Hao Le

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haole.art

Education

University of California, San Diego *2023 - Present*

M.S. in Electrical Engineering

- Concentration in electronic circuits and systems.

University of California, San Diego *2018 - 2022*

B.S. in Electrical Engineering, graduated cum laude

- Concentrated on machine learning and controls. Minored in studio arts.

Experience

Integrated Electronics and Biointerfaces Laboratory *2023 - Present*

Graduate Student Researcher, PI: Shadi Dayeh

- Hardware and firmware design for high-density brain-machine interfaces using depth and surface electrodes.
- Multi-board high-speed PCB design integrating AMD Zynq Ultrascale SoCs with power management, memory devices, Wi-Fi 6E PCIe modules, BLE modules, and various peripherals.
- Extensive bare board assembly, bring-up, and re-work. Capable of working with sub-0402 and no-leads packages.
- FPGA Verilog control and data plane design to interface with custom SPI interfaces verified using simulation and timing analysis of Vivado design flow.
- Concurrent mechanical enclosure design in SolidWorks to house prototype electronics in user-friendly packaging.
- Tested neural recording and stimulation capabilities acutely on real animal brains. Able to visualize localized spatiotemporal responses in real-time and offline analysis.

Quartus Engineering *2021 - 2023*

Associate Electrical Engineer, Intern 2021 - Early 2023

- Altium PCB ARM-based custom boards running RTOS for motion and environment controls; firmware written in C/C++ to drive ICs via SPI/I2C and communicate with C# server.
- Beckhoff Automation and Click PLC programming for industrial automation.
- FPGA SPI, I2C camera interface high-speed image processing on Xilinx SoC FPGA boards. Written in SystemVerilog in Vivado. Interfaced AXI DMA cores via Vitis bare-metal apps or Petalinux.
- Optomechanical LiDAR systems design and drafting in Solidworks.
- Robotics and motion-planning with MATLAB, CoppeliaSim, and ROS.
- Presented detailed design reviews to customers that included trade studies, BOMs, and schematics.

180nm CMOS Op-Amp Design ECE 164 UCSD *Fall 2022*

Student

- Designed two-stage, folded-cascode and common-source, differential-to-single-ended operational amplifier using 180nm CMOS technology constraints. Biased with constant-gm current reference and downstream current mirrors.
- Simulated performance in Cadence Virtuoso, achieving 80dB of gain and 35MHz of bandwidth, on top of stable margins.
- Chosen out of 50 class groups to present for Apple judges; won **2nd place** prize.

Video Processing Lab UCSD *2020 - 2022*

Student Researcher

- Co-authored ISOCC 2021 paper *Human-Inspired Camera: A Novel Camera System for Computer Vision*.
- Specializing in a Unity3D synthetic platform for autonomous driving data generation and algorithm benchmarking.
- Produced large, diverse datasets tailored for robust object detection.
- Collaborated with feature-matching researchers by generating synthetic point-cloud data and pose ground truth.

Self-Hosted Portfolio Website

Personal Hobby

- Self-taught HTML, CSS, PHP, and JavaScript to make from scratch front/backend website to showcase art, music, and engineering body of work.
- Hosted on Dell Poweredge server running Apache virtually inside Proxmox; added Samba and SFTP filesharing capabilities for cloud streaming of media.

Skills

Programming Languages	***Experienced:*** Python | C | C# ***Familiar:*** CLI | C++ | PHP | HTML & CSS | SystemVerilog
Software	Altium | Cadence | Vivado Design Suite | Unity3D | SolidWorks | GIT | LabVIEW | MATLAB | LTSpice
Practical	PLC programming | Xilinx UltraScale Platform | FDM & SLA 3D printing | Soldering | CNC | Wire EDM