**Hector Lopez** 

5-2021

#### **Education**

Bachelor of Science in Mechanical Engineering & Minor in General Mathematics

California State Polytechnic University, Pomona

# <u>Skills</u>

SolidWorks • Welding • CNC Machinery • MatLab • SimuLink • Arduino • C++ • Soldering • Oscilloscope • Prototyping • Computer IT • Fault Tree Analysis • Failure Mode and Effects Analysis • Project Management • Quality Management • Fluent in Spanish

# Work Experience

Mechatronics Engineer, Freelance

- Designed and constructed 7x1.5x1ft 3 axis polar 3D scanner to automate scanning of clothing for virtual reality try-on experience.
- Designed for stepper motors, lead screws, worm gear, and electrical power supply to incorporate with logic circuitry of the 3D scanner.
- Directed vendors to fabricate customized design parts for client's project.
- Mechanical Engineer, VersaProducts, INC.
- Implemented the use of Business and Institutional Furniture Manufacturers Association (BIFMA) standards as part of company product design process.
- Drafted detailed engineering and assembly blueprints to issue patents for the company's manufactured products.
- Designed a \$699.00 top selling table, a \$839.00 split surface table, a car rack, a mini barbeque cart, among other products.
  Executed mass-production manufacturing of tables by creating computer numerical control programs using Metacam, and
- BiesseWorks and by coordinating with assembly line workers.

# Leadership Experience

Electronics Lead, Cal Poly Universities Rose Float	2-2019 - 2-2020
Assistant Electronics Lead, Cal Poly Universities Rose Float	2-2018 - 2-2019
Construction Team Member, Cal Poly Universities Rose Float	2-2017 - 2-2018

- Managed two Electronics Assistants and supervised three volunteers to ensure completion of electronic tasks.
- Won the 2019 Extraordinaire Award and the 2020 Director Award of the Pasadena Rose Bowl Parade in collaborative work between Cal Poly Pomona and Cal Poly San Luis Obispo's Design, Decoration, and Engineering departments.
- Designed & fabricated four hydraulic-motor-driven tentacles for an Octopus, a set of pneumatic-cylinder-driven ailerons, a rudder, and elevators systems for an airplane, and a hydraulic-cylinder-driven animatronic head for the annual float entries.
- Troubleshooted mechanical issues of mechatronics' designs by utilizing SolidWorks and small-scale prototypes.
- Programmed animatronics by regulating hydraulic system's flow utilizing string potentiometers, LabView, and real-time Controller Reconfigurable IO Modules.

#### Supply Chain Manager, Cal Poly Pomona Robotics Club

- Administer club's limited budget to acquire electrical and mechanical hardware components in a timely manner.
- Introduced interactive spreadsheet for budgeting and tracking process, facilitating operations for future club members.
- Increased number of club attendees from 4 to 20 by prioritizing more one-to-one interaction with attendees.

## **Projects**

## Affordable Proportional–Integral–Derivative (PID) Controls Testing Bench

- Co-designed, produced, and improved affordable \$100 open loop "Ball on Lever" and closed loop "Propeller Pendulum" systems to integrate as experimental tools in universities' and high schools' PID activities.
- Ensured quality of PID experiments by comparing the data processing rates of a commercial test bench, a genuine Arduino and a generic Arduino board.
- Showcased systems and research at the 2021 American Society for Engineering Education (ASEE) Virtual Annual Conference. Engineering Computational Methods 9-2020 – 12-2020
- Coded and animated 3 sets of double pendulums with slight alterations to parameters in order to demonstrate a chaotic system.
- Simulated motion of Three Body Problem and a spring and damper system using MATLAB's Simulink.
- Coded simple static structure program that accepts a variety of input parameters to render a display of the structure with internal forces of each member, the structure's reacting forces, and the angle and direction of initial force.

#### **Reverse Pendulum**

- Co-created a reverse pendulum PID system to balance a mass up in the air without letting the mass fall onto the ground.
- Incorporated the use of a stepper motor, Arduino, a timing belt rail system, and concepts such as close/open loop systems, Fourier's transformations, Root Locus, and Laplace transform to accomplish project goals.
- Directed a team of 3 students to machine parts within the given timeline.

1-2016-6-2017

9-2019 - 12-2019

1-2020 - 7-2021

8-2021 – On going

12-2020 – On going