Ray Sun

rayjhsun@gmail.com | raysun@caltech.edu
(909)-525-6506

https://electronictoast.github.io/
http://linkedin.com/in/ray-sun-2020
https://github.com/ElectronicToast

EXPERIENCE

MICRO-VU CORP. | Electrical Engineering Intern
Summer 2019 | Windsor, CA

- Supported electrical and FPGA (Verilog) development for precision non-contact and multi-sensor metrology machines.
- Designed and prototyped low-latency, fault-robust Bluetooth machine remote with STM32 and SiLabs Blue Gecko.

AMPAIRE INC. |Powertrain Intern
Summer 2018 | Los Angeles, CA

- Assembled and validated high voltage electric powertrain modules for ground testbed and flight aircraft.
- Assisted with development of Simulink model of powertrain.
- Designed and tested 15 Mbps isolated dual-channel CAN transceiver.

CALTECH | TechLab Student Assistant
April 2017 – September 2017 | Pasadena, CA

- Provided training to Caltech students and staff in using 3D printing resources.
- Maintained 3D printers and fulfilled print job requests.

RESEARCH

CALTECH MISSION OPERATIONS CENTER
Student Team Member
April 2019 – Present | Pasadena, CA

- Collaborating with JPL and University of Michigan on uplink/downlink operations and data analysis of CubeSat missions.
- Designing VHF/UHF groundstation for small satellite connunications and ops center on campus.
- Abstract submitted to 2020 CubeSat Developers' Workshop.

CALTECH AEROSPACE ROBOTICS AND CONTROL LAB
Undergraduate Researcher
September 2017 – March 2018 | Pasadena, CA

- Assisted in development for spacecraft simulator and UAV demonstrations.
- Designed STM32-based second-generation thruster controller boards.

Summer Undergraduate Research Fellow
Summer 2017 | Pasadena, CA

- Assisted development of a 6-DOF spacecraft simulator robot: assisted with hardware selection; performed thruster characterization; designed low-level thruster controller board.

EDUCATION

CALTECH | B.S. in Electrical Engineering
Expected June 2020 | Pasadena, CA • Cum. GPA: 4.2 / 4.3 • Major GPA: 4.1 / 4.3

SKILLS

HARDWARE

Design:
Arduino / AVR • STM32 / TI SimpleLink / ARM • Embedded wireless • Raspberry Pi • Xilinx FPGA
Tools:
Altium/CircuitMaker • KiCad • EAGLE • LTSpice • Inventor • SolidWorks
Fabrication:
3D printing • Laser cutting • Machining

OTHER

General class amateur radio license • GIMP • Control theory

PROGRAMMING

Languages:
C/C++ • Python • Linux • VHDL • Verilog • Assembly (AVR, ARM, x86)
Other:
ROS • MATLAB/Simulink • LaTeX

SPOKEN & WRITTEN

Fluent:
English
Elementary:
Chinese, German, Japanese

ACTIVITIES AND ORGANIZATIONS

IEEE: Chair of the Caltech IEEE student branch, leading committee organizing events for networking, outreach, and education.
Caltech Formula SAE Team : Designed temperature sensing board and high voltage sensing circuit for 2nd generation electric vehicle battery management system. Designed, verified, and integrated 3rd-generation STM32-based vehicle pedal sensors board; designed 4th generation board.
Team CoSTAR : Student member of Caltech DARPA Subterranean Challenge team, working on hybrid ground-aerial vehicle prototype avionics.
Hacktech : Organizer of intercollegiate hackathon; 3 years of involvement.
Tau Beta Pi : Member of engineering honor society, Secretary of Caltech chapter.

COURSEWORK

ELECTRICAL ENGINEERING

Advanced Digital System Design • FPGAs with VHDL • Analog Design Laboratory • Experimental Circuits Laboratory • Signal Processing • Circuit Analysis
Teaching Assistant
Advanced Embedded Systems • Embedded Systems • Mechatronics

ROBOTICS

Autonomy • Experimental Robotics • Electronics for Space Applications

COMPUTER SCIENCE

Machine Learning • Computing Systems • Algorithms

PERSONAL PROJECTS

Bifrost: Arduino Nano-based open source RGB LED controller with music visualization capabilities and Bluetooth.
Triumph: Accurate and robust analog function generator with sine, square, and triangle output
High Altitude Balloon: Stratosphere characterization with Arduino Due and sub-RF communications
Wearable Computer: Raspberry Pi-based wearable computer with custom transparent display
FireFly: Open source ATmega8 prototyping board
Self Balancing Robot: Proof of concept for future human-rideable project