

Ray Sun

rayjhsun@gmail.com | (909)-568-1186

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

LINKS

Website: electronictoast.github.io
Github:// [electronictoast](#)
LinkedIn:// [ray-sun-2020](#)

EDUCATION

USC

PHD | ELECTRICAL ENGINEERING
MS May 2024 | GPA: 4.0/4.0

CALTECH

BS | ELECTRICAL ENGINEERING
June 2020 | GPA: 4.2/4.3

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 • Calibre • Ansys
HFSS • TSMC 65nm

HARDWARE / FIRMWARE

Tools:

Altium Designer • KiCad • LTSpice •
SolidWorks, OnShape

Technologies:

STM32 / ARM MCUs • Xilinx FPGA •
Arduino / AVR • Raspberry Pi

PROGRAMMING

C/C++ • Python • Verilog • Assembly
(AVR, ARM) • MATLAB •

Linux

MISCELLANEOUS

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

RESEARCH EXPERIENCE

ANALOG/RF IC, MICROSYSTEMS, & ELECTROMAGNETICS LAB

USC | GRADUATE RESEARCH ASSISTANT

August 2020 – Present | Los Angeles, CA

- Designed 14 GHz spectrometer (65nm CMOS) for novel wearable and point-of-care biomedical applications. **To be presented at ISSCC 2024.**
- 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 FPGA (Xilinx Artix-7)-based 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.

WORK 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

Aurora: RGB LED controller with music visualization capabilities, microphone

SAR ADC: 8-bit time-interleaved, 45nm (schematic), 1 GS/s, 11 mW, 5.5 ENOB

SRAM: 8x16-bit with 6T cell (layout), max 4 GHz; compute-in-memory (schematic)

OTA: 2-stage DC-coupled, 45nm (schematic); 2.2 GHz UGBW, 11 mA, rail-rail input

Triumph: Accurate and robust analog function generator (sine, square, triangle)

GaN FET Motor Controller: 5kW BLDC, STM32F4, CANBus interface

INVOLVEMENT

IEEE : Member of USC IEEE student branch. Former chair of Caltech student branch.

USC Solar Car Team : Advising undergraduate solar car vehicle competition team.

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.