# B. Joshua McConkie

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## EDUCATION

**Brigham Young University** Apr 2028
BS, Applied & Computational Mathematics (Signal & Systems Emph.) Provo, UT
- Major GPA: 4.00/4.00

## SUMMARY

ACME student pursuing a PhD track in control and autonomous robotics, focused on state estimation, dynamical systems, and real-time control implementation.

## TECHNICAL SKILLS

- Controls & Robotics; Optimization; PID tuning; PCB/CAD Design; Computer Vision
- Programming: C++; Python; Arduino C; Julia (research codebase).
- Tools & Platforms: Git; Linux; Fusion 360.

## SELECTED PROJECTS

**Ball-balance Table (current)**
- Designed a 2-DOF table to stabilize a rolling ball using a closed-loop system & PID controller (50 Hz).
- Implemented OpenCV for centroid tracking and serial communication to an Arduino; currently evaluating Kalman Filter implementation.

**Cart-Pole Simulation**
- Derived equations of motion for an under-actuated cart-pole system and linearized model about its upright equilibrium.
- Simulated PID controllers in MuJoCo to study stability and sensitivity.

**Linux Server Management**
- Maintained a personal server hosting self-contained services (budgeting, password management, VPN) via Docker Compose, secured with Nginx Proxy Manager and Cloudflare DNS.

**Obstacle-Avoiding Robot**
- Interfaced multiple sensors/motors with Arduino Nano for light/object detection and avoidance
- Designed/implemented from-scratch 2-layer PCB and CAD body for final build.

## EXPERIENCE

**BYU Electrical Engineering Department | (current)** Nov 2025
*Quantum Photonics Assistant Researcher*
- Optimizing hybrid Gaussian/non-Gaussian quantum optics state engine using Julia coding language.

**BYU Economics Department** Jan 2024 - Dec 2025
*Research Assistant*
- Estimated treatment effects using instrumental variables and high-dimensional fixed effects; validated robustness with clustered and heteroskedasticity-robust inference.
- Wrote reproducible Python/Stata pipelines for end-to-end data prep and analysis.