Jiatong Guo

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Research Interests

(1) Machine Learning (2) Human-Machine Interaction (3) Neuromorphic Computing (4) AI HW Accelerator

Education

Boston University (BU) **Boston, Massachusetts, USA**
Electrical and Computer Engineering PhD Program **Sept 2025 - Current**

- Advisor: Eshed Ohn-bar

University of California, Santa Barbara (UCSB) **Goleta, California, USA**
Academic Graduate Preparation Program **Sept 2024 - June 2025**

- **GPA: 3.95/4** in Electrical and Computer Engineering
- **Courses (Graduate-level)**: Tensor Computation in Machine Learning (A), Imaging System (A-), Neurally Inspired Computing Systems (A), Robustness in Machine Learning(A), Machine Learning for Bio-images (A), Uncertainty Quantification and Scientific Machine Learning (A)
- Join Prof. Zheng Zhang's lab to participate in a research project focused on developing a tensor-based, hardware-efficient on-device training framework using In-BRAM computation on FPGA

Huazhong University of Science and Technology (HUST) **Wuhan, Hubei, China**
Bachelor of Engineering **Sept 2021 - June 2024**
Major: Integrated Circuits and System (Innovation Honor-class of Optical and Electronic Information School)

- **GPA: 92.5/100 (WES Official: 3.93/4)** **Ranking: 2/33**
- **Core Courses**: Fundamentals of Digital Integrated Circuit, Digital Signal Processing, Processor Architecture, Analog Integrated Circuit Design, Digital Logic and System Design, Embedded System Design, Principles of Computer Organization, Single Chip Microcomputer, Semiconductor Physics and Devices, Verilog HDL

Publications

- **Jiatong Guo**, Jinxiang Gao, Chao Wang*, et al. "A Low-Latency and High-Accuracy Dual-Mode Neuron Design for Accelerating Neurological Diseases Simulation and Analysis." 2024-2024 **IEEE Region 10 Conference (TENCON)**. IEEE, Singapore, 2024.

Research Experience

Institute of Brain and Cognitive Science, New York University Shanghai
Research Assistant (Supervisor: Prof. Zhuocheng Xiao, NYU Shanghai) *July - Sept 2024*
Project: Multiband Neuronal Oscillations Produced by Inhibitory Neural Circuits

- Designed a 400-neuron (Integrate-and-Fire neuron model) network in Matlab to model a small copy of the mouse visual cortex layer 2/3, generating multiband neuronal oscillations (gamma, beta, alpha, etc.) using data from the Allen Institute (projection probability, synaptic strength, etc.)
- Conducted extensive simulations to explore the systematic relationship between biological parameters and the various types of neuronal oscillations observed in the network
- Documented the network design details and summarized findings in a research document, available at here

Low-power and Intelligent Integrated Circuit Lab, Huazhong University of Science and Technology
Project Leader (Supervisor: Prof. Chao Wang, HUST) *Feb 2023 - July 2024*
Project: Reconfigurable Neuromorphic Hardware Design for Spiking Neuron Model

- Proposed a dual-mode spiking neuron hardware design (Hodgkin-Huxley model & Adaptive Exponential model) using an optimized reconfigurable pipeline based on data flow dependency and Reconfigurable

Fast-Convergence CORDIC algorithm

- Simulated the proposed dual-mode neuron design in Python and conducted hardware implementation in Vivado, demonstrated that our design achieves up to 4.8X improvement in latency and 3.0X in accuracy
- Analyzed the implementation results, summarized design methods, and wrote research paper as first author (published at the ***IEEE Region 10 Conference***, Singapore, Dec 2024), manuscript available at here
- Led a five-person team, and took in charge of project schedule management and task allocations

Academic Competition & Project

International Competition of Autonomous Running Robots **Beijing, China**

Team Leader ***July - Aug 2023***

- Developed surroundings recognition algorithms in Python, allowing the robot to autonomously identify its environment and execute corresponding actions to overcome obstacles such as single-plank bridges, stairs, and minefields
- Designed sequences of servo motor parameters to control the robot's movements, including forward motion, redirection, and rolling over

Digital Image Processing System on PYNQ-Z2 FPGA **HUST, Hubei, China**

Project Leader ***Dec 2023 - Jan 2024***

- Developed a image processing system on FPGA, capable of performing image enlargement, edge extraction, erosion, and dilation, with output displayed via HDMI
- Designed the image processing system's overall framework, the system control unit and HDMI display module using Verilog Hardware Description Language

Leadership & Teaching Assistant Experience

Class Monitor of Innovation Honor-class in HUST-OEI **HUST, Hubei, China**

Class monitor **Sept 2021 - June 2024**

- Organized group learning activities and help classmates resolve academic problems and personal difficulties
- Coordinated with other classes to organize collaborative activities and events

Peer-support Academic Counseling Project **HUST, Hubei, China**

Group Leader, Teaching Assistant **Sept 2022 - Dec 2022**

- Led the Physics peer counseling team, assisting underperforming students in improving their academic performance while managing the team's schedule and task distribution
- Delivered lectures on Physics, Circuit Theory, and Analog Electronic Principles as teaching assistant

Honors & Awards

- **Undergraduate National Scholarship** **(top 0.2% Nationwide)** **09/2024 & 09/2023 & 09/2022**
- HUST Model Student (top 5%) 09/2024 & 09/2023 & 09/2022
- HUST Outstanding Graduate Honor (top 20%) 06/2025
- **Boston University CISE PhD Award** **(top 10%)** **04/2025**
- The Hui-ding Company Scholarship (top 0.2%) 12/2023
- HUST Extraordinary Undergraduate Student (top 2%) 12/2022
- The Optic Valley of China Scholarship (top 0.5%) 11/2022
- HUST Academic Excellence Scholarship (top 10%) 05/2022

Skills

- **Computer Skills:** Programming (Verilog Hardware Description Language, Python, Matlab, C); Office (Word, LaTeX, Excel, PowerPoint); Plot (Visio, Xmind, TimeGen, Matlab)
- **Language Skills:** Mandarin (native), fluent in English (TOEFL scores: 102/120, L27 R27 S22 W26)
- **Life Skills (Hobbies):** Basketball, Video Producing, Photography