Curriculum Vitae

Abraham Gonzalez
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Education

***Ph.D.* — Electrical Engineering and Computer Science** Aug. 2018 - Now
University of California, Berkeley

***Bachelors of Science* — Electrical Engineering** Aug. 2014 - May 2018
The University of Texas at Austin
GPA — Overall: 3.98/4.00 Major: 3.98/4.00

Relevant Coursework

Graduate School — Graduate Computer Architecture, Computer Architecture for Security, Hardware for Machine Learning, Machine Learning Systems, Topics in Circuit Design: Tapeouts, Topics in Computer Systems: OS.
Undergraduate School — Computer Architecture, Digital Systems Design Using HDL, Embedded Systems Design Lab, Real-time Operating Systems, Digital Logic Design, Software Design I & II, Algorithms, and Honors Engineering Design I & II, Electric Circuits Lab, Solid State Electronic Devices, Electromagnetic Engineering, Circuit Theory, Intro to Probability, and Engineering Communication.

Experience

ADEPT Lab Ph.D. Student Aug. 2018 - Now
ADEPT Lab — Berkeley, CA

- Research focus: Microarchitecture, Warehouse-scale computing, Architecture tooling.
- Main developer of BOOM, a Linux booting open-source RISC-V out-of-order core.
- Main developer of the Chipyard SoC framework.

BEAGLE: Heterogeneous Multi-Core Multi-Accelerator Chip in Intel 22FFL May 2019 - Jan. 2020
ADEPT Lab — Berkeley, CA

- Led tapeout as well as integrated core, accelerator, and uncore IP into new Chipyard SoC framework.
- Coordinated interaction between Berkeley and Intel during physical design process.
- SoC Components: In-Order Rocket core with systolic array accelerator, Out-of-Order BOOM core with vector accelerator, shared L2, independent clock domains, multiple IOs (GPIO, SPI, I2C, UART, SerDes).

Scalable Performance CPU Development Group Intern May 2018 - Aug. 2018
Intel — Austin, TX

- Worked on debugging tools for microcontroller integration team.
- Helped setup infrastructure between firmware team and microcontroller integration team to speed up work.

Microsystems Technology Lab Intern Jun. 2017 - Aug. 2017
Massachusetts Institute of Technology — Cambridge, MA

- Researched variations in electroplating growth in redistribution layers under the supervision of Dr. Boning.
- Designed various neural networks and machine learning models for electroplating growth using Tensorflow.
- Presented final research poster summarizing work and participated in multiple MITSRP workshops.

Printing Electronics Research Assistant Jan. 2017 - Jun. 2017
The University of Texas at Austin — Austin, TX

- Researched and fabricated printed antennas under the supervision of Dr. Chen.
- Printed and tested fixed PAA antennas on Kapton with various nano-particle inks.

QCA Research Assistant May 2015 - Aug. 2016
The University of Texas at Austin — Austin, TX

- Researched and designed Quantum Cellular Automata (QCA) circuitry with Dr. Swartzlander.
- Optimized QCA implementations of the Carry-Lookahead and Conditional Sum adder through QCA Designer.
- Reported back to Dr. Swartzlander on results and improvements to QCA circuit designs and layouts.

Office Shared Graphics Explore Intern May 2016 - Aug. 2016
Microsoft — Redmond, WA

- Created and added new features to the Office Ink suite using C++.
- Investigated new feature sets with other Microsoft Program Managers and customers.
- Created physical network of Arduino microcontrollers for OneWeek Hack-a-thon that once connected to each other sent a unique code to the main server (HTTP requests).

- Collaborated with senior engineers and engineers on software design and implementation.

UIM Driver Intern May 2015 - Aug. 2015
Qualcomm — San Diego, CA
- Designed software framework for smartcard interaction in C++/CLI and C++.
- Integrated designed framework into .NET application managing smartcards via CCID by utilizing APDU transmission and logging; file system viewing; file data parsing and manipulation; and smartcard reader management.
- Communicated with engineers on software design and implementation.
- Created gesture controlled car with Particle Core for Hack-Mobile Hack-a-thon.

Electronic Cooling Research Lab Assistant Jun. 2012
Villanova University — Villanova, PA
- Participated in constructing and remodeling a cooling test mechanism.
- Investigated techniques to cool spherical devices within a wind tunnel.
- Communicated with Ph.D. students and Masters students.

Selected Conferences and Presentations

RISC-V Summit Dec. 2019
University of California, Berkeley — San Jose, CA
- Presented the Chipyard SoC framework and Berkeley Out-of-Order Machine (BOOM)

52nd Symposium on Microarchitecture Conference Oct. 2019
University of California, Berkeley — Columbus, OH
- Presented the Chipyard SoC framework and Berkeley Out-of-Order Machine (BOOM)

Latch-Up Conference May 2019
University of California, Berkeley — Portland, OR
- Presented the Chipyard SoC framework and Berkeley Out-of-Order Machine (BOOM)

ACM Richard Tapia Celebration of Diversity in Computing Conference Sept. 2018
University of California, Berkeley — Orlando, FL
- Attended multiple workshops on open source software, ethics in AI, networking, and diversity.
- Participated as a UC Berkeley Scholar and FLIP Alliance student.

