

Philip Canoza

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EDUCATION

University of California, Berkeley *Berkeley, CA* **B.S. Electrical Engineering & Computer Science**
GPA: 3.70 *Expected Grad: May 2020*

- EE 140: Linear Integrated Circuit Design (current)
- EE 143: Microfabrication Technology
- Physics 137A/B: Quantum Mechanics
- Physics C191: Quantum Information Science
- EECS 151: Digital Design and Integrated Circuits
- EE 194/290c: 28nm Low Power Bluetooth SoC Development
- CS 162: Operating Systems
- CS 161: Computer Security (current)

SKILLS

Languages	Tools	Lab Skills
Expert: C • Linux/Unix • Python	Verilog • Cadence • HFSS	Analog Design • Digital Design
Proficient: LaTeX • Java	Lithography • AutoCAD • NumPy	Silicon Clean Room • FPGA Platforms

PROFESSIONAL EXPERIENCE

Analog Design Intern *May 2019 – August 2019*
Texas Instruments, Custom Display Power, HVAL *Santa Clara, CA*

- Studied DC power converter circuits and created pass/fail testbenches in Cadence ADEXL to verify blocks for next project
- Presented design review comparing ring and comparator-based oscillators, optimizing power consumption for serial communication
- Analyzed and verified bandgap reference architectures with consideration for semiconductor process to best suit converter IC

Digital Design Engineer *August 2018 – Present*
LEED / AI and Machine Learning, University of California, Berkeley *Berkeley, CA*

- Currently writing Honors Thesis exploring mappings of quantum many-body problems onto machine learning frameworks
- Creating a Reduced Boltzmann Machine deep learning algorithm on FPGA platform, coding project RTL (Verilog)
- Designed modules and test benches to generate adder trees, matrix multiplication modules, LFSR random number generators
- Coded scripts that generate Verilog look up tables (LUTs) for creation of optimized sigmoid functions in custom fixed point format

Hardware Design Engineer *August 2018 – May 2019*
Quantum Nanoelectronics Lab, University of California, Berkeley *Berkeley, CA*

- Designed a fast reset FPGA module using VHDL and Simulink/Matlab to speed processing speed of quantum error correcting codes
- Characterized microwave line crosstalk to qubit chips in both HFSS simulations and Digital Network Analyzer data
- Shadowed quantum architecture group to understand the role of digital hardware methods to drive complex physical systems

PUBLICATIONS

Müller Group, University of California, Berkeley *December 2017*

- Xuejian Wu, Fei Zi, Jordan Dudley, Ryan J. Bilotta, **Philip Canoza**, and Holger Müller, "Multiaxis atom interferometry with a single-diode laser and a pyramidal magneto-optical trap," *Optica* 4, 1545-1551 (2017)

PROJECTS

DIY Shark Tank Competition *July 2019*

- Won first place in DIY event through Texas Instruments pitching an Internet of Things device with a team of 3 interns
- Worked on website backend and created a microcontroller firmware interface to create a dynamically priced grocery tag

RISCV Processor *December 2018*

- Implemented a simple 32-bit processor with a RISCV instruction set architecture (ISA) on an Xilinx FPGA, coded in Verilog
- Optimized processor speed with techniques such as three-stage pipelining and simple branch prediction
- Wrote modules for I2S controllers and UART that interfaced through memory mapped IO

Two Stage Op-Amp *May 2018*

- Used Cadence to design a differential and output stage for an op amp, with considerations for voltage-short protection and input range
- Constructed BJT and MOSFET op amps by soldering SMDs (surface mount devices) based off the Cadence design
- Characterized amplifier for unity gain bandwidth, common mode rejection ratio, etc. and compared it to computer simulations

ORGANIZATIONS

Academic Chair, Historian *September 2016 – Present*
Theta Tau, Engineering Fraternity *University of California, Berkeley*

- Pitched and executed public philanthropy event to donate over \$800 to Treatment Advocacy Center to raise mental health awareness
- Oversaw the academic progress of members, organized study sessions and managed the academic resources of various majors

Undergraduate Volunteer *February 2016 – June 2016*
Environmental Justice Coalition for Water, UCB Partnership *University of California, Berkeley*

- Aided EJCW with water quality testing for Nitrates and Chrome(VI) in Salinas using acid, titration, and spectrophotometer tests
- Interviewed residents and took their questions to produce a new public factsheet on the containments for the impacted community

AWARDS AND HONORS

Tau Beta Pi Honor Society Member	EECS Honors Program
CCPOA Joe Harper Scholarship (2 years in a row)	Comcast Leaders Scholarship