Caden Roberts

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Education

University of California, Santa Cruz — Santa Cruz, CA
MS in Computer Science & Engineering, BS in Computer Engineering — *Sep. 2025 – Jun. 2026 | Aug. 2023 – Jun. 2025*

West Valley College — Saratoga, CA
Honors Program, AS for Transfer in Mathematics, AA in Liberal Arts: Math & Sci — *Aug. 2021 – Jun 2023*

Graduate Coursework: *Machine Learning, Neural Computation, Artificial Intelligence, Projects in Artificial Intelligence, Ind. Research, Analysis of Algorithms, Computer Architecture, Database Systems, Storage Systems, VLSI Digital System Design*

Relevant Undergraduate Coursework: *Data Structures and Algorithms, Computer Architecture, Embedded System Design, Computer System Design, Engineering Design Project I/II, Full Stack Web Development, Python Programming, C Programming, C++ Programming I/II, Computer Networks, Assembly Language, Logic Design, Electronic Circuits, Signals and Systems*

Experience

Machine Learning Researcher — Jul. 2025 – Present
University of California, Santa Cruz — *Santa Cruz, CA*

- Developing **HelixNet**, a Coarse-Grained DNA-protein SchNet model with Graph Neural Networks.
- Generated OpenMM Ground Truth dataset with WESTPA and the WESTPA CG model runs on NERSC A100 GPUs.
- Evaluated sampling efficiency, RMSD, and step speed of WESTPA/CG model runs against WESTPA/OpenMM baselines.

Group Tutor and Grader — Jan. 2025 – Present
University of California, Santa Cruz — *Santa Cruz, CA*

- Tutoring 5-15 students / 5-hr session / 2x per week per class for Applied Discrete Mathematics and Python Programming.
- Grading exams of 200+ students for Python Programming.

Undergraduate Research Assistant — Jan. 2025 – Mar. 2025
University of California, Santa Cruz — *Santa Cruz, CA*

- Implemented custom FIFO, LIFO, and Round-Robin schedulers in Linux using sched_ext.
- Developed and evaluated custom scheduling policies for **Ecovisor**, an AI-driven framework leveraging cloud computing to select optimal software schedulers and improve energy efficiency at renewable energy plants.

Projects

CliniRepGen | *Python, PostgreSQL, Tongyi DeepResearch, RAG, AWS Bedrock, Supabase, Git LFS* — Sep. 2025 – Present

- Developing an automated pipeline to generate CONSORT/ICH E3–compliant drug clinical trial reports from structured and unstructured biomedical data.
- Using Tongyi DeepResearch via AWS Bedrock CMI and data from AACT Postgres, Drugs@FDA, and PMC OA/Citation Explorer with Python (scripts, pdfplumber/other libraries).
- Also using Git LFS and Supabase to store the AACT Postgres and Drugs@FDA data.

ClinImCL | *Google Cloud, PyTorch, MONAI, NIfTI, Scikit-learn* — Oct. 2025 – Present

- Developing a self-supervised contrastive framework to learn temporal representations from longitudinal MRI OASIS-3.
- Implementing a MONAI-based preprocessing pipeline for NIfTI standardization and trained SimCLR-style encoders on Google Cloud A100 GPUs.

TheraHand | *Node.js, Express.js, React.js, PostgreSQL, ESP32C3, AWS EC2, OpenAPI, Swagger* — Jan. 2025 – Jun. 2025

- Led full-stack development of a physical therapy hand rehabilitation device which was deployed on AWS EC2.
- Built the Node.js–Express–React application with PostgreSQL to log and simulate progress and interface with ESP32C3.
- Defined and documented RESTful API endpoints through a complete OpenAPI specification.

Technical Skills

Languages: Python, C++, C, SQL, Bash, JavaScript, R, HTML/CSS, Verilog, RISC-V, MATLAB
Frameworks & Libraries: PyTorch, TensorFlow, MONAI, NumPy, Pandas, Scikit-learn, OpenMM, WESTPA, React.js, Node.js, Express.js
Tools & Platforms: Google Cloud, AWS, HPC (NERSC Perlmutter), CUDA, Docker, Slurm, PostgreSQL, Supabase, Jupyter, Git, VS Code, Xcode, Tableau, SolidWorks
APIs & Protocols: RESTful API Design, OpenAPI/Swagger, JSON, YAML

Certifications

Google Data Analytics Professional Certificate | *R, SQL, Tableau* — May 2024