

Gavin Hua

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EDUCATION

California Institute of Technology, Pasadena, CA

Expected Jun. 2027

Expected Majors: Electrical Engineering and Computer Science

Beijing No. 4 High School International Campus

Graduated Jun. 2023

Cumulative GPA: 4.60/4.61

TECHNICAL SKILLS

Intermediate: Python, C/C++, Altium Designer, LaTeX

Basic: MATLAB, SOLIDWORKS, Java

RELEVANT EXPERIENCES

Independent Project, CMatrix: C-based Linear Algebra Library

Jun. 2023 - present

Created a fully documented linear algebra library in C based on the language's standard libraries. Current functions include memory allocation/deallocation for matrices and vectors, basic operations such as determinants, inverses, and basis transforms, as well as geometric and algebraic functions such as attitude descriptions and matrix decompositions.

Member, Formula SAE

Sep. 2023 - present

Designed a PCB in Altium Designer to pedal potentiometer data and transmit results via the CAN bus. Currently designing a multithreaded telemetry system using an ESP32 with C++ to concurrently transmit vehicle information to the ground control station over Wi-Fi.

Member, Caltech Air and Outer Space (CAOS)

Sep. 2023 - present

Designed a motor controller breakout PCB for the CRATER rover project in Altium Designer. Used signal multiplexing and ADC to facilitate communications between the motors, drivers, and the central controller over I2C.

Independent Project, Acceleration-based Braking Lights

Jul. 2023 - present

Designed braking lights that vary in brightness depending on the vehicle's deceleration. Coded an MPU 6050 accelerometer/gyroscope and an Arduino in C++ to detect vehicle deceleration and integrate vehicle attitude changes to automatically calibrate for gravity.

Independent Research, Dynamics Analysis of Rebounding Irregular Objects

Apr. 2022 - Sep. 2022

Developed theory based on a mass-spring model to characterize the effects of initial vertical speed, angular speed, surface characteristics, and impact angle on the rebounding behavior of irregular objects. Designed and constructed an electromagnet experiment apparatus. Programmed a video processing utility using Python and the OpenCV library to automate kinematics data analysis for over three hundred videos.

Programming Lead, FIRST Robotics Contest, Team 7591

May. 2021 - Jul. 2022

Coded and assembled a 4-wheel swerve drive for the competition using vector algebra and PID control in Java. Integrated an Arduino-based collision warning and aversion system with ultrasonic sensors in C++.