

**Robert Aviles**  
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**Education**

<b>2021 –</b>	<b>University of Southern California</b> Los Angeles, CA, USA	<b>PhD, Electrical Engineering</b> M.S., Electrical Engineering
<b>2019 – 2021</b>	<b>Johns Hopkins University</b> Baltimore, Maryland, USA	Bachelor of Science, Electrical Engineering
<b>2016 – 2019</b>	<b>Biola University</b> La Mirada, California, USA (Conferred Spring 2021)	Bachelor of Science, Engineering/Physics

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**Research Experience**

**Jan 22 - Present**      **University of Southern California**      Los Angeles, CA

*Superconducting Computing*

- Developed a multi-phase clocking algorithm that is amendable to polynomial time approximation and within 5% of optimal on average.
- Implemented fanout sharing optimizations to improve approximate solution for 2 clock phases to save 79% (originally 70%) of inserted buffers compared to full path balancing.
- Extended multi-phase clocking algorithm to support generation of hold safe circuits.
- Contributed to a novel cache design that consumes 13x lower energy with 35% lower latency compared to SOTA at the cost of 2.3X more area.

*Quantum Computing*

- Discovered a means of achieving parallelization of training of VQE's in noisy environments.
- Preparation for demonstration of work is in progress.

*Machine Learning Accelerators*

- Created LSTM hardware models for SNN and ANN energy and latency comparison, supporting the generation of an ANN to SNN conversion algorithm.
  - Created models for a low-latency and energy-efficient SNN accelerator that utilizes row stationary dataflow
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**Work Experience**

**Jun-19 – Aug-21**      **Austin Powders Company**      (Remote)

*R&D Electronics Intern*

- Created an embedded system that analyzes leakage current in wires that are buried deep in the ground (used in a mining application), saving the time and cost of removing and inspecting the wires. This system is also used to support research efforts in methods of healing damaged wires.

**Aug-17 – Jan-19**

**Curtiss-Wright Nuclear Division / Enertech**      Brea, CA

*Engineering Intern*

- Created actuator Installation, Operation, and Maintenance Manuals for customer use.
  - Directed shop workers in the assembly of large EHO actuators and coordinated with production shop, management, and purchasing departments to solve production issues.
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**Awards**

- 2021 William H. Huggins Award Electrical Engineering -Johns Hopkins University