YIL VERDEJA

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EDUCATION

Worcester Polytechnic Institute (WPI), Worcester, MA, May 2019
Bachelor of Science, Double Major in Electrical & Computer Engineering and Robotics Engineering, Minor in Computer Science
Honors with High Distinction, GPA: 3.93/ 4.00

Singapore American School (SAS), Singapore, Singapore, June 2015
High School Diploma
GPA: 4.1/ 4.5

International School of Ho Chi Minh City (HCMC), HCMC, Vietnam, June 2012

SKILLS

Applications: Microsoft Office, Multisim, Simulink/MATLAB, Fusion, Cadence, Altium, Eagle, Solidworks, Unity
Programming Languages: Java, Python, C/C++, C#, HTML/CSS, JavaScript
Web Development: NodeJS, ExpressJS, Flask, Jquery, Bootstrap, SQL, VueJs, ReactJS, GCP, AWS
Technologies: Git, HTTP, REST, JSON
Hardware: Verilog for synthesis, modeling, simulation and testing
Operating Systems: Linux/Unix, Windows
Equipment: Soldering (Through hole and Surface mount), Electronic Lab Instruments, Microcontrollers, Power and Hand tools, Xilinx FPGA
Conceptual: Filters, Diodes and Transistor Applications, Analog integrated circuit design, Control Systems, Operational Amplifier and Oscillators design, DH parameters and Jacobians, Robotic Navigation and Communication, Advanced digital system design with FPGAs, Power Engineering, Software Engineering, Real-Time Embedded Systems, and Machine Learning
Foreign Languages: Fluent in Spanish
Certificates: Advanced Open Water Diver, and Solidworks Associate Mechanical Design

WORK EXPERIENCE

Embedded Software Engineer, Ampd Energy, Hong Kong   September 2021 - January 2023
- Designed user-friendly DWIN interfaces in Figma & implemented robust embedded software in C for the Enertainer's external hardware machine interface.
- Streamlined firmware testing process by 75% through comprehensive test plans and regular validation of quarterly releases for the Enertainer system.
- Collaborated with test engineers to develop specialized tools for the Battery Pack BMS, optimizing testing time for manufacturers and ensuring accurate development of all units.
- Developed Python libraries & tools to improve configuration management, automate system changes, and improve communication with hardware components
- Provided detailed technical documentation for effective communication and support.

Software Engineer Intern, Ampd Energy, Hong Kong   February 2021 - September 2021
- Streamlined the data-logging process reducing setup time for field engineers by 30%.
- Created a configuration management tool in Python to efficiently modify Enertainer parameters, enabling easy on-site and remote troubleshooting.
- Implemented a seamless method for uploading and downloading configuration files during testing and troubleshooting, improving efficiency by 80%.
- Developed customized in-house tools for the electrical engineering, data science, and sales teams, enhancing project support, data gathering and analysis processes.
- Engineered a web application with Javascript, VueJS, and the Google Cloud Platform, enabling effortless retrieval, download, and analysis of Enertainer data for troubleshooting purposes.
- Assisted field engineers in maintaining the Enertainer by identifying root causes of errors and providing on-site solutions, resulting in 40% reduction in downtime.
- Authored comprehensive documentation to foster clear communication between software and field operations, minimizing misunderstandings.

Online Coding Instructor, Self-employed   June - September 2020

- Taught five project-based courses in game development (Minecraft, Roblox, and Scratch) and app development (MIT App Inventor) to 10 classes of up to four students aged 8 to 13.
- Designed two curricula of 12 classes (with slides and projects) to teach students about Bootstrap and NodeJS.

Test Engineer Intern, AiSight, Berlin, Germany   July 2019 - March 2020
- Managed deployment of up to 50 sensor nodes, ensuring quality control and functional testing
- Built a fault simulation machine with 5 unique faults, utilizing an AC motor and custom-made water pump system, to test hardware and software capabilities for fault detection and prediction.
- Developed an Arduino-controlled variable frequency drive (VFD) PCB using EAGLE software to control the speed of a single-phase AC motor on the simulation machine.
- Enhanced sensor nodes' vibration measurement capabilities through automated tests using Analog Discovery 2 (AD2) and oscilloscope comparisons, optimizing mounting methods and determining optimal vibration transmission materials.
- Established a comprehensive testing environment for the mechanical shaker, including research, acquisition of necessary equipment, and development of automated testing procedures, resulting in streamlined data collection and analysis of node performance.
- Successfully managed lab operations and inventory, ensuring smooth workflow and availability of necessary resources.
- Directed and produced an installation video, serving as a reference for installation procedures and enhancing user experience.

