# Arnauld Martinez

arnauldmartinez@caltech.edu | arnauldmartinez.github.io | linkedin.com/in/arnauldmartinez

## Education

**California Institute of Technology**, B.S. in Computer Science, ML track — Jun 2025 – June 2026

- GPA: 4.1/4.0
- **Coursework:** Learning Systems, Data Mining, Algorithms, Theory of Computation, Differential Equations, Classic and Quantum Mechanics, Probability and Inferential Statistics, Operating Systems
- **Languages:** Python, Java, OCaml, C, C++, Assembly

## Experience

**Software Engineer Intern**, SpaceX – Redmond, WA — Jun 2025 – Sep 2025

- Currently working on building an end-to-end model that enables Starlink satellite service in severe solar storms.
- The service will allow users to stay connected even when satellite payloads are not Earth-normal.

**Software Engineer Intern**, SpaceX – Redmond, WA — Jun 2024 – Sep 2024

- Built a physics simulation in C++ to capture and propagate the physical state of Starlink satellites. Verified the simulation's accuracy against real-time telemetry data.
- Developed models for on-board battery and antenna states, with the ability to bootstrap to a future time and simulate numerous failure modes.
- The engine is currently being used by SpaceX to test satellite vehicle updates on the ground before deploying into production.

**Control and Dynamics Research Fellow**, Caltech – Pasadena, CA — Jun 2023 – Aug 2023

- Worked under Professor Soon-Jo Chung to build a physics simulation modeling spacecraft kinematics and actuator systems as Markov Decision Problems.
- Integrated the physics engine into existing fault detection algorithms to isolate faulty reaction wheels and sensors onboard spacecraft.
- Developed a neural network to convert RGB images from the spacecraft's cameras to infrared images, capable of removing hot pixels and solar glare.

## Projects

**Autonomous F1 Car** [link]

- Designed and built a Soft Actor-Critic network to control an F1 car and optimize its path on an untrained track in Python.
- Current implementation can complete a modified version of the Spanish Grand Prix in 1:15:490, while Lando Norris holds the record at 1:11:383.

**Robot Arm for Chess** [link]

- Built a custom robot arm capable of playing chess against a user in real-time.
- Developed a machine learning model to capture and serialize the state of the chess board using an on-board camera. Integrated a 3200-rated chess engine, capable of beating the best human chess player: Magnus Carlsen.

**Project Global** 2020

- Designed and 3D-printed over 6,000 face shields for frontline workers during the Coronavirus pandemic.
- Organized a free math tutoring program throughout Southern California to reach students who could not afford tutors.

## Honors + Awards

- **Vice President of Lloyd Undergraduate House**: Lead house events, create/manage house website, represent undergraduate students before Caltech administration.
- **US National Chemistry Olympiad Qualifier:** Scored in the top 1,000 out of 20,000+ students.
- **American Invitational Math Exam Qualifier:** Scored in the top 2.5% out of 300,000+ students.