

# Nicholas Tang

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[Portfolio](#) — [GitHub](#) — [LinkedIn](#)

## Summary

Embedded firmware engineer with hands-on experience developing safety-critical systems in C/C++ for electric vehicles. Built STM32 firmware for PID-based traction control and regenerative braking, with robust communication over CAN and UART. Strong focus on low-level systems, real-time constraints, and hardware-software integration.

## Education

<b>UC Santa Cruz</b>	Sept 2024 – Jun 2027
B.S. Computer Science, EE Minor	GPA: 3.95

## Experience

<b>Formula Slug (Formula Society of Automotive Engineers) @ UC Santa Cruz</b>	Sept 2024 – Present
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*Firmware Engineer* (C++)

- Developing firmware for a custom electric vehicle for the FSAE international collegiate competition.
- Implemented automatic lap counting using GPS data from CAN bus with accuracy of  $\pm 10$  meters.
- Managed 10 MHz UART communication with VN-200 for performant IMU and GPS data acquisition.
- Developed firmware for regenerative braking and PID-based traction control on STM32 MCUs.
- Utilized MbedOS RTOS, CMake, and Ninja for building and flashing to ARM-Cortex M cores.
- Engineered safety-critical power delivery systems, implementing LV undervolting detection and relay actuation.

<b>UCSC Earth and Planetary Sciences</b>	Jun 2025 – Present
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*Planetary Cloud Tracking Research* (C/C++)

- Exploring computer vision algorithms to track wind patterns on Jupiter and other planetary atmospheres.
- Exposure to and translation between HDF5, NetCDF, TIFF, other various file formats
- Using CMake to manage complex, large-scale projects
- Implementing image/signal processing algorithms in C
- Solving Euler-Lagrange equations with numerical integration

## Projects & Other Experience

<b>NASA's Professional Development Program (NPWEE)</b>	June 2025 – Aug 2025
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*Lead Systems Engineer*

- Worked on mid-air battery swap infrastructure for electric planes.
- Spearheaded design and writing for the final proposal of 7 pages.
- Researched airspace management and aviation systems; workforce development program.
- Collaborated on a team of 12.

<b>Musical Auto-Transcribe DSP</b>	Dec 2025 – Present
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- Turns audio files into human readable musical notation
- Applying FFT algorithms, Hann windowing, and general signal denoising

<b>WindowWise — ACMHacks</b> (Node.js, Python)	Oct 2024
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- Enables passive cooling systems instead of HVAC by solving heat equation
- Optimizes climate control while reducing energy waste by 100%.

<b>Three-Body Problem Simulator</b> (Python)	2025
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- Built a numerical physics engine simulating gravitational interactions of three bodies in 2D.
- Implemented ODE solvers and visualization of orbital trajectories.

## Leadership & Activities

**Formula Slug** — Software + Firmware Engineering Member

**Association for Computing Machinery (ACM)** — Member

**Google Developer Groups on Campus** — Former Instruction Officer, Workshop Organizer

## Skills

<b>Languages:</b>	C/C++, Python, Java, MATLAB, Node.js, Bash
<b>Embedded/HW:</b>	RTOS (MbedOS), STM32, CAN bus, UART, SPI, KiCad, Oscilloscopes
<b>Tools/DevOps:</b>	Git, CMake, Ninja, Docker, Valgrind, GNU Make, GDB, Vim
<b>Math/Theory:</b>	DSP, FFT, Numerical Integration, ODE Solvers, PID Control
<b>AI/Productivity:</b>	LLM Prompt Engineering (Copilot, Gemini, Grok), Technical Documentation