FELIPE RIBEIRO

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EDUCATION

University at Buffalo, State University of New York — **Buffalo, NY**
Bachelor of Science in Mechanical Engineering — *Expected May 2027*
Relevant Coursework: Mechanics of Solids, Statics, Dynamics, Mechanics of Materials, Machines & Mechanisms, Finite Element Analysis, Control Systems, Manufacturing Processes, Thermodynamics, Heat Transfer

TECHNICAL SKILLS

Robotics & Embedded: Arduino, ESP32, Raspberry Pi, PID & Kalman filtering, Gimbal systems
Programming & Tools: C++, MATLAB, Python, MS Office (Excel, Word, PowerPoint)
CAD & Analysis: Fusion 360, SolidWorks, AutoCAD, Prusa Slicer, FEA

ENGINEERING EXPERIENCE

UB ASME — IAM3D 2026 Rover Team — **Buffalo, NY**
Electronics Lead — *August 2025 – Present*
- Leading electronics integration for a 3D printed rover competition, coordinating across the mechanical, electrical, and software sub-teams; evaluated on payload delivery effectiveness against competing colleges.
- Designed, wired, and documented (schematics + test procedures) a multi-battery power system, increasing rover motor performance by ~25% while regulating voltage for 6.25–8.25V high-torque servos.
- Programmed Arduino and ESP32 to translate RC receiver signals to ESC-driven DC motors, servos, relays, and onboard subsystems.
- Built and integrated a servo-actuated excavator scoop system with FPV camera support, laser alignment assistance, and custom 3D-printed protective enclosures.
- Competed with the IAM3D rover team at the EFX engineering competition (University of Central Florida).

Four-Bar Linkage Prosthetic Hand — **Buffalo, NY**
Personal Project — *June 2026 – Present*
- Designing a prosthetic hand in which each finger is driven by a four-bar linkage that converts a single 180° servo's rotation into controlled finger curl via a fishing-line tendon for inward and outward articulation.
- Modeled and validated the finger linkage kinematics in PMKS+ to tune range of motion and mechanical advantage before physical prototyping.
- Currently designing and 3D-printing individual finger assemblies, integrating servo actuation and tendon routing into the hand structure.

Self-Balancing Inverted Pendulum Robot — **Buffalo, NY**
Personal Project — *February 2026*
- Built a 3D-printed two-wheel inverted pendulum robot using (Arduino, MPU-6050, DRV8833), cutting balance sway from +8°/−6° to a steady ±4.5° by adding mass to raise inertia and rigidly mounting the IMU to reduce tilt-estimate noise.
- Fused accelerometer and gyroscope data via a two-state Kalman filter feeding a PID loop (Kp 90, Ki 0.2, Kd 6) for real-time balance and disturbance rejection.
- Through structured experimental testing and data analysis, diagnosed mismatched startup thresholds between the two TT gearmotors; measured each motor's activation point and used the map() function to scale PID output across both motors' usable PWM range, giving the controller finer resolution and better wheel response.

2-Axis Gimbal System — **Buffalo, NY**
Personal Project — *March 2026*
- Modeled and 3D-printed a 2-axis gimbal system for an FPV camera using servo motors controlled via remote control.
- Implemented filtering (EMA) and deadband handling to optimize performance and allow the gimbal to be controlled smoothly.
- Designed a custom gimbal frame with optimized geometry for low rotational inertia and balanced center of mass.

Servo-Actuated 2-DOF Excavator Payload Mechanism — **Buffalo, NY**
Personal Project — *January 2026*
- Designed a fully 3D-printed excavator-style payload system in Fusion 360 with two actuated joints (elbow, wrist) for controlled object manipulation.
- Created 3D-printed bearings and gears for stabilized movement at each joint; integrated high-torque servos with bearing-supported pivot points to reduce friction.

PROFESSIONAL EXPERIENCE

Infusion by Castles — **New York, NY**
Advertising Intern — Client Operations & Office Design — *August 2022 – September 2024*
- Organized direct mail campaign files by market segment (International, AA, HS) for client access, and led an office layout redesign during a company relocation to support workflow efficiency.