Zachary W. Walden

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Objective

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, LaTeX, Agile, Docker*

–*Hardware*

Design—*Kicad(PCB), Cadence Design Entry CIS, Digital (Microcontrollers, FPGA, 7400 series), Analog (Op-Amps, Transisitors, 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 *Aug. 2018 - Apr. 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 meet the frequency needs in excess of 12 MHz*
- *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 enocoders, 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* *Jan. 2022 - Apr. 2022*

- *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.*
- *Used Xilinx's Integrated Logic Analyzer in conjunction with an internal reset trigger circuit to troubleshoot on chip behaviour.*

–*DC/DC Boost Converter*

- *Designed a discrete 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 stabalize 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.*
- *Led 3 person team.*

–*RGB Laser Scanner Controller*

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References