Luisa Chiu
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EDUCATION

California Polytechnic State University, San Luis Obispo, CA — Graduated September 2024

- Bachelor's and Master's Degree in Mechanical Engineering, Concentration in Mechatronics, 3.86 GPA
- Minor in Computer Science

PROJECTS

Master's Thesis: Dynamic Maze Puzzle Navigation using Deep Reinforcement Learning — Sep 2023 – Sep 2024

- Developed a computer vision robot pose estimation algorithm using OpenCV and ArUco markers
- Conducted research on autonomous mobile robot navigation and deep reinforcement learning algorithms
- Implemented Deep Q-Learning in a maze environment simulation using TensorFlow, matplotlib, NumPy, etc.

Algorithm Development for an Autonomous Mobile Robot — Sep 2023 – Dec 2023

- Developed code in C for a microcontroller to interact with IR sensors, range sensors, and servo motors
- Created simulation for a robot to localize itself and knock over target towers using Monte Carlo localization
- Developed line-following algorithms for a robot using P-control and convolutional neural networks (CNN)
- Designed, modeled, and 3D printed sensor brackets using SolidWorks and a Prusa printer

Automated Produce Slicer Machine — Sep 2022 – Dec 2022

- Developed code in C++ for an ESP32 microcontroller to interact with motors, sensors, and limit switches
- Ensured accurate timing execution through implementation of a real-time operating system using Free RTOS
- Collaborated on a PCB (printed circuit board) designed for project application using Autodesk Eagle
- Designed 3D printed parts through CAD modeling with emphasis in tolerancing for clearance and press fits

System Dynamics Vehicle Model Simulations (MATLAB and Simulink) — April 2022 – June 2022

- Modeled quarter-car suspension system using state-space and block diagrams to simulate system response
- Modeled a permanent magnet DC motor using part specifications and simulated system response for 3 load cases
- Modeled and analyzed an electric vehicle powertrain and its associated longitudinal motion
- Optimized performance characteristics of the simulated vehicle to maximize fuel efficiency and power output

Ball Balancing Platform — Sep 2021 – Dec 2021

- Simulated closed-loop motor speed control using MATLAB and Simulink to efficiently find P-controller gains
- Developed Python code for STM32 microcontroller to interact with motors, IMU (I2C), and resistive touch panel
- Designed the multitasking program structure through implementation of task diagrams and finite state machines

EXPERIENCE

Applications Engineering Intern, **Yaskawa America, Inc. – Drives and Motion Division** — July 2022 – Sep 2023

- Developed function blocks for interpolation based on path percentage using SLERP and linear interpolation
- Tested function blocks by developing a path calculation function for a pick and place robot application
- Created and executed an SFC (Sequential Function Chart) program to interact with a 6-DOF robot arm
- Audited code by analyzing and testing existing function block code and documenting bugs and inconsistencies
- Programmed PLC's using MotionWorksIEC to develop over 200 test cases for a new controller release
- Assembled test stand for controller prototype using motors, servo drivers, and other electronic components

Instructional Student Assistant, **Cal Poly SLO Mechanical Engineering Department** — Sep 2020 – Dec 2022

- Evaluated homework assignments for over 100 students for ME 236: Measurement and Data Analysis
- Coordinated with instructor to improve teaching and incorporate feedback on student performance

ACTIVITIES

Member, **Society of Women Engineers** — Sep 2018 – present
Member, **Cal Poly ASI Intramural Sports Teams (volleyball, flag football)** — Sep 2018 – June 2023
Orientation Leader, **Cal Poly SLO New Students and Transitions: Week of Welcome** — Jan 2021 – Sep 2021

SKILLS

Programs: SolidWorks, MATLAB (Simulink), Autodesk Eagle, LTspice, AutoCAD, Microsoft Office, Arduino
Programming Languages: Python, C++, C, Java
Other: Computer Vision, 3D Printing, Drafting (GD&T), Prototyping, Manufacturing (CNC mill, lathe, welding)