

# Jack Butler

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Master's-level mechanical engineer specializing in robotic and mechatronic systems. Versatile full-stack engineer proficient in all aspects of robotics development, from PCB design and precision machining to software implementation. Seeking to collaborate with a passionate team to tackle complex, unconventional problems.

## Education

### California Polytechnic State University - Graduation Expected March 2025

M.S. Mechanical Engineering

2023-2025

San Luis Obispo, CA

### California Polytechnic State University

B.S. Mechanical Engineering, Mechatronics Concentration

2019-2023

San Luis Obispo, CA

## Experience

### M.S. Researcher

M.S. Thesis, *Quadrupedal Robot Control (Paper currently untitled)*

Sep. 2023 – Present

San Luis Obispo, CA

Design and implementation of a control algorithm optimized for fluid gait transitions. The transition between gaits (walking, trotting, bounding, etc.) in a legged robot is a critical moment of instability. By designing an intelligent gait scheduler and a whole-system control strategy to go with it, it can be ensured that the most efficient gait is being selected, and that the robot can transition to that gait with maximum stability.

- Developed and implemented a ROS2 system for controlling a quadrupedal robot
- Designed power and communication electronics for a quadrupedal robot
- Developed a development structure centered around the Nvidia Jetson Orin AGX Nano and STM32 embedded microcontrollers
- Developed a documentation and onboarding package for the Cal Poly Legged Robotics Group

### Undergraduate Researcher

Cal Poly Legged Robotics Group, Multiple Projects

July 2021-2023

San Luis Obispo, CA

- Designed a test stand for gait switching in quadrupedal robots
- Developed multiple controllers for a single-leg vertically constrained hopping robot

### R&D Mechanical Engineering Intern

Hunter Industries

Summer 2020

San Marcos, CA

- Developed a stator valve for high-performance sprinklers
- Engaged with daily testing and validation of prototypes
- Utilized HP MJF 3D printing for accurate rapid prototyping

### R&D Electrical Engineering Intern

Mu-Tron Effects

Summers 2018 and 2019

Cardiff, CA

- Developed analog signal-processing circuitry for guitar effects pedals
- Set up tooling and manufacturing processes for in-house PCB and sheet metal manufacturing

## Publications/Patents

### Novel Water Saving Device for Nursery Irrigation

PATENT PENDING

## Technical Skills, Language Skills, and Interests

**OS:** Debian and Arch Linux, Windows

**Programming Languages:** C/C++, Python, MATLAB

**Libraries:** ROS2, ACADOS, CasADi

**Communication Protocols:** I<sup>2</sup>C, SPI, CAN, UART

**3D and PCB CAD:** Solidworks, Fusion360, KiCAD

**Writing:** L<sup>A</sup>T<sub>E</sub>X, Office

**Languages:** English (Native), Spanish (Conversational)

**Interests:** High Order Systems, Underactuated Systems, Machine Learning Control, System Dynamics, Music, Surfing