Guanyu Qian

gyqian@ucla.edu | LinkedIn | GitHub | +1 (530) 407-7839 | Los Angeles, CA

EDUCATION

University of California, Los Angeles (UCLA)

Doctor of Philosophy in **Electrical & Computer Engineering | GPA 3.80/4.0** 2022 - Present

- **Related Courses:** Advanced Analog and Digital IC design, VLSI System, Machine learning and large-scale data mining, Human-AI Interface, Neural Network, Linear Programming, MEMS Design, Embedded System, Power Electronic
- **Research Areas:** Efficient & Stable Power Delivery and Regulation, Power Electronic Design for GPUs and Data Center Power Supply Units.
- **Progress:** Master's degree earned in June 2024

University of California, Davis (UC Davis)

Bachelor of Arts and Science (Double Major) in **Applied Physics** and **Economics | GPA 3.72/4.0** 2018 - 2022

- **Related Courses:** Electronic Circuits, Device Physics, Electromagnetic, Classical, Computational, Mathematical, Particle, Quantum, Thermal, Statistical and Solid-State Physics. Micro & Macroeconomics, Econ of Uncertainty, Analysis of Econ Data, Econometrics.

SKILLS & PROFICIENCIES

Programming Skills: Python, C++, C, JavaScript, Verilog, MATLAB
Professional Software: Altium, Cadence Virtuoso, OrCAD, Modelsim, COMSOL, LTSPICE, PLECS, Synopsys RTL synthesis, STATA, Microsoft Office
Hardware Development: XEM7010, Raspberry Pi, ESP32
Languages: Chinese (Native), English (Proficient), Japanese (Elementary)

PUBLICATIONS

- **Overcoming High Frequency Limitations of Current-Mode Control Using a Control Conditioning Approach.** (Tentative title; submission to IEEE Transactions on Power Electronics planned for late Nov. 2024)
- Deng, T., Qian, G., An, W., Dong, C., & Liu, G. (2023). **Dynamic Modulation transmission Policy for wireless communication network with energy harvesting**. https://doi.org/10.1109/icece59822.2023.10462294
- Qian, G., Liu, W., Hao, D., & Li, W. (2021). **Key Technologies for beamforming in millimeter wave communication system.** Journal of Physics: Conference Series, 2031(1), 012029. https://doi.org/10.1088/1742-6596/2031/1/012029

RESEARCH EXPERIENCES

Power Electronics and Energy Control (PEEC) Laboratory | UCLA Advisor: Xiaofan Cui

Graduate Student Researcher 11/2023 – Present

"With one goal in mind at PEEC Laboratory: to create the finest DC-DC converter with robust control."

- A High Frequency COT Buck Converter for CPU Voltage Regulation: 11/2023 – Present

Addressing Stability Issues in Dynamic Voltage Scaling (DVS)

- Developed a Current Mode Control **Constant-On-Time (COT) Buck Converter** for **CPU power supplies** under light load conditions, successfully addressing stability issues in **Dynamic Voltage Scaling** (DVS) from 12V to 1V and 12V to 2V.
- Designed and implemented three stability solutions in sampled state space domain, including **slope compensation** and **filters,** with a novel analog-based approach involving **comparator modeling** and **overdrive conditioning**.
- Independently managed the full development cycle, starting from **simulations (MATLAB, PLECS)**, **PCB design (Altium)**, and **component selection**, to hands-on soldering and final validation/testing, while developing control logic in Verilog for **FPGA implementation**.
- Preparing submission to IEEE Transactions on Power Electronics, targeting late Nov. 2024.

