

## LUISA CHIU

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### EDUCATION

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California Polytechnic State University, San Luis Obispo, CA Expected Graduation: June 2024

- Bachelor's and Master's Degree in Mechanical Engineering, Concentration in Mechatronics, 3.82 GPA
- Minor in Computer Science

### PROJECTS

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

- Developed a robot pose estimation algorithm using OpenCV and Aruco markers
- Conduct research on autonomous mobile robot navigation and deep reinforcement learning algorithms
- Implement Deep Q-Learning in a simulated maze environment using Python

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

- Developed code in C for an STM32 microcontroller to interact with IR sensors, range sensors, and servo motors
- Created program 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 3-D 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 FreeRTOS
- Collaborated on a PCB (printed circuit board) designed for project application using Autodesk Eagle
- Manufactured project components using a plasma cutter, angle grinder, and other woodworking tools
- Designed 3D printed parts through CAD modeling with emphasis in tolerancing for clearance and press fits

**Interdisciplinary Senior Project: Bike to the Future** Sep 2021 – June 2022

- Designed sensor feedback system with a focus on usability and functionality for a visually impaired biker
- Created and iterated 3D-CAD models of project assembly containing over 20 parts using SolidWorks
- Produced a comprehensive instructional and informative video to guide customer in product assembly and use

**Ball Balancing Platform** Sep 2021 – Dec 2021

- Simulated closed-loop motor speed control using MATLAB and Simulink
- 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

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*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 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

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*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

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**Programs:** SolidWorks, MATLAB (Simulink), Autodesk Eagle, Fusion 360, AutoCAD, Microsoft Office, Arduino

**Programming Languages:** Python, C++, C, Java

**Other:** Computer Vision, 3-D Printing, Drafting (GD&T), Prototyping, Manufacturing (Mill, Lathe, CNC Machine)