

Guanyu Qian

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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, MEMS Design, Embedded System, Neural Network, Power Electronic
- **Research Areas:** Efficient & Stable Power Delivery and Regulation, Power Electronic Design for GPUs and Data Center Power Supply Units.

University of California, Davis (UC Dais)

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, Quantum, Thermal, and Solid-State Physics. Micro & Macroeconomics, Statistics, 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

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 September 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

“As a graduate researcher at the PEEC Laboratory, my work focuses on cutting-edge solutions for improving power electronics and energy efficiency in high-performance computing environments. My experience spans multiple research projects, each addressing critical challenges in the field”

- 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 innovative stability solutions, 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 September 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 based on data from 8 manufacturers, addressing variations in state-of-charge (SOC) and temperature conditions.
- Designed a 3-layer neural network to accurately forecast battery decay curves, with the aim of applying predictions across different battery chemistries and temperature profiles.
- Actively developing and implementing transfer learning strategies to improve prediction accuracy, which is currently 60-90% depending on the dataset. (Final paper is in progress for submission to a peer-reviewed journal)

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

- Reviewed new treaties issued by government and service providers in various countries to maintain all new product and system sold was up to standard.
- Coordinated with various departments to update provisions not aligned with new treaties

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 (EE100) | UC Davis

10/2020 - 12/2020

Student Lab Assistant

- Volunteered as a Lab Assistant for Electronic Circuit upper-division course, providing feedback on student reports.
- Guided students in verifying and constructing circuits with ADALM2000 to ensure expected functionality.
- Offered guidance on electronic circuits, addressing doubts about lab manual content.

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 segment lengths 1-3.
- 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 in a research setting, ensuring transistor size adherence and devising effective strategies to accommodate device mismatch factors.

High-Performance Differential Amplifier Design | UCLA

10/2022 - 10/2022

- Employed 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.