

Zachary W. Walden

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Skills

–Software

Languages—C/C++ (Embedded/RTOS, PIC, STM32, AVR), Linux, Windows), Python, Assembly (AVR), Verilog (CocoTb), MATLAB/Simulink, Java (General, Android), Bash

Other—GDB, Git, Qt GUI (Python & C++) , General Linux, UML, SYSML, L^AT_EX, Agile, Docker

–Hardware

Design—Kicad(PCB), Cadence Design Entry CIS, Digital (Microcontrollers, FPGA, 7400 series), Analog (Op-Amps, Transistors, Diodes)

Verification/Validation—Cadence PSpice, Oscilloscopes

Prototyping—Breadboard, Iron & Hot Air, SMT (Experience with all package types besides BGA, QFN, & Wafer Scale) , THT

Education

–Oklahoma Christian University

Bachelor of Science, Computer Engineering, GPA 4.0/4.0, Summa Cum Laude

2018–2022

Honors & Awards

–Oklahoma Christian University

- Outstanding ECE Senior 2022
- Outstanding ECE Junior 2021
- Outstanding ECE Sophomore 2020
- The President's Scholarship 2018

Experience

–Oklahoma Christian University

Professor's Assistant—

Dec. 2020 - Jul. 2021

- Designed 2 revisions of a 3 channel adjustable full color laser diode driver board, using Kicad, to replace a 7 color driver board using an enhanced differential Howland Current Pump.
- Selected components to best meet the frequency needs of the system
- Reverse engineered 7-Color TTL driver board

Teaching Assistant: CENG-3203, CENG-3213—

Aug. 2021 - Apr. 2022

- Helped students debug hardware and software issues with 8-bit AVR Microcontrollers & 74 series logic used to control HD44780 LCD's, Keypad encoders, and parallel DACs in order to control a laser scanner system.
- Instructed students on Assembly language concepts

Teaching Assistant: ENGR-1122—

Jan. 2020 - Mar. 2020, Jan. 2022 - Apr. 2022

- Guided students in constructing an autonomous robot.
- Debugged Analog & Digital circuitry, and embedded C writtin for Microchip's 16-bit dsPIC line

–VisuALS Technology Solutions LLC

May. 2019 - Aug. 2020

Java Programmer—

- Designed a Spring REST API to authenticate a software purchase using a tablet's imei number
- Connected the authentication API to a SQL database that stored the hash of the imei
- Designed a SQL database, running on Google's Cloud
- Wrote dynamic Android U.I.
- Researched Machine Learning for text prediction (Tensorflow, Tensorflow Lite)

Projects

–8-bit 5-stage Pipeline RISC CPU

- Designed 32-bit fixed length RISC instruction set.
- Architected and implemented, from scratch, an 8-bit mostly bypassed CPU with a 5 stage integer pipeline in Verilog and run on a Xilinx Spartan 7 board.
- Implemented, and integrated a vga sync generator and a dumb framebuffer into the cpu using special instructions to write to the framebuffer.
- Wrote a simple assembler for the instruction set in Pyhton along with helper scripts to convert the assembler output into Xilinx's coe format.
- Debugged modules using testbenches written using the cocotb framework for python.

–DC/DC Boost Converter

- Designed a boost converter taking a 6V input and giving an adjustable 12V-24V output in steps of .1V using a PIC microcontroller for control.
- Used PIC Datasheet and Family Reference Manual to write register level PWM and SPI drivers.
- Wrote simple proportional-only control system to stabilize the output voltage, along with a bias adjustment to ensure the correct setpoint was reached.
- Designed and assembled a printed circuit board for the project.

–RGB Laser Scanner Controller

References
