YIZE LIU

College of Information Science and Electronic Engineering, Zhejiang University, P.R. China
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RESEARCH INTEREST

- Nanotechnology: Novel devices, Memristor, Biosensors
- Circuits: Integrate circuits architecture, Neuromorphic systems, AI hardware/software codesign.

EDUCATION

Zhejiang University **Hangzhou, China**
College of Information Science and Electronic Engineering
BS in Electronic Science and Technology (GPA: 3.94/4.00) Sept. 2021-Jun. 2025

- Selected courses: Basics of Electronics and Circuits (4.0), Fundamentals of Optoelectronics (4.0), Brain and "brain-machine" Integrated Systems (4.0), Principles and Design of Integrated Circuits (4.0), Principles and Design of Computer Composition (4.0), Electromagnetic Field & Waves (4.0), Data Analysis and Algorithm Design (4.0), Quantum Information (4.0)

Chu Kochen Honors College (**Honor**)
Intensive Training Program of Innovation and Entrepreneurship (Minor) (GPA: 4.00/4.00) Sept. 2022-Jun. 2025

- Selected courses: Management (4.0), Economics (4.0), Business Model (4.0), Entrepreneurial Strategy (4.0)

Massachusetts Institute of Technology (MIT) **Cambridge, MA, US**
Visiting Student in Media Lab Jun. 2024-Dec. 2024

PUBLICATION

1. Yu Xiao†, **Yize Liu† (Contribute equally)**, Bihua Zhang†, Peng Chen, Huaze Zhu, Enhui He, Jiayi Zhao, Wenju Huo, Xiaofei Jin, Xumeng Zhang, Hao Jiang, De Ma, Qian Zheng, Huajin Tang, Peng Lin*, Wei Kong* and Gang Pan*. Bio-plausible Reconfigurable Spiking Neuron for Neuromorphic Computing. ***Science Advances.***
2. **Yize Liu,** Zhichu Ren, Liang Zhao*, ReALSM: ReRAM-Assisted Liquid State Machine Architecture for Large-Scale and Low-Power Edge Computing. *2024 ACM/IEEE International Conference on Computer-Aided Design (**ICCAD**), Student Research Competition*.
3. **Yize Liu**, Jiayi Zhao, Yu Xiao, Peng Chen*, Haisong Chen, Enhui He, Peng Lin* and Gang Pan*, Variation-resilient Spike-timing-dependent Plasticity in Memristors Using Bursting Neuron Circuit. (Under review)

RESEARCH EXPERIENCE

Media Lab, Massachusetts Institute of Technology Cambridge, MA
Research Assistant to Assistant Professor Deblina Sarkar Jul. 2024- Dec. 2024
Scalable Micron-level Solid-State Battery Array for Neuron Modulation Microrobots

- Designed the process, fabricated the whole micro-batteries and built simulation models.
- Conducted electrochemical measurements and analysis of the devices.
- Developed CMOS-compatible batteries with different novel structures and features at micron-level volume.

State Key Laboratory of Brain-Machine Intelligence Hangzhou, China
Research Assistant to Professor Peng Lin Dec. 2023-Jun. 2024
Bio-plausible Electronic Neurons and Algorithm Design for Neuromorphic Computing

- Designed a reconfigurable neuron circuit based on NbO_2 memristors and non-volatile electrochemical memory.
- Conducted behavioral modeling and experimental measurement of the neuron circuit.
- Designed an unsupervised spiking neural network based on designed neuron circuits for on-chip running.
- A co-first author manuscript accepted by *Science Advances.*

State Key Laboratory of Brain-Machine Intelligence Hangzhou, China
Research Assistant to Professor Peng Lin Sept. 2023-Present
Brain-Inspired On-Chip Learning Integrated System for Neuromorphic Computing

- Taped out a 5*5mm TSMC 0.18um chip with 150 bio-plausible neurons and hundreds of operating modes.
- Developed a noise-resilient on-chip STDP training rule based on Ta_2O_5 memristors and CMOS neurons.
- Achieved 5.2% SNN accuracy increase and 4.82× variation decrease. A first author manuscript under review at *Neuromorphic Computing and Engineering.*

State Key Laboratory of Brain-Machine Intelligence Hangzhou, China
Institute of Integrated Circuit Pilot Technology, Zhejiang University Hangzhou, China
Research Assistant to Professor Peng Lin and Liang Zhao Jun. 2023-Jan. 2024
Hybrid RRAM-CMOS Chip and Adaptive Large-Scale Multimodal Algorithms

- Designed a Leaky Integrate-and-Fire (LIF) CMOS neuron circuit, and is taping out in a 5*5mm chip with 512*512 Ta_2O_5 memristors.
- Designed a nearly end-to-end on-chip circuit architecture for multi-model edge computing algorithms, with at most

1266× reduction in power consumption compared to the related works.
- A first author manuscript accepted by *ICCAD 2024*. Won the First Place in *ACM Student Research Competition @ICCAD'24*

Institute of Integrated Circuit Pilot Technology, Zhejiang University Hangzhou, China
Research Assistant to Professor Liang Zhao and Xunzhao Yin Jan. 2023-Jun. 2023
Software/Hardware Codesign of CNN Accelerator Based on Ferroelectric Transistors (FeFET)
- Designed a FeFET-based frequency multiplexing computing and Fast Fourier Transform circuit architecture.
- Conducted circuits simulations, algorithms design and data analysis.
- Achieved 1.32× increase in parallelism, 5.32× increase in throughput compared to the most recent work, demonstrating 11.4× reduction in power consumption.
- A first author manuscript to be submitted.

CONFERENCE

2024 ACM/IEEE International Conference on Computer-Aided Design New Jersey, US
Presentation and Post Oct. 2024
ReALSM: ReRAM-Assisted Liquid State Machine Architecture for Large-Scale and Low-Power Edge Computing

ADDITIONAL INFORMATION

Extracurricular Experiences
- Assistant Minister of the College Student Department of Science and Technology, Zhejiang University.
- President of Wanyun Peking Opera Art Club, Zhejiang University.
- Member of the college football team.
- Preliminary Volunteer for the 19th Asian Games Hangzhou 2022.

Entrepreneurship Projects and Training Experiences
- Yigou Technology, Multi-mode heterogeneous UAV detection system (Leader of 30-person team). Sept. 2022
- XbotPark Technology Innovation Training Camp (Top 5%). Feb. 2024

Selected Awards
- Yuelun Scholarship (Top 1%) Dec.2024
- First Place in ACM Student Research Competition @ICCAD Oct.2024
- ICCAD Student Scholarship Oct.2024
- College Shannon Scholarship (Top 3%) May. 2024
- China Optics Vally Scholarship (Top 1%) Oct. 2024
- University-level Third Prize Scholarship Oct. 2023/Oct.2024
- Gold Award (Province) for China International College Students' Innovation Competition. (TOP 3%) Jul. 2023

Experiment and Fabrication Skills: Photolithography, Physical deposition (E-beam, Sputtering), Chemical deposition (PECVD), Dry/Wet etching, SEM (Trained in MIT Nano.)

Software Skills: Cadence (Spectre, Virtuoso), TCAD (Silvaco), COMSOL, KLayout, Altium Designer, Multisim, MATLAB

Program Language: C, Python, Verilog

Language: Mandarin (Native), English (Proficient)