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, PSPICE netlist, Cadence, DipTrace, Eagle, Solidworks, Unity
Programming Languages: Java, Python, C/C++, C#, HTML/CSS, JavaScript
Web Development: NodeJS, ExpressJS, Flask, Jquery, Bootstrap, SQL
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

Test Engineer Intern, AiSight, Berlin, Germany July 2019 - March 2020

- Managed the deployment of nodes:
  - Assembled, tested and deployed up to 50 sensor nodes.
  - Created a quality control process to test the functionality of each node before installing them in a factory
- Built a machine to simulate faults:
  - Created and assembled a machine with up to 5 unique faults by coupling an AC motor to a custom-made water pump system
  - Used the simulation machine to test the node's hardware and software capabilities in detecting when a fault occurs and in predicting when a fault will damage the machine
- Created an arduino-controlled variable frequency drive (VFD)
  - Built a 2-layer PCB using EAGLE to control the speed of a single phase AC motor on the simulation machine
- Improved the sensor nodes vibration measurement capabilities:
  - Completed various automated tests with the Analog Discovery 2 (AD2) and by comparing the sensor's output signal with measurements from an oscilloscope
  - Determined the best mounting method to fix the sensors to the machines
  - Researched, analyzed and determined the best materials to use to transmit vibrations to the sensor node
- Directed and produced an installation video that will be used as a reference to a professionally done video.
- Set up an environment to do testing on the mechanical shaker:
  - Researched and obtained a mechanical shaker to meet the testing needs of the node
  - Created an automated testing procedure with the AD2 to test the node and collect data using a frequency sweep
  - Built an insulation box to contain the high frequency sounds of the mechanical shaker
- Managed the lab and its inventory
- Participated in daily SCRUM meetings and interviewed potential employees

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

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 Complete 2020 Web Development Boot Camp, Udemy, Angela Yu Present

The Ultimate MySQL Bootcamp: Go from SQL Beginner to Expert, Udemy, Colt Steele Present

Complete C# Unity Developer 2D: Learn to code making games, Udemy, Rick Davidson 2020

Learn the Art and Science of PCB Design with Eagle, Udemy, Amit Rana 2019