Zachary W. Walden

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Summary

Results driven Computer Engineer delivering 3+ years hands on experience with embedded technologies. Known for strong debugging and problem-solving skills with expertise in microcontroller architectures, C/C++ programming, and hardware interactions. Adept at collaborating and communicating effectively. Experience with agile development methodologies as well as proficiency in software design patterns and software development. Demonstrated ability to apply strong academic background and hands on experience in practical settings adding valuable contributions and impact to projects.

- Skilled with electronics lab equipment such as Oscilloscopes and Logic Analyzers
- Excellent hardware and software debugging skills
- Familiarity with microcontroller architectures like ARM, AVR, and PIC
- Strong proficiency in C and C++ programming

- Ability to read schematics and datasheets for low-level hardware interactions
- Good communication and collaboration skills
- Strong foundation in the design of mixed singal Printed Circuit Boards
- Expertise in software design patterns and OOP principles

Skills

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

–**Hardware**
  Design – Kicad (Schematic Capture, PCB layout), Cadence Design Entry CIS, Digital (Microcontrollers, FPGA, 74 series), Analog (Op-Amps, Transisitors, Diodes)
  Verification/Validation – Cadence PSpice, Oscilloscopes, Function Generators, Multimeters, Logic Analyzers, Network Analyzers
  Prototyping – Breadboard, Iron & Hot Air, SMT (Experience with all package types except BGA, QFN, & Wafer Scale), THT
  Other – Docker, GDB, Git, Qt GUI (Python & C++), General Linux, UML, SYSML, LaTeX, Agile

Experience

–**VisuALS Technology Solutions, LLC**   *2019 - Present*
  Open Source Developer –   *May 2022 - Present*

- Determined the cause of a display scaling issue in VisuALS' Android application, And determined what will be needed to solve the issue
- Researched running the application through WINE on Linux to provide a better development environment for open source developers
- Determined method to properly sign executable files so that windows automatically trusts the program upon installation

  Machine Learning Developer –   *Feb 2021 - Apr. 2022*

- Improved training data creation rate by 900% by translating the program from Python to C++ and switching from png to bmp
- Used Nvidia Container Runtime in docker with Tensorflow GPU to accelerate model training by 100%
- Tweaked model archtiecture to allow compilation for Google's Edge TPU, accelerating inference performance
- Reduced eye detection error rate to nearly zero by writing a heuristics based filter

  Java Programmer –   *May 2019 - Aug. 2020*

- 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. elements
- Researched Machine Learning for text prediction (Tensorflow, Tensorflow Lite)

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–Oklahoma Christian University *Jan. 2020 - Apr. 2022*

Professor's Assistant – *Dec. 2020 - Jul. 2021*

- Increased RGB laser system color capability by 20 times by designing a 3 channel modulating laser driver board
- Selected components to meet the frequency needs in excess of 12 MHz
- Designed, laid out and routed a 9V 3A buck converter
- Reverse engineered 7-color TTL driver board using a multimeter in continuity mode

Teaching Assistant: CENG-3203, CENG-3213, ENGR-1122 – *Jan. 2020 - Mar. 2020, Aug. 2021 - Apr. 2022*

- Helped students troubleshoot hardware and software issues with 8-bit AVR Microcontrollers, 74 series logic, HD44780 LCD's, Keypad encoders and parallel DACs in order to control a laser scanner system
- Instructed students on Assembly language concepts
- Guided students in constructing an autonomous robot
- Assisted students in debugging Analog & Digital circuitry, along with embedded C written for Microchip's 16-bit dsPIC line

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 - 2022*

Projects

–8-bit 5-stage Pipeline RISC CPU   View on ⌂ *Jan. 2022 - Apr. 2022*

- Designed and implemented 32-bit fixed-length RISC instruction set comprising 42 instructions
- Architected and implemented, from scratch, an 8-bit bypassed CPU with a 5-stage integer pipeline in Verilog and ran it 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
- Increased programming productivity 10 times by writing an assembler for my instruction set in Python
- Debugged modules using test benches written using the Cocotb framework for Python and viewing waveform dumps in GTKWave
- Used Xilinx's Integrated Logic Analyzer IP in conjunction with an internal reset trigger circuit to troubleshoot on chip behavior

–DC/DC Boost Converter *Sep. 2020 - Nov. 2020*

- Designed a discrete boost converter taking a 6V input and giving an adjustable 12V-24V output in steps of 0.1V using a PIC microcontroller for control
- Achieved an average of .54% error relative to the target output voltage
- 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
- Led a 3-person team, delegating responsibilities to members