

# Theo Rode

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## Work Experience

### UC Berkeley AUTOLab - Engineering Intern

May 2024 - present

- Investigating the applications of vision transformers and self-supervised methods for noisy label learning on large, real-world datasets.
- Enhancing novel 3D-vision techniques for articulated object tracking from RGB video for one-shot robot imitation.

### Caltech - Scientific Data Analyst

Nov 2023 - present

- Accelerating pipeline for processing 60+ GB of satellite data daily to extract fluorescence data accounting for less than 1% of background spectrum.
- Developing an expandable and modular codebase in Julia with multithreaded CPU or GPU-accelerated backbones.

### GrayMatter Robotics - AI Robotics Software Development Intern

Jun 2023 - Aug 2023

- Led development of a novel RGB vision system in C++, utilizing OpenCV and PCL, which integrated with ROS.
- Developed algorithms for processing point clouds to allow for AI to perceive colored sections of objects as distinct.
- Collaborated extensively with the hardware team to build new custom hardware.
- Worked with the applications team to architect a custom calibration system to allow for interoperability between an external tracking system and a robotic arm for precise (mm scale) sanding.

### Harvey Mudd College - Teaching Assistant

Aug 2023 - May 2024

- Served as a teaching assistant for Multivariable Calculus (MATH019) and Data Structures (CSCI070) offering weekly office hours and thorough feedback on assignments.
- Nominated by the head of the math department for a new role to write weekly exemplary solutions for the freshman multivariable calculus (MVC) class of over 200 students.

## Projects

### Automated Recovery of Dynamical Systems

Feb 2024 - May 2024

- Explored machine learning techniques from modern research papers and implemented from-scratch codebase in Julia.

### The Game of Gradients

Nov 2022 - Jan 2023

- Led team in creating a math-education game in Rust with live, interactive gradient field rendering.
- Currently being used by my high school MVC teacher as a teaching tool for his MVC class.

### Shark Attack Data Analysis

Nov 2022 - Dec 2022

- Analyzed heavily inconsistent data and compiled visual representations to effectively articulate trends using Julia.

### Rust Spotify API Wrapper

Aug 2022 - present

- Published open source library on Rust's Crates.io for simplified and robust interaction with the Spotify API.

## Education

### Harvey Mudd College

2022 - 2026

- Rising junior pursuing degrees in Computer Science and Math. Major GPA: 4.0. Overall GPA: 3.98.
- Notable past coursework: Data Structures & Program Development (CSCI070), Dynamical Systems (MATH181), Abstract Algebra (MATH171), Probability & Statistics (MATH062), Mathematical Analysis (MATH131), Differential Equations (MATH082), Advanced Linear Algebra (MATH173), Discrete Math (MATH055), Principles & Practice: Computer Science (CSCI042), Engineering Systems (ENGR079).
- Upcoming coursework: Computability and Logic (CSCI081), Computer Systems (CSCI105), Math Methods in Data Science (MATH177), Network Science (MATH189AI)

### The Nueva High School

2018 - 2022

- Notable coursework: Quantum Information and Computation, Algorithms, Computer Security, Computer Vision, Intro and Advanced Machine Learning, Graph Theory, Cryptocurrency.

## Skills

- Programming languages: Rust, C++, Julia, Python, R, Racket, JavaScript, TypeScript, MATLAB, HTML, CSS
- Tools and platforms: OpenCV, PCL (Point Cloud Library), PyTorch, ROS (Robot Operating System), git, Linux, Pandas, Leptos, Yew, Unreal Engine, Bevy, React Native
- Technical skills: computer vision, data analytics, computer simulation, and machine learning.
- Soft skills: leadership, teaching, and teamwork

## Awards

- The Courtney S. Coleman Prize, 2024:** Awarded by Harvey Mudd to rising junior students who excel in mathematics.