

# ENRIQUE GARCIA RIVERA

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## EDUCATION

### Washington University in St. Louis, McKelvey School of Engineering

Bachelor of Science in Mechanical Engineering, Minors in Aerospace Engineering and Mechatronics

Expected: May 2027

GPA: 3.62/4.00

**Relevant Coursework:** Aerodynamics, Fluid Mechanics, Heat Transfer, Thermodynamics, Solid Mechanics, Vibrations, Design of Thermal Systems, Numerical Methods (MATLAB), Materials Science, Modeling, Simulation, and Control

## SKILLS

- **Technical Competencies:** Mechanical design principles, rapid prototyping and fit checks, basic precision alignment, structural analysis and load considerations, motion and actuation fundamentals, test planning, data interpretation
- **Software and Hardware Systems:** SolidWorks, MATLAB and Simulink, Python, C++, ANSYS, microcontroller platforms (Teensy/Arduino), sensor integration (IMU/GPS), basic machine shop tools and 3D printing, bench-level testing

## EXPERIENCE

### WashU Vertical Takeoff and Landing (VTOL) – Lead Avionics Engineer, St. Louis, MO

Sep 2025 – Present

- Supported development of the avionics architecture for a semi autonomous VTOL aircraft, working across sensors, power systems, wiring, and flight controller setup.
- Configured Pixhawk 6C and PX4 firmware, tuned PID gains for stable behavior, and verified system responses through Hardware in the Loop testing.
- Diagnosed communication and sensor fusion issues by reviewing test data and logs, improving consistency through iterative testing and verification.
- Worked alongside mechanical and electrical teams on component placement, mounting decisions, and overall system integration, applying a first principles approach to troubleshooting.

### Robotics Lab, UMKC – Research Intern, Kansas City, MO

May 2025 – Aug 2025

- Developed a multimodal sensing platform on a Teensy 4.0 by integrating EMG and IMU hardware, applying mechanical and electrical fundamentals to support stable mounting and data quality.
- Built simple test fixtures and alignment setups to secure sensors during calibration and controlled experiments.
- Designed and executed calibration and signal verification procedures that checked timing, alignment, and noise characteristics, reinforcing a systematic, test driven approach.
- Analyzed fused EMG, MMG, and motion data to evaluate system behavior and used results to refine sensing and test setups based on measurable performance.

### WashU Design Build Fly (DBF) – Aerodynamics & Payload Engineer, St. Louis, MO

Sep 2024 – Present

- Used SolidWorks to model wings, control surfaces, and payload components, applying design fundamentals and first principles reasoning for geometry, loads, and manufacturability.
- Performed 2.5 g structural checks and mass distribution analyses in SolidWorks and Ansys, iterating CAD designs based on predicted stresses and deflections.
- Evaluated fixed wing flight data to compare predicted behavior with measured performance, supporting data informed design updates.
- Created documentation for analysis steps, modeling workflows, and test procedures to ensure repeatable and well communicated design processes.

### Federal Express Corporation – Material Handler, Kansas City, MO

Jun 2024 – Aug 2024

- Processed 100+ packages per hour with 99.8% accuracy while operating industrial handling equipment in a fast paced environment.
- Reduced manual errors by 15% and defects by 20% through improved handling methods and attention to detail.
- Supported workflow organization and safety compliance while routing over 5,000 daily shipments.
- Worked collaboratively with logistics teams, maintaining reliable communication and consistent execution under time constraints.

## PERSONAL AND ACADEMIC PROJECTS

- **WebTunnel CFD Simulator (JavaScript):** Built a browser-based Stable Fluids solver with semi-Lagrangian advection and Gauss-Seidel projection for real-time flow visualization.
- **Multi Sensor Flight Navigation EKF System (C++/Python):** Implemented a 12-state EKF on a Teensy to fuse IMU, GPS, and barometer data, validating drift reduction through repeatable tests.
- **Adaptive Cruise Control Dynamics Model (MATLAB):** Modeled longitudinal vehicle dynamics and tuned PID gains using Runge-Kutta integration to assess robustness under sensor latency.
- **Autonomous Ambulance Navigation System (Arduino):** Built an ultrasonic-based navigation system with PWM motor control and tested obstacle detection through iterative prototyping.