

Shuo "Sarah" FENG

B.Sc. STUDENT · INTEGRATED CIRCUIT DESIGN

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Education

Southern University of Science and Technology (SUSTech)

Shenzhen, China

B.S. IN MICROELECTRONICS SCIENCE AND ENGINEERING

Aug. 2019 - PRESENT

- **Overall GPA:** 3.91 / 4.00 (Major GPA: **3.93** / 4.00; Ranking: **2** / 77)
- **Relevant Coursework:** CMOS Analog Integrated Circuit Design (99/100), Advanced Digital CMOS IC Design (98/100), Analog Circuits (98/100), Microprocessor Design (98/100), VLSI Fabrication Technology (95/100), Electronic Design Automation (EDA) Basics (93/100), System-on-a-Chip Design (93/100), Signals and Systems (93/100), Engineering Electromagnetics (97/100)

Projects

High-Speed, Large-Swing Optical Modulator Driver with All-Pass Filter (APF)-Based Dynamic Bias and 2-Tap Feed-Forward Equalizer (FFE)

SUSTech, Shenzhen, China

PROJECT LEADER

Aug. 2022 - PRESENT

- Proposed a high-speed, large-output swing driver in **130-nm SiGe BiCMOS**.
- Applied the breakdown voltage (BV) doubler topology with APF-based dynamic bias to improve the output swing and the bandwidth.
- Implemented a 2-tap fractional-spaced re-configurable FFE to compensate for the insufficient bandwidth of optical modulators.

Large-Swing Breakdown Voltage (BV) Doubler Topology Drivers with Inductive-Peaking-Based Bandwidth Extension Techniques

SUSTech, Shenzhen, China

PROJECT LEADER

Mar. 2022 - PRESENT

- Gained expertise in inductive-peaking-based bandwidth extension techniques during design using **130-nm SiGe BiCMOS** process.
- Demonstrated the effectiveness of T-coils and three-end transformers in an electrical/optical (E/O) system where a Verilog-A model for Mach-Zehnder Modulator (MZM) with a 3-dB bandwidth of 35 GHz is used.
- Continuing to do research on the distributed output networks in transmitters (TXs).

Low-Power Consumption, High-Precision Relaxation Oscillation with Fully-on-Chip Voltage Reference and Low-Dropout (LDO) Regulator

SUSTech, Shenzhen, China

CORE MEMBER

Mar. 2022 - July. 2022

- Developed a relaxation oscillation in **TSMC 180-nm CMOS** process with fully-on-chip voltage reference and LDO regulator.
- Simplified the logic control circuits to save power and chip area.
- Improved the delay compensation technique for oscillators to achieve the minimized sensitivity to temperature variations.

High Output Voltage Swing Breakdown Voltage (BV) Tripler Topology Driver with Analog Multiplexer (AMUX)-based Feed-Forward Equalizer (FFE)

SUSTech, Shenzhen, China

CORE MEMBER

Jan. 2022 - PRESENT

- Participated in system circuit design and verification in **130-nm SiGe BiCMOS** process.
- Confirmed of the validity of the incorporated equalization stage (FFE stage), for compensating the bandwidth.
- Finished the layout and post-simulation of partial blocks, and this work is supposed to be sent out for tapeout in August 2022.

Experience

Nanyang Technological University

NTU, Singapore

EXCHANGE UNDERGRADUATE STUDENT

Jan. 2023 - May. 2023 (FUTURE)

- Received a recommendation for the Spring 2023 semester for the University Exchange Program (NTU).

Undergraduate Research, Communication Integrated Circuits and Systems Laboratory (Prof. Quan Pan)

SUSTech, Shenzhen, China

RESEARCHER FOR <WIRELINE / WIRELESS HIGH-SPEED COMMUNICATION ICs DESIGN>

Oct. 2021 - PRESENT

- Researched high-speed, large-swing optical transmitters with equalization techniques.
- Implemented optical modulator drivers that can transmit 160-Gb/s PAM-4 signals with 4-Vppd output voltage swing, and verified the proposed electrical driver by doing the co-simulations in an E/O system.

