Michael Hernandez

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Summary

Michael is currently a Senior at Oregon Institute of Technology in Wilsonville studying electrical engineering. He is primarily interested in microcontrollers, and programming. He also holds a bachelor's degree in biology with a minor in chemistry from Portland State University where he graduated Cum Laude in 2014.

Skills

C++	HTML	Japanese (N3 Level)
LaTeX	MATLAB	Medical Terminology
Microsoft Office Software	PCB Design	Technical Writing

Education

Bachelor of Engineering: Electrical Engineering | Oregon Institute of Technology | June 2020

Michael is currently working toward a second bachelor's degree in electrical engineering at Oregon Institute of Technology in Wilsonville, Oregon. He is scheduled to graduate in June of 2020.

Coursework

Circuits – A year-long course sequence designed to give the student a thorough understanding of basic electrical circuit theory, this course covers voltage and current relationships and fundamental methods of circuit analysis. A wide variety of topics in electrical circuit parameters were covered.

Computer Science I – Introduction to computer algorithms, software design methodologies, and computer program design process were taught. Correctly use variables, constants, functions, if-then statements, while loops, for loops, and switch statements were emphasized, as were the key characteristics and benefits of object-oriented programming. This course was taught using C++ as the programming language.

Control Systems Engineering – An introduction to the design and compensation of linear control systems using a complex frequency-domain approach. Feedback control of first- and second-order systems, controller sensitivity, disturbance rejection, stability, frequency response methods. Introduction to state-space modeling. Computer simulation of feedback control systems.

Digital Signal Processing – Introduction to signals and systems. Spectral analysis techniques. Fourier Series and the continuous-time Fourier transform (CTFT). Discrete-time Fourier transform (DTFT) and digital Fourier transform (DFT). Computational spectral analysis using the FFT. FIR and IIR filters. Z-transform. Practical implementation of digital filters and computational spectral analysis using MATLAB.

Engineering Programming – MATLAB and LabVIEW developing environments were introduced as tools to solve engineering problems. Development of applications in MATLAB and virtual instruments in LabVIEW were also covered.

Geometric Optics - Reflection and refraction at plane and curved surfaces and imaging properties of lenses.

Introductory & Advanced Microcontrollers – Basic principles of microcontrollers were introduced and put into practice using an ATMega328P microcontroller. Topics covered included serial communication, Bluetooth, internal structures, timing, interrupts, A/D conversion, PWM, and interfacing with peripheral devices.

PCB Design – Design techniques and industry standards for PCB design were demonstrated using Mentor PADS software. This course cumulated in ready to submit Gerber files for a uniquely designed Arduino Uno.

Solid State Devices – Crystal properties and the growth of semiconductors were discussed at length. P-N junctions were taught, particularly as they relate to FET and BJT technology.

Bachelor of Science: Biology | Portland State University | June 2014

Michael graduated from PSU with a 3.71 GPA. He earned his degree in biology and a minor in chemistry. In 2010 he was awarded the IFC foundation scholarship, and in 2009 he received the competitive Oregon Health Career Center & Kaiser Permanente Scholarship.

Projects

Vaccine Dispenser | September 2019 – Present

Designing and creating a temperature regulated vaccine dispenser. This device will be small enough to fit in a backpack and be solar powered so that it can be used in remote areas without reliable power. It will have an LCD screen which can display user input as well as the remaining number of vaccines inside. It will also feature username input and password protection to prevent unauthorized use. Finally, it will keep a log of all dispensed units stored on an SD card. This project uses an ATMEGA2560 programmable microcontroller, and is written in C++.

Bluetooth Robot | January 2019 – March 2019

Constructed a robot which has both autonomous driving functionality and Bluetooth controlled drive. This project implemented the use of a servo to control a gripper to move plastic balls, and receive input from a rotary encoder to automatically adjust the speed of four independent DC motors. The entire robot was designed to run off of a programmable ATMEGA2560 microcontroller.

Power Supply Design | Dec 2018

Created a functional power supply for a project as part of an electronics course that reduced a line voltage from a common wall outlet to a usable 0.5 mA and an adjustable output voltage of 5 - 10 volts.

Molecular Biology Research | Sep 2013 – June 2014

Added a tag to a protein in *e. coli* bacteria that would cause all targeted proteins to be brought to an area of the cell for selective degradation when the cell was exposed to lactose. This project involved experimental design and literature review.

Harmonic Scalpel Poster Presentation | July 2013

Utilized online research methods and journal article review to create a poster on the physics behind how harmonic scalpels work, as well as their common usage in surgery. The resulting poster was presented at OMSI to the general public as part of a one-day exhibit on medical equipment.

Curriculum Development | June 2012 – Aug 2012

Developed, and wrote directions for exercises to be used in an introductory physics teaching laboratory designed to direct student learning in developing a mastery of the concepts of Fourier transform and using simple oscillating motion to model a person's walking gait with the assistance of computer software.

Employment

Product Quality Co-Worker | IKEA | July 2019 – Present

After working for two years as a customer service coworker at IKEA, Michael was promoted to work in the product quality department. In product quality Michael sorts through returned merchandise to determine if it can be sent back to stock, resold in IKEA's clearance department, or discarded. He will also assign prices for items to be sold on clearance in accordance with IKEA's internal protocols and pricing structure. He also spends a considerable amount of time building IKEA furniture such as sofas and dressers to be sold on clearance or put out for display. Each role in the product quality department emphasizes inspecting all merchandise for safety.

Customer Service Co-Worker | IKEA | June 2017 – July 2019

At IKEA, Michael primarily worked in logistics with the home delivery department scheduling customers who desired to utilize the home delivery service. While at IKEA Michael's input has been actively sought out by management for suggestions on how processes within home delivery can be improved and streamlined to ensure the accurate and timely delivery of customer's orders.

Assistant Language Teacher | Aomori Prefectural Board of Education | Aug 2014 – Aug 2016

Michael taught English to 10th grade high school students at Aomori Nishi public high school in rural Aomori Prefecture, Japan. While there he would also regularly make visits to a special needs school for physically and mentally disabled students. He also managed and planned weekly activities for the school's English club.