

# Theo Rode

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## Work Experience

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- GrayMatter Robotics - AI Robotics Software Development Intern** Jun 2023 - Aug 2023
- Took lead on developing 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 the custom hardware necessary to integrate the new vision system into the current product.
  - 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 - Multivariable Calculus (MATH019) Teaching Assistant** Aug 2023 - present
- Nominated by the head of the math department for a new role to write weekly exemplary solutions for the freshman MVC class of over 200 students.
  - Collaborating with professors and other graders to provide detailed feedback to students.
- Harvey Mudd College - Homework Hotline Tutor** Sep 2022 - present
- Provide homework help through a free call-in tutoring service for kids from elementary to high school.

## Projects

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- The Game of Gradients** Nov 2022 - Jan 2023
- Led a small team in creating a game in Rust that builds intuition for a gradient field.
  - Designed a real-time gradient field simulation that updates live with user defined functions.
  - 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
- Formatted heavily inconsistent and non-standardized data on shark attacks.
  - Analyzed data to extract patterns and correlations using Julia.
  - Compiled visual demonstrations of the data to effectively articulate trends.
- Rust Spotify API Wrapper** Aug 2022 - Jun 2023
- Developed an intuitive library structure as a wrapper for the Spotify Web API in Rust.
  - Implemented the PKCE extension for OAuth2 authorization with the API.
  - Uploaded as an open source library to Rust's Crates.io package marketplace.
- The Three Body Problem Simulation** Nov 2021 - Dec 2021
- Built a simulation engine for the Three Body problem: modeling the chaotic motion of three gravitational bodies.
  - Collaborated with a group to improve accuracy and dependability of the simulation.
- Music Recommendation Engine** Jan 2021 - Apr 2021
- Built a machine learning model with TensorFlow to predict if a song will be enjoyed.
  - Constructed a desktop application to view the model's predictions and train it.

## Education

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- Harvey Mudd College** 2022 - 2026
- Sophomore pursuing degrees in Computer Science and Math. Current GPA: 4.0.
  - Current coursework: Data Structures & Program Development (CSCI070), Mathematical Analysis (MATH131), Differential Equations (MATH082), Engineering Systems (ENGRO79), Physics Lab (PHYS050), Pacific Islander History (ASAM126).
  - Notable past coursework: Adv. Linear Algebra (MATH173), Discrete Math (MATH055), Principles & Practice: Computer Science (CSCI042)
- 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

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

## Hobbies

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I love playing tennis and skiing. I also enjoy sleight of hand magic and solving puzzles.