- Battery Aging prediction with LSTM model and Transfer Learning: 03/2024 – 05/2024

Improving Prediction Accuracy for Battery Lifespan Under Varying Conditions

- Developed an **LSTM model** using **PyTorch** to predict **battery aging** curves based on data from 8 manufacturers, capturing variations in **state-of-charge (SOC)** and **temperature conditions**.
- Optimized model through **hyperparameter tuning** to improve predictions across diverse chemistries and temperature profiles
- Identified areas for future development, focusing on **transfer learning** strategies to enhance model robustness and accuracy. (Preparing findings for publication)

Muon Lifetime & Cosmic Background Radiation Detection | UC Davis Advisor: J. Anthony Tyson

Distinguished undergraduate student in advanced physics Lab course 04/2022 - 06/2022

- Conducted hands-on experiments to measure muon mean lifetime using a custom-built detection system with **plastic scintillators** and **photomultiplier tubes**, while designing and implementing **logic circuits** for real-time muon counting.
- Engaged in the design and construction of a high-frequency **RF system**, incorporating a **radiometer**, **low-noise amplifier (LNA)**, **mixers**, and **passive filters**, to investigate cosmic microwave background radiation at 19 GHz.
- Performed detailed data collection, applying **scientific analysis** techniques to simulate the **decay curve of muons**, and successfully extrapolated the **cosmic background temperature** through precise instrumentation and experimental procedures.

INTERNSHIP EXPERIENCES

Smart Shine Beijing, China

Research Intern at Terminal Module Department 07/2021 - 09/2021

- **AR Smart Glasses Project R&D**: Acquired proficiency in **PADS software** for circuit design on PCBs; performed tests on **power-up timing**, **power supply ripple**, and **MIPI signal integrity** using **oscilloscopes**; validated performance indicators of primary and secondary camera ports and display screen.
- **5G Millimeter Wave Research**: Co-authored a comprehensive literature review from WCNC and ACC conference papers, engaged in scholarly discussions with team members, and projected future development trajectories and potential enhancements for **millimeter wave technology**, published in the Journal of Physics: Conference Series (ISSN: 1742-6588).

Xiaomi Beijing, China

Project Manager Intern 08/2020 - 09/2020

- Conducted user surveys on emerging UI trends and developed project timelines, providing insights that drove a successful UI update.
- Analyzed and reviewed regulatory compliance for new UI launches, ensuring adherence to different government regulations across various markets.
- **Coordinated cross-departmental efforts** to implement updates in product specifications and compliance provisions, facilitating communication between engineering, legal, and marketing teams.

TEACHING EXPERIENCES

Circuit Theory II (ECE110) | UCLA 04/2024 - 06/2024

Teaching Assistant *Overall Evaluation Score:* ***8.0/9.0***

- **Led three weekly in-person discussion sessions for 130 students**, teaching critical concepts such as Laplace Transforms, circuit analysis for RLC networks, frequency response, and two-port network.
- **Developed and authored discussion materials** and practice exams aligned with course content to support student learning and success.
- Held regular office hours, communicated effectively with students, graded exams, and provided comprehensive feedback to enhance their understanding.

Electronic Circuit II (EEC100) | UC Davis 10/2020 - 12/2020

Undergraduate Student Lab Assistant

- Volunteered as a lab assistant for an upper-division Electronic Circuit course, **assisting over 30 students in weekly lab sessions** and providing constructive feedback on their reports.
- Guided students in circuit assembly and troubleshooting with the **ADALM2000** module, ensuring circuits met expected functional requirements and helping students understand core concepts in circuit design.

PROJECT EXPERIENCES

FPGA Wiring and Switching Channel Optimization | UCLA 04/2023 - 06/2023

- Undertook research to enhance **wiring channels** in **Field Programmable Gate Arrays (FPGAs)** using **14nm FinFet technology**, resulting in a 10-20% decrease in delay times for different routing segment lengths.
- Developed and simulated two distinct switch blocks for different signal segment lengths, integrating design with key metrics such as **Power-Delay Product** to evaluate performance.
- Implemented project specifications into logic block output designs, ensuring transistor size adherence and devising effective strategies to accommodate device mismatch factors.

High-Performance Differential Amplifier Design | UCLA 10/2022 - 10/2022

- Employed **Candence Virtuoso tools** for high-performance amplifier design, strictly adhering to design specifications.
- Configured a **two-staged OTA** with a closed-loop gain of 8 with a differential output swing of 1.8 V, maintaining gain error within 1%.
- Improved circuit performance, achieving a large signal settling time of only 40 nanoseconds with a 0.5% error while guaranteeing low power consumption.