Jonathan G. Tao

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Education

Bachelor of Science in Electrical Engineering - March 2016
Bachelor of Science in Computer Engineering - March 2016
University of California, Davis with GPA: 3.86/4.00 (Engineering Dean's Honor List, 10 quarters)

Skills

Hardware

- Electronics design from black box ICs to transistor level circuits.
- Familiar with communication and radio signals, topologies, and circuits.
- Use of oscilloscopes, signal generators, spectrum analyzers, multimeters, and logic analyzers to verify circuits.
- Printed circuit layout (eg. KiCad) with ordering, soldering, assembly, and testing of circuit boards and components.
- Circuit simulation with SPICE (NGSPICE, LTSPICE), and a dabbling in Verilog HDL (Altera Quartus).

Software

- C/C++, BASH, MATLAB/Octave, Python, and a dabbling in C#.
- Embedded software development for Cypress PSoC, Texas Instruments MSP, Atmel AVR, and ARM Cortex. Familiar with embedded communication protocols and peripheral devices in bare-metal and API implementations.
- Development workflow with Git, Make, GCC, and platform specific IDEs (eg. Keil, Visual Studio).
- Familiar with UNIX based command line environments.
- Typesetting in LaTeX (this document was written with LaTeX) and HTML.

Previous Work

New Product Introduction Electrical Eng. - Internship at Keysight Technologies (Formerly Agilent Tech.) 2015

- Analyzed and verified power sequencing, reliability, and design of a vector signal generator with SPICE simulations to provide real-time feedback for design engineers.
- Used BASH and Make to optimize the simulation workflow. Created new metrics to quantify simulation credibility and programs to evaluate simulations with those metrics. Wrote documentation for existing and new software.

Experience and Projects

Software Defined Frequency Synthesizer - A Personal Project 2016

- A PLL-style synthesizer implemented with an AVR microcontroller and a discrete transistor VCO.
- PLL realized through a frequency counter, a PID loop filter, and a PWM DAC.
- Can reliably synthesize frequencies from 100 kHz to 1800 kHz at 200 ppm.
- Synthesized frequency is digitally set through a user interface.

Formula SAE Student Electric - Race Car Design Competition 2013 - 2015

- The team took 3rd place at the SAE Electric International competition of 2014 in Lincoln, Nebraska.
- Programmed a supervisory unit for managing power-up, shut-down, driving modes, and emergencies.
- Developed a LCD driver with font and geometry rendering for an AVR based vehicle dashboard interface.
- Wrote a PNG image to C constant conversion tool to program fonts and images into the dashboard interface.
- Built a CAN bus sensor network logger with a Cypress PSoC and wireless telemetry to a desktop application.

Proximity Boxes - Exhibited San Mateo Maker Fair Project 2015

- Created a modular, interactive surface that senses a user's proximity using modulated infrared reflections. The boxes vary the color of the several hundred LEDs on their surfaces to indicate position and proximity of a detected object.
- Used a central MSP430 controller with I^2C expanders to manage measurements of over a hundred sensors in real time.

Ludum Dare 28 - 48 Hour Game Development Competition 2013

- Within 48 hours, wrote a sandbox game from scratch about killer bunnies and holy hand grenades using C++ with the Allegro library, and then ported the game from Linux to Windows for cross-platform distribution.