Matthew Wong

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EDUCATION

University of California, Berkeley — Berkeley, CA
Bachelor of Science in Electrical Engineering and Computer Sciences — *Expected December 2024*
Relevant Courses: Digital Integrated Circuits, Analog Integrated Circuits, Computer Architecture, Microelectronics, Integrated Circuit Devices, Microfabrication Technology

EXPERIENCE

Undergraduate Research Assistant — August 2024 – Present
Chien Lab, Berkeley Sensor and Actuator Center — *Berkeley, CA*
- Designed and implemented an integrated system combining an Opentrons pipetting robot and a Palmsens potentiostat to automate 3-electrode system experiments
- Engineered PCB via KiCad to support 8 electrode connections and 3D-printed components with Autodesk Inventor for parallel sample handling
- Achieved 8x increase in experiment throughput from Python lab protocol scripts

Data Engineering Intern — May 2024 – August 2024
Citylitics — *Toronto, ON*
- Improved demographic database accuracy by 15% though Levenshtein distance calculations for duplicates detection and parameter updates (county, zip-code, etc.)
- Developed a snippet labeling application to assist in training an AutoML classifier
- Created a data visualization dashboard using BigQuery to document Django admin permissions

PROJECTS

ASIC RISC-V CPU | *Verilog, DVE, Hammer* — March 2024 – May 2024
- Designed a 3-stage CPU running at 71.42 MHz
- Implemented a 4KB direct-mapped cache with SRAMs
- Verified edge-cases through testbenches and DVE
- Optimized placement and routing through wire distance analysis to minimize delay

Transistor Design | *Synopsys Sentaurus* — April 2024 – May 2024
- Developed a 20nm process n-type MOSFET using Si and SiO_2
- Analyzed effects of biasing and material thickness through band diagrams and I-V characteristics
- Achieved 60% decrease in leakage current from original design by optimizing work function and bulk doping concentration

Keyboard PCB | *KiCad* — December 2023
- Designed an Atmega32u4 microcontroller based PCB for a MX-style keyboard
- Implemented noise reduction techniques with decoupling capacitors and defined states using pull-up resistors
- Integrated a micro-USB connection to power PCB

FPGA Multi-Protocol Communication Hub | *SystemVerilog, Python, Vivado* — Ongoing
- Developing UART and I2C communication modules for integration into a multi-protocol hub on a PYNQ-Z2 FPGA
- Implementing safety assertions in verification testbenches

TECHNICAL SKILLS

Languages: Verilog, SystemVerilog, Python, C, Java, RISC-V Assembly
Tools: Vivado, Cadence Virtuoso, LT Spice, KiCad, Cadence Innovus, Hammer, Synopsys Sentaurus, Autodesk Inventor