

# Garrett Knuf

Highly motivated Caltech undergraduate with a versatile skill set, pursuing 2024 internship opportunities related to electrical engineering.

## EDUCATION

### **California Institute of Technology** - *B.S. Electrical Engineering*

September 2021 - June 2025 / Pasadena, CA

4.0 GPA; Completed coursework in circuit design and prototyping, embedded systems, digital logic, and computer engineering; Upcoming coursework in analog electronics, operating systems, and feedback and control circuits

## EXPERIENCE

### **Caltech Mixed-mode Integrated Circuits and Systems Lab**

*Undergraduate Researcher* | Starting September 2023 / Pasadena, CA

Integration of ASIC and RF microcontroller for biomedical applications; Implementation of I2C and Bluetooth communication protocols; Anticipated PCB design and FPGA programming for hardware bring-up

### **Honeybee Robotics** - *Software Engineering Intern*

June 2023 - Present / Altadena, CA

Developed flight software for sample acquisition system on NASA's Dragonfly mission; Embedded software development and testing in C; Implemented state machine driven components with RTEMS; Designed various hardware emulators and test scripts to verify packet transfer and synchronization

### **NASA Jet Propulsion Laboratory** - *Undergraduate Researcher*

June 2022 - August 2022 / La Cañada Flintridge, CA

Created testbed for multipath channel sounding experimentation; Signal processing and experimentation with spacecraft Doppler effects; Designed payload for unmanned aerial vehicle with Linux-based software defined radios

### **Idea Lab Kids** - *Electronics Intern*

June 2021 - August 2021 / Virtual

Designed projects for students (K-8) to learn about robotics; Circuit design and coding with Arduino; Developed miniature Arduino smart home; Created 30+ lesson plans and performed Q&A on 50+ lessons

## CLUBS AND ACTIVITIES

### **Caltech Racing** - *Electrical Team Member*

September 2022 - Present / Pasadena, CA

Designed dashboard electronics to process driver controls of Formula SAE competition car; Schematic capture and PCB design in Altium; Processing of digital and analog sensor inputs to communicate with low voltage systems via CAN bus; Currently designing hardware for custom TFT display driver

### **FIRST Robotics Team 5199** - *Subsystem Lead and Mentor*

September 2017 - Present / Mission Viejo, CA

Designed shooting, climbing, and intake mechanisms for FIRST Robotics competition (2017- 2021); Electrical team co-lead; Competed in World Championship in 2018 and 2019; Currently volunteering as a mentor

Please visit [garrettknuf.github.io/portfolio](https://garrettknuf.github.io/portfolio) to see project details

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## TECHNICAL SKILLS

Altium Designer  
Spice Simulations  
Circuit Design  
Microprocessors  
C/C++  
Python  
Assembly language

## PROJECTS

### **Synthesizer Module**

Digital signal processing and controls with AVR MCU

### **AVR Assembly Binario**

Switches, encoders, speaker, EEPROM, and LED matrix

### **CPLD 8-bit CPU**

85 instruction CPU  
programmed with ABEL HDL

### **Ping Pong Ball LED Clock**

Arduino-controlled clock with LED strips and IR controls

## AWARDS

### **Academic All-District**

Caltech NCAA Baseball

### **Eagle Scout**

Boy Scouts of America

## INTERPERSONAL SKILLS

**Leadership** - National Youth Leadership Training graduate

**Collaboration** - values ideas of peers to boost team performance and success

**Communication** - ability to convey complex technical concepts in a clear manner

## REFERENCES

References available upon request.