Zachary W. Walden

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To whom it may concern,

As a recent graduate in Computer Engineering, I am seeking a challenging position applying my knowledge and skills designing, building and testing circuit boards. The Design Engineer I position description matches well with my capabilities.

Per my attached resume, I earned a 4.0/4.0 GPA and graduated summa cum laude. I know the value of hard work, determination and completing projects on schedule.

Following my freshman year, I began working as a Java programmer at my Professor's startup VisuaALS Technology Solutions LLC. There I worked on a REST web API using the Spring Framework. The API was used to validate system purchases, by storing the device unique IMEI number. I designed a SQL database to store hashed instances of those IMEIs. A remote management feature was also added to simplify the addition of new devices into the database.

During university, I was selected as a teaching assistant for a lower division course my sophomore and senior year and the sole teaching assistant for a series of two upper division courses my senior year. In those roles, I aided students in debugging hardware and software issues they faced while working with microcontrollers alongside Digital and Analog peripherals.

I was chosen by a professor to experiment with an RGB laser assembly over winter break. I reverse-engineered the included 7-color driver board. Using that knowledge, I found a suitable op-amp based current source for driving a grounded load, then built and tested that design using on hand components. Through testing, I found that the university's components were not fast enough. I then developed a list of speed and power requirements, using them to source suitable components. Finally, I assembled and tested 2 PCB revisions designed in KiCad. The second revision added an adjustable current set point with a dual gang potentiometer and incorporated the advanced knowledge in PCB design I acquired during the time between revisions.

This letter and the attached resume demonstrate that I am an adaptable engineer and an excellent fit for this position. I am available by phone or email, which are listed above and on my resume.

Sincerely,

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—Seeking a challenging position designing, building, and testing mixed signal systems in a team environment. A position with growth and leadership potential that utilizes my skills, knowledge and experience to provide excellence in product development and manufacturing. I will quickly contribute to the success of projects that will improve and expand the product lines for Garmin.

Skills

–Software

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

Other –Docker, GDB, Git, Qt GUI (Python & C++), General Linux, UML, SYSML, LaTeX, Agile

–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

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*

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
- 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 enocoders, 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

–VisuALS Technology Solutions, LLC

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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Projects

–8-bit 5-stage Pipeline RISC CPU *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 mostly bypassed CPU with a 5-stage integer pipeline in Verilog and ran 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 Python along with helper scripts to convert the assembler output into Xilinx's coe format
- 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 its members

References

–Jeff Bigelow, Ph.D.

- Chair, Department of Electrical & Computer Engineering, Oklahoma Christian University
- Email: jeff.bigelow@oc.edu
- Office Phone: (405)-425-5448
- Professor and supervisor for my teaching assistant positions.

–Steven P. Maher, M.Sc.

- Associate Professor, Department of Electrical & Computer Engineering, Oklahoma Christian University
- CEO, VisuALS Technology Solutions, LLC
- Email: steve.maher@oc.edu
- Office Phone: (405)-425-5407
- Professor and employer at VisuALS Technology Solutions, LLC