIENCE

Berkeley Math Tournament   *August 2021 - Present*
Head Problem Writer and Test Organizer
- Wrote problems for multiple math exams and organized the tournament for 2,000+ high schoolers and middle schoolers from the US and China.
- Led problem-writing meetings, handled tournament-day logistics, and hosted socials for members.

Computer Science Undergraduate Association   January 2024 - Present
Officer
- Held general computer science office hours and organized social and outreach events

SKILLS AND INTERESTS

Programming Languages and Systems: C++, Objective-C, Python, Swift, Java, C, TypeScript, SQL, MongoDB, Pytorch, OpenCL
Interests: Differential Topology, Neural Networks, Computability, Large Language Models, Galois Theory