Jonathan G. Tao

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Education

Ph.D. in Electrical and Computer Engineering 2019 - 2024 (Anticipated)
with focus on Communication Electronics and Digital Signal Processing
University of California, Santa Barbara - GPA: 3.90/4.00

Bachelor of Science in Electrical Engineering March 2016
Bachelor of Science in Computer Engineering March 2016
University of California, Davis - GPA: 3.86/4.00 with High Honors

Work

Product Support Engineer - Tesla, Inc. in Palo Alto, CA February 2017 - August 2019

- Validated and maintained Tesla's Superchargers, a global electric vehicle charging network.
- Created an automation platform for engineers with Python and Supercharger telemetry to replace manual diagnostics, leading to improved customer experience and enabling rapid expansion of the network.
- Implemented fleet-wide analysis programs with data-streaming platforms and Apache Spark for real-time insights.
- Developed an electro-thermal model for high power electrical connectors and implemented it in Python for empirical design evaluation and for simulated service throughput analysis.

NPI Electrical Engineer - Internship at Keysight Technologies in Santa Rosa, CA June - August 2015

- Analyzed power and bias design of a vector signal generator with SPICE simulations, leading to a more reliable product.
- Shortened time to validate by optimizing simulation workflow with BASH and Make. Created new metrics and wrote new programs to quantify simulation quality. Wrote documentation for new and existing software.

Projects and Activities

High Speed Line Scan Camera - Personal Project December 2017

- Implemented a fast line scan camera capable of up to 9000 fps.
- Constructed an assembly comprising optics mounting and a PCB with microcontroller interface.
- Created a desktop interface for image capture using MATLAB and a USB serial interface to the camera controller.

High Frequency Transistorized Function Generator - Personal Project January 2017

- Designed and fabricated a credit card-sized 40 MHz function generator made with only transistors and passives.
- Implements sine, square, and triangular waveforms using edge rate control and bandgap stabilization, with 86 transistors.
- Created a design workflow involving SPICE simulations and a Python program for design automation and verification.

Formula SAE Student Electric - Race Car Design Team at UC Davis September 2013 - June 2015

- Designed, built, and raced an electric formula car with a team for the Formula SAE competition and won 3rd place at the SAE Electric International competition of 2014 in Lincoln, Nebraska
- Wrote firmware for high voltage vehicle systems, vehicle networking, and wireless data logging.

Skills

Software

- Python, C/C++, Lua, BASH, MATLAB/Octave, SQL, Git, Docker.
- Embedded software development for microcontrollers. Familiar with embedded communication protocols and peripheral devices in bare-metal and RTOS implementations.
- Software development with issue life-cycles, unit testing, continuous integration, and version control.
- Familiar with platform-specific IDE development workflows and UNIX-based command line environments.

Hardware

- Electronics design involving embedded systems, power, and transistorized circuits.
- Use of oscilloscopes, signal generators, spectrum analyzers, multimeters, and logic analyzers to verify circuits.
- Printed circuit board layout (eg. KiCad) with soldering, assembly, and testing of circuit boards.
- Simulation and test-driven circuit design with SPICE (eg. NGSPICE, LTSPICE) and Keysight ADS.