

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 at Garmin International's Marine division in Tulsa, Oklahoma 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 with growth and leadership potential. Utilizing my skills, knowledge and experience to provide excellence in product development and manufacturing. Contributing quickly 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, L^AT_EX, Agile

–Hardware

Design –Kicad (Schematic Capture, PCB layout), Cadence Design Entry CIS, Digital (Microcontrollers, FPGA, 74 series), Analog (Op-Amps, Transistors, 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 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

–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