

Enrique Garcia Rivera

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Education

Washington University in St. Louis, McKelvey School of Engineering – St. Louis, MO *Expected: May 2027*
Bachelor of Science in Mechanical Engineering, Minors in Aerospace Engineering and Mechatronics Cumulative GPA: 3.62/4.00
Relevant Coursework: Mechanical Vibrations, Fluid Mechanics, Solid Mechanics, Thermodynamics, Materials Science, Numerical Methods and Matrix Algebra (MATLAB), Electronic and Electrical Circuits (Arduino IDE), Machine Shop Practicum

Technical Skills

- **Design & Analysis:** CAD Modeling, Simulation, FEA (SolidWorks, Ansys), MATLAB/Simulink, Python, Sensor Fusion
- **Tools & Prototyping:** 3D Printing, CNC Machining, GD&T, Soldering, Wiring, IMU/GPS Integration

Experience

WashU Vertical Takeoff and Landing (VTOL) – *Lead Avionics Engineer*, St. Louis, MO Sep 2025 – Present

- Led development of the avionics and control architecture for a semi-autonomous VTOL aircraft, integrating flight-critical electronics, sensors, and power systems.
- Integrated Pixhawk 6C, GPS, IMU, telemetry, and custom harnessing; supported hardware-in-the-loop (HIL) testing to verify flight-control behavior prior to field tests.
- Debugged firmware, communication links, and sensor-fusion issues, improving overall GN&C system reliability and stability in autonomous modes.
- Collaborated on subsystem integration, EMI mitigation, instrumentation layout, and flight-test preparation to support iterative control-system refinement.

WashU Design Build Fly (DBF) – *Aerodynamics & Payload Engineer*, St. Louis, MO Sep 2024 – Present

- Designed NACA-series wings and control surfaces using XFLR5, CFD, and analytical flight-dynamics methods to optimize lift, stability, and mission performance.
- Performed 2.5g structural and mass-distribution analyses in SolidWorks/Ansys to meet stiffness, weight, and maneuverability constraints.
- Supported fixed-wing flight testing, collecting and analyzing performance data to assess aerodynamic efficiency, stability margins, and control response.
- Created aerodynamic documentation and simulation workflows to support training and team-wide consistency.

Robotics Lab, UMKC – *Research Intern*, Kansas City, MO May 2025 – Aug 2025

- Built a multimodal embedded sensing platform using Teensy 4.0, acquiring synchronized EMG + 9-axis IMU data at 1 kHz and using Python for data acquisition, preprocessing, and state-estimation analysis.
- Implemented an Extended Kalman Filter (EKF) in MATLAB for IMU fusion, reducing drift and improving attitude-estimation accuracy.
- Performed IMU calibration, magnetometer alignment, and hard/soft-iron compensation to ensure stable behavior during dynamic tests.
- Presented results on sensor fusion, control-relevant estimation, and system reliability at the IEEE Body Sensor Networks Conference (2025).

Federal Express Corporation – *Material Handler*, Kansas City, MO Jun 2024 – Aug 2024

- Processed 100+ packages/hour with 99.8% accuracy using industrial material handling systems.
- Reduced manual errors by 15% and defects by 20% through optimized loading patterns and handling practices.
- Supported workflow organization and ensured safety compliance while routing over 5,000 daily shipments.

Projects

Adaptive Cruise Control (ACC) System – MATLAB *Spring 2025*

- Modeled longitudinal vehicle dynamics and designed a PID-based control system in MATLAB/Simulink for stable spacing under varying lead-vehicle motion.
- Simulated closed-loop behavior using Runge-Kutta integration, analyzing stability, overshoot, and controller robustness under sensor latency.

Autonomous Ambulance Navigation System – Arduino *Fall 2024*

- Developed an embedded navigation system using ultrasonic sensing, PWM motor control, and real-time obstacle detection for autonomous path following.
- Tuned control logic and validated sensing accuracy in a controlled test environment to ensure reliable tracking performance.