University of Oxford, Department of Computer Science, Academic Winter School

Oxford, United Kingdom

ONLINE DISTANCE LEARNER OF OXFORD STUDY ABROAD PROGRAMME

Jan. 2022

- Obtained credit of course "Artificial Intelligence and Machine Learning" by engaging in 150 hours independent study and project work.

National University of Singapore (NUS), School of Computing

NUS, Singapore

PROJECT LEADER IN <EMBEDDED PART>

May. 2021 - July. 2021

- Developed an embedded smart terrarium system based on Raspberry Pi to collect environmental data and sent to neural network.

Undergraduate Research, Energy-Efficient Integrated Circuit (EEIC) Laboratory (Prof. Chenchang Zhan)

SUSTech, Shenzhen, China

RESEARCHER FOR <POWER MANAGEMENT AND ENERGY HARVESTING ICs DESIGN>

Sept. 2020 - Oct. 2021

- Studied low-power integrated circuit design methodology and gained practical experience in IC design.
- Researched on various topologies of low-dropout (LDO) regulators, as well as basic design ideas and circuit analysis of oscillators.

Publications & Patents

A 4-Vppd 160-Gb/s PAM-4 Optical Modulator Driver with All-Pass Filter-Based Dynamic Bias and 2-Tap FFE in 130-nm BiCMOS

Published in IEEE APCCAS 2022

FIRST AUTHOR

Aug. 2022

- A high-speed, large-output swing driver with 2-tap feedforward equalizer (FFE) for optical modulators in 130-nm SiGe BiCMOS process.

A Large Output Swing Driver Circuit Design

National Intellectual Property Office

INVENTOR

Sept. 2022

- Application No.:202210504804.X
- This patent implements the breakdown voltage (BV) multiplier topology dynamic bias to avoid the breakdown of BJT transistors.

A Laborsaving Wire Pliers

National Intellectual Property Office

INVENTOR

Apr. 2018 - Apr. 2020

- Application No.:CN201820613788.7
- By pressing the pincer handle, the utility model can save effort for wire tensioning operation and subsequent tightening operation.

Honors & Awards

INTERNATIONAL

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|------|---|-----------|
| 2022 | Finalist , Consortium for Mathematics and Its Applications (COMAP), ICM Contest | U.S.A |
| 2021 | 1st Prize , NUS Summer Workshop, Embedded System and Deep Learning | Singapore |
| 2021 | Honorable Mention , Consortium for Mathematics and Its Applications (COMAP), ICM Contest | U.S.A |

DOMESTIC

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|------|---|-----------------|
| 2022 | 1st Class , SUSTech 2022 Merit Student Scholarship | Shenzhen, China |
| 2022 | 2nd Award , China College IC Competition | Fuzhou, China |
| 2021 | 1st Class , SUSTech 2021 Merit Student Scholarship | Shenzhen, China |
| 2021 | Top 5 , SUSTech 2021 Jiang Bolong Scholarship | Shenzhen, China |
| 2020 | 1st Class , SUSTech 2020 Merit Student Scholarship | Shenzhen, China |

Leadership & Activities

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|------|---|-----------------|
| 2022 | Secretary , SUSTech IEEE Student Branch | Shenzhen, China |
| 2021 | Member , SUSTech Shude College Women's Football Team | Shenzhen, China |
| 2021 | Leader , Huawei Developer Conference 2021 | Shenzhen, China |
| 2020 | Officer , SUSTech, School of Microelectronics (SME) 2019 Grade Class Committee | Shenzhen, China |
| 2020 | Director , SUSTech Shude College Publicity Center | Shenzhen, China |
| 2019 | Officer , SUSTech Shude College STEAM+ Education | Shenzhen, China |

Skills

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| Programming | JAVA, Verilog, LaTeX, Markdown, Python, Arduino, Linux |
| Tools | Cadence, Silvaco, Quarters, Modelsim, Matlab, Visio, Origin, Multisim, Microsoft, TimeGen |
| Languages | Chinese (native), English (fluent), Cantonese (basic) |