WPI Electrical Engineer Senior Tutor, Worcester, MA   March 2018 - May 2019
- Worked as a senior tutor in the ECE2010 and ECE2019 WPI courses to teach and mentor students in basic electrical engineering concepts and filter concepts through labs, tutoring, and homework.
- Maintained labs, advised in help sessions and grading

Electrical Engineering Intern, Philips – Connected Sensing Venture, Cambridge, MA   May - August 2018
- Designed a test fixture PCA for a wearable biosensor using the DipTrace schematic capture and PCB layout tool.
- Produced and maintained documentation on the electrical specification requirements and verification protocols of the test fixture PCA, and authored a report on how to test the wearable biosensor for internal defibrillation.
- Populated multiple test fixture PCBs and troubleshooted each board to verify its functionality.

PROJECT EXPERIENCE

Valentine's Worldwide Love Counter, Personal   February 2021
- Created a serverless VueJS app with Firestore that counts the total clicks given to the heart.

Vue Meatify, Personal   February 2021
- Created a serverless VueJS app with Firestore of the Meatify webapp.

Ben's Wildlife Reserve, Personal   December 2020
- Designed a site with Figma, and created a static site using HTML, CSS and Bootstrap.

Meatify, Personal   December 2020
- Designed a web app with Figma, and developed the front end in Bootstrap and the backend with NodeJS and Firestore.

Sensor Display with an ATMega2560, Personal   September 2020
- Created a PCB in Eagle and Easy EDA utilizing an ATMega2560 and an OLED display that reads information from an external temperature sensor and displays it on the OLED screen.
- Programmed the MCU in C using the Arduino IDE
- Built a 3D enclosure in Fusion 360 to house the Sensor Display PCB

Digital Oscilloscope with a Real-Time Embedded System, WPI   March - May 2019
- Created a versatile one mega sample per second oscilloscope that could read a waveform sampled by an ADC.
- Implemented selectable trigger slopes, adjustable voltage and time scales, spectrum mode, frequency and CPU Load measurements.
- Applied ISRs, RTOS objects (Task, Hwi, Clock, Semaphore, Mailbox) and a DMA to run computationally intensive tasks without slowing down the user interface, and to deal with shared data and other inter-task communication.

Firefighting Remote Exploration Device, WPI   August 2018 - May 2019

- Designed and built a compact robot that can navigate a structural fire environment, monitor temperature and heat flux, and wirelessly communicate data to firefighters.
- Managed a group of five engineers by holding weekly meetings, designing a timeline and holding people accountable for their work.

AWS Rana Scheduler, WPI   November - December 2018
- Designed and implemented an online scheduler application using Amazon Web Services (AWS) that allows participants to create meetings in schedules created by organizers.
- Designed and developed major features for the website's frontend using HTML/CSS, JavaScript and the REST API protocol.
- Connected that AWS API gateway and deployed the backend to AWS lambda functions using a serverless python web service and the Flask microframework.
- Held weekly scrum meetings, and optimized and refactored the code for scalability and functionality.

Klotski Application, WPI   9 - 12, November 2018
- Built a Klotski Puzzle Game with Java using an Entry-Control-Boundary (EBC) model and Test Driven Development (TDD)

Quadcopter and Hook Mechanism CAD, WPI   August - October 2018
- Designed a quadcopter with a hook mechanism in Solidworks with more than 6 unique parts and 2 subassemblies.

Thermistor Controlled LED Blinker PCB, Personal   November 2018
- Designed and created a PCB on Diptrace using an astable oscillator with a 555 timer

Moving block, Wave generation and Testing using FPGAs, WPI   15 - 30, September 2018
- Designed and implemented an SPI interface for a DAC module using a shift register to create sine, triangle and sawtooth waveforms.
- Programmed a VGA monitor to display a moving green block controlled via 4 push buttons by implementing a state machine to debounce each of the buttons.