Society of Hispanic Professional Engineers National Conference Nov. 2017
University of Texas at Austin — Kansas City, MO
- Research Presented: A Machine Learning Approach to Modeling Electroplating Process Variations in IC Redistribution Layers.
- Participated and won the 2nd place award in the Engineering Science Symposium (ESS) Poster Competition.
- Selected as 1 of about 40 students nationally for ESS Poster Competition.
- Attended Engineering Science Symposium Oral Presentations and workshops.

Qualcomm DECA Conference Jan. 2015 - Feb. 2015
Qualcomm — San Diego, CA
- Developed professional and social skills through mock interviews and workshops.
- Participated and won Qualcomm QHack.
- Selected as 1 of 51 students nationally for DECA Conference.

Selected Projects and Publications

Spectrum: Spectre Attacks on a Speculating RISC-V Microarchitecture — Workshop Publication
- Full name: Spectrum: Classifying, Replicating, and Mitigating Spectre Attacks on a Speculating RISC-V Microarchitecture.
- Replicated Spectre v1/2 attacks on open-source BOOM core.
- Mitigated attack using speculation buffer and MSHRs.
- Presented at CARRV 2019.

Enhancing an Out-of-Order Processor Simulator for Cloud Applications — Capstone Project
- Designed and developed new software data-structures for emulating simultaneous multithreading on ZSim.
- Worked with an out-of-order processor pipeline to introduce new hardware scheduling schemes to ensure quality of service for latency critical tasks.
- Presented a poster of final results at The University of Texas Electrical Engineering Spring Open House.

Bounce Music App for Android — Individual Project
- Designed and developed an app in which a user can stream music to multiple phones within the same vicinity.
- Used Spotify API to access and display a catalog of music and sockets for basic connection capabilities.

Skills

Programming Languages —

- Highly Proficient: RISC-V Assembly, Chisel, Verilog, Make, C, C++, C++/CLI, Python, Bash, TensorFlow/PyTorch, Git, and LC-3 Assembly.
- Proficient: VHDL, ARM Assembly, Android Java, C#, and Subversion.

Embedded Systems — Tiva Launchpad, Arduino, SparkFun, and Particle Core microcontrollers.
Electrical Equipment — Soldering, oscilloscopes, logic analyzers, and multimeters.
Other — AWS EC2 (F1 platform), Cadence Physical Design tooling.

Professional Leadership and Membership

Member — Latinx Association of Graduate Students in Engineering and Science — Fall 2018 - Present
Vice President — Eta Kappa Nu Electrical Engineering Honor Society — Fall 2017 - Spring 2018
Corresponding Secretary — Eta Kappa Nu Electrical Engineering Honor Society — Summer 2017 - Fall 2017
Member — Eta Kappa Nu Electrical Engineering Honor Society — Spring 2016 - Present
Member — Institute of Electrical and Electronic Engineers — Fall 2014 - Present
Member — Society of Hispanic Professional Engineers (SHPE) — Fall 2014 - Present
Pi Tutor — Equal Opportunity in Engineering (EOE) — Fall 2015, Fall 2017
Academic Director — Society of Hispanic Professional Engineers — Summer 2016 - Summer 2017
Organizing Committee Member — 3 Day Startup Austin — Fall 2014 - Fall 2015
Participant — 3 Day Startup Austin — Fall 2014

Honors and Awards

Analog Devices Outstanding Engineer Award — University of Califonia at Berkeley — Spring 2020
EECS Excellence Award — University of Califonia at Berkeley — Fall 2018
Berkeley Fellowship for Graduate Study — University of Califonia at Berkeley — Fall 2018
GEM Fellowship Recipient — GEM — Spring 2018
Honorable Mention — NSF GRFP — Spring 2018
Highest Honors — The University of Texas at Austin — Spring 2018
Distinguished College Scholar — The University of Texas at Austin — Spring 2018
Academic Leader Hall of Fame Inductee — Equal Opportunity in Engineering Program — Spring 2018
Roberto Rocca Scholarship Recipient — Tenaris — Fall 2017
Second-Place Award Winner — SHPE National Conference Poster Competition — Fall 2017
Distinguished College Scholar — The University of Texas at Austin — Spring 2017
Victor L. Hand Scholarship Recipient — Victor L. Hand Endowed Scholarship Fund — Fall 2016
College Scholar — The University of Texas at Austin — Spring 2016
Diversity Scholarship Recipient — Texas Instruments — Fall 2015
Freshman Academic Excellence Award Winner — EOE and SHPE — Spring 2015