

HAOYANG LI

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EDUCATION

Southern University of Science and Technology Bachelor of Engineering School of Microelectronics • Overall GPA: 3.94/4.0 Ranking: 1/127 (Among all students majoring in Microelectronics at SUSTech)	Shenzhen, China August 2022 – June 2026
University of California, Berkeley Visiting Student Department of Electrical Engineering and Computer Sciences • GPA: 4.0/4.0 • Undergraduate researcher at Prof. Robert Pilawa's research group	Berkeley, U.S.A August 2024 – May 2025
University of California, San Diego Visiting Student Department of Electrical and Computer Engineering • Undergraduate researcher at Prof. Prasad Gudem's research group • Research on capacitor cubing circuits and explore their applications in both digitally controlled oscillators (DCOs) for digital phase-locked loops (PLLs) and ultra-high-Q RF filters.	La Jolla, U.S.A May 2025 – September 2025

HONORS

• Outstanding Student Scholarship, Second Prize (top 10%)	2023, 2024
• The second "Material Art" Competition, Second Prize	2022

RESEARCH INTERESTS

Analog and Mixed-Signal Integrated Circuits Design

PUBLICATIONS

[1] A New Y-function MOSFET Mobility Extraction Method Accounting for Coulomb Scattering at Cryogenic Temperatures

Shilong Li, Chengbo Yang, Hao Su, **Haoyang Li**

- **Accepted by 8th Sino MOS-AK Workshop 2024. (August 2024)**
- **Under Review: International Journal of Numerical Modelling: Electronic Networks, Devices and Fields**

RESEARCH EXPERIENCE

Analysis and Design of 48V-12V Hybrid Dickson Converter for Split-Phase Control Advisors: Prof. Robert Pilawa (Department of Electrical Engineering and Computer Sciences) • Conducted comprehensive simulations in LTSpice to analyze soft-charging dynamics, split-phase control, topology trade-offs, and design optimizations for hybrid switched-capacitor converters. • Designed PCBs using Altium Designer, focusing on component optimization, commutation loop minimization, and modular testability for testing flexible-timing split-phase control. • Contributed to the development and validation of innovative Fibonacci-Dickson fusion topologies for high-efficiency power conversion.	UC Berkeley Nov. 2024 – Mar. 2025
A New Y-function MOSFET Mobility Extraction Method at Cryogenic Temperatures Advisors: Prof. Kai Chen (School of Microelectronics, SUSTech) • Deriving the equations to extract different parameters including low-field mobility, effective mobility, the first, second, third degeneration coefficients. Using MATLAB to process MOSFET I-V data, perform computational analysis, apply linear fitting, and adjust fitting parameters to ultimately obtain the desired parameters. • Paper link: https://www.mos-ak.org/xian_2024/ (Accepted, fourth Author)	SUSTech Oct. 2023 - Jun. 2024
Testing of the bandgap reference circuit Advisors: Prof. Junmin Jiang (Department of Electrical and Electronic Engineering, SUSTech) • Study the working principles of the bandgap reference circuit. • Test the functionality of the operational amplifier and ADC blocks. • Use a Raspberry Pi to generate PWM signals for chip heating during testing.	SUSTech June. 2024 - July. 2024

ACADEMIC PROJECTS

Fully Integrated WiFi6 Baseband PGA + Low-Pass Filter Design

UC Berkeley

Advisors: **Prof. Osama Shana'a** (IEEE Fellow, Senior Director at MediaTek)

- Developed a fully integrated PGA and lowpass filter targeting 10 MHz and 20 MHz WiFi6 baseband channels.
- Full of 15 specifications, including 3dB-bandwidth, voltage gain (0dB-14dB), gain step (2dB), filter rejection, noise, linearity (P1dB, IM3), DC offset, settling time, shutdown leakage current, common-mode input/output voltage, and minimize power consumption.
- Incorporated common-mode feedback for robust DC operating point and differential signal integrity.
- Packaged using a 28-pin QFN. Assigned all pin functions and designed the SPI interface.
- All specs are met under nominal operating points, and most of them are met over PVT.

Design and Test of Buck Converter for Maximum Power Point Tracking (MPPT)

UC Berkeley

Advisors: **Prof. Jessica Boles** (Department of Electrical Engineering and Computer Sciences)

- Designed and laid out a synchronous buck converter in Altium Designer for photovoltaic maximum power point tracking (MPPT) applications.
- Built and validated a loss model including switching, conduction, winding, and core losses.
- Sized components for ripple specs and hand-wound a custom inductor.
- Assembled, debugged, and tested hardware across operating conditions.
- Implemented a closed-loop MPPT algorithm (Perturb and Observe) using a TI C2000 microcontroller.

Operational Amplifier Design for Smartwatch LCD Driver

UC Berkeley

Advisors: **Prof. Rikky Muller** (Department of Electrical Engineering and Computer Sciences)

- Design a two-stage amplifier with high gain and high output swing.
- Implemented in Cadence Virtuoso with a 45nm CMOS process.
- Sizing transistors using the gm/I_D methodology.

Implement the Tetris game on FPGA using the Verilog HDL programming language

SUSTech

Advisors: **Prof. Fengwei An** (School of Microelectronics)

- Implement the Tetris game on an FPGA using Verilog, including features such as game start and pause, block falling, left/right movement, rotation, line clearing, and score display.
- Modularize the testbench (including IP Core and PLL verification) and validate basic functionality through simulation.
- Successfully validated key functionalities on the FPGA, ensuring system reliability.

SELECTED COURSES

Analog Integrated Circuits (A)	Semiconductor for Devices and Packaging (A)
*Advanced Analog Integrated Circuits (In Progress)	Advanced Microelectronics Experiment I(A)
Power Electronics (A)	Advanced Microelectronics Experiment II(A+)
Power Electronics Design (In Progress)	Electromagnetic Field and Electromagnetic Waves(A+)
Introduction to MEMS and NEMS (A)	Semiconductor Device (A+)
Semiconductor Material Physics (A)	*Si-based Quantum Computing Cryogenic CMOS(A)
Signals and Systems (A+)	

** Represent graduate-level courses*

EXTRACURRICULAR ACTIVITIES & INTERESTS

• Member of the Dormitory Management Committee at SUSTech	Sep. 2023 – Aug. 2024
• Volunteer at the 6th Working Meeting of the Teaching Advisory Committee for Marine Science Programs in Higher Education	Sep. 2023
• Champion of the 6th Fun Sports Meet at the Zhixin College	Sep. 2023
• Outstanding Individual in the “Winter Break Alumni Homecoming” at SUSTech	Jan. 2024

SKILLS

Programming: MATLAB, C, Python, Assembly Language (RISC-V)

Design and Simulation Tools: Cadence Virtuoso, Altium Designer, KiCad, LTspice, PLECS, Silvaco TCAD