Ray Sun

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

Analog/RF IC design PhD student pursuing opportunities in circuit design and RF/mmWave systems

LINKS

Website: **electronictoast.github.io**
Github:// **electronictoast**
LinkedIn:// **ray-sun-2020**

EDUCATION

USC
PhD | Electrical Engineering
MS Dec 2022 | Los Angeles, CA

CALTECH
BS | Electrical Engineering
June 2020 | Pasadena, CA

SELECTED COURSES

USC
Advanced Analog/Mixed-Signal Circuit Design • Advanced VLSI • Computational Electromagnetics • Biomedical Imaging

Caltech
Advanced Digital System Design • FPGAs with VHDL • Analog Design Laboratory

Teaching Assistant
Advanced Embedded Systems • Embedded Systems • Mechatronics

SKILLS

IC DESIGN
Cadence Virtuoso, Spectre • Calibre • Ansys HFSS, Maxwell • TSMC 65nm

HARDWARE / FIRMWARE
Tools:
Altium Designer • KiCad • LTSpice • Autodesk Inventor • SolidWorks
Technologies:
STM32 / ARM MCUs • Xilinx FPGA • Arduino / AVR • Raspberry Pi

PROGRAMMING
C/C++ • Python • Verilog • Assembly (AVR, ARM) • MATLAB/Simulink • LaTeX• Linux

MISCELLANEOUS
Amateur radio license (General class) • Mandarin Chinese (spoken) • German (elementary) • Japanese (basic)

RESEARCH

ANALOG/RF IC, MICROSYSTEMS, & ELECTROMAGNETICS LAB
USC | Graduate Research Assistant
August 2020 – Present | Los Angeles, CA

- Designed 1.2-1.7 / 2.9-4 GHz concurrent dual-frequency drift-compensated magnetic spectrometer (65nm CMOS) enabling single-step and wash free magnetic label immunoassays on-chip. **Presented at ESSCIRC 2022.**
- Designed 14 GHz spectrometer (65nm CMOS) for novel wearable and point-of-care biomedical applications. **Taped out Sep. 2022.**
- Designing FPGA (Xilinx Artix-7) data acquisition system / proof-of-concept portable biosensing platform for 14 GHz spectrometer.

AEROSPACE ROBOTICS AND CONTROL LAB
Caltech | Undergraduate Research Assistant
June 2017 – March 2018 | Pasadena, CA

- Assisted development of spacecraft simulator robot: hardware selection; thruster characterization; designed low-level thruster controller board.
- Designed STM32-based second-generation thruster controller boards.

EXPERIENCE

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

- Supported hardware and FPGA (Xilinx, Verilog) development for 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 aircraft powertrain modules for ground testbed and flight aircraft.
- Designed and tested 15 Mbps isolated dual-channel CAN transceiver.

RECENT PROJECTS

Jackrabbit: 100 MHz 16-channel logic analyzer probe
Bifrost, **Nibelung**, and **Aurora:** Successive generations of open source RGB LED controller boards with music visualization capabilities, onboard microphone
Triumph: Accurate and robust analog function generator (sine, square, triangle)
GaNFET Motor Controller: 5kW brushless motor controller, STM32F4

ACTIVITIES AND ORGANIZATIONS

IEEE : Member of USC IEEE student branch. Former chair of Caltech IEEE student branch, organized events for networking, outreach, and education.
USC Solar Car Team : Advising undergraduate solar car vehicle competition team on electrical system design, including battery management and sensor interfaces.
Caltech Formula SAE Team : Designed, verified, and integrated 2 generations of STM32F4-based electric vehicle pedals interface PCB. Designed temperature sense and high voltage sense circuit for 2nd generation battery management system.
Tau Beta Pi : Member of engineering honor society.