Light Sensor and VGA monitor Display using FPGAs, WPI   5 - 15, September 2018
- Designed and implemented an SPI interface for a light sensor module using an MMCM and multiple sequential circuits (counters, and shift-registers)
- Programmed a VGA monitor to display a series of different static patterns using switches.

Autonomous Robot Navigation, WPI   March - May 2018
- Designed an autonomous navigation system for the TurtleBot3 using Python and ROS
- Implemented forward and inverse kinematics, a real-time A* path planning algorithm, a Kalman filter to optimize navigation through a dynamic environment and SLAM

Robotic Elbow Manipulator, WPI   January - March 2018
- Implemented an automated robotic sorting system to localize certain objects within its workspace, pick them up, and classify them by weight or appearance with load sensors using computer vision, trajectory generation and motion planning

Gomoku Artificial Intelligence, WPI   January - March 2018
- Developed and implemented an AI program in Python that plays Gomoku against an opponent using the minimax algorithm with alpha-beta pruning to construct a search tree for calculating the most favorable and optimal next move.
- Designed evaluation and heuristic functions to improve the performance of the algorithm.
- Competed against sixteen teams and ranked first in the Gomoku AI tournament.

Nobi Wildfire Detection System, WPI   October - December 2017
- Designed and developed a wildfire detection system that utilizes solar energy to sense temperature, humidity and gas level parameters
- Established a wireless communication via a Bluetooth Low Energy (BLE) mesh network to relay the information obtained from the sensor to a central peripheral device
- Competed against six teams and ranked in first in the Robert H. Grant Invention Awards

Electric Vehicle Charger Power System, WPI   10 - 15, December 2017
- Designed a battery charger in Simulink for an electric vehicle using a PID controlled thyristor bridge rectifier, an LC circuit to reduce ripple size, indication lights to specify the amount of charge stored and a relay with hysteresis to disconnect the battery once fully charged

Teaching Relative Pitch through Video Games, WPI   June - August 2017
- Researched, designed and created a musical game prototype to teach people the concept of relative pitch
- Created the game using JavaFx for the backend, and JavaFX Screen Builder for the frontend
- Interviewed 5 professionals and surveyed a group of 39 people with varying levels of musicianship for feedback

Embedded Computing in Engineering Design, WPI   6 - 15, September 2016
- Designed and programmed a gas pump interface using the MSP 430 Microcontroller, where the user had the ability to select different types of gas grades, to pump gas, and to use a "top-off" method

NOTABLE LAB EXPERIENCE

Simulated each circuit using Multisim and/or Cadence to verify measured results

CMOS Operational Amplifier, WPI   8 - 13, December 2017
- Measured the closed loop-performance of an op-amp designed from individual MOSFETs
- Combined major circuit techniques to build the op-amp: Differential Pair, Common Source Amplifier, Current Source with "bias rail", Current Mirror Load, and Compensation

MOSFET Common source Amplifier with Active Load, WPI   20 - 24, November 2017
- Measured the performance of the common source amplifier with an active (current source) load to confirm its high gain and high input resistance

BJT Common Emitter Amplifier, WPI   13 - 20, September 2017
- Used a voltage divider to bias a BJT common emitter amplifier, and dramatically increased the gain of the amplifier by using an emitter bypass capacitance

Power Supply Microelectronics, WPI   23 - 30, August 2017
- Built a regulated power supply using a transformer, a full wave rectifier, a filter capacitor (to meet ripple voltage specification), and a 5V voltage regulator IC to reduce the outlet voltage of 120 V_{RMS} to a constant DC voltage of 5 V

ONLINE COURSES

The Ultimate MySQL Bootcamp: Go from SQL Beginner to Expert, Udemy, Colt Steele   Present
Learn to Design your own boards (Altium), Udemy, Robert Feranec   Present
Mastering Microcontroller with Embedded Driver Development, Udemy, FastBit   Present
The Complete 2020 Web Development Boot Camp, Udemy, Angela Yu   2020
Starting with Altium Designer, Udemy, Robert Feranec   2020
Learn the Art and Science of PCB Design with Eagle, Udemy, Amit Rana   2019