ENRIQUE GARCIA RIVERA

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EDUCATION

Washington University in St. Louis, McKelvey School of Engineering *Expected: May 2027*
Bachelor of Science in Mechanical Engineering, Minors in Aerospace Engineering and Mechatronics 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
- Led development of the avionics and control architecture for a semi autonomous VTOL aircraft, supporting system integration across sensors, power systems, and wiring.
- Configured Pixhawk 6C and PX4 firmware, tuning PID gains for stable control behavior and validating performance through Hardware in the Loop testing.
- Troubleshot communication links and sensor fusion issues by reviewing test data and flight logs, improving system reliability through iterative testing.
- Collaborated with mechanical and electrical subteams during assembly and layout decisions, reinforcing a first principles approach to integration and test preparation.

Robotics Lab, UMKC – *Research Intern*, Kansas City, MO May 2025 – Aug 2025
- Developed a multimodal sensing system on a Teensy 4.0, integrating EMG and IMU hardware for synchronized data collection and motion analysis.
- Built a vision based tracking system using ArUco markers and implemented an Extended Kalman Filter in MATLAB for improved motion estimation.
- Designed calibration and signal conditioning procedures to verify accuracy and alignment, applying a methodical, test driven workflow.
- Validated system performance through controlled experiments and analyzed fused data to evaluate system behavior and measurement precision.

WashU Design Build Fly (DBF) – *Aerodynamics & Payload Engineer*, St. Louis, MO Sep 2024 – Present
- Designed NACA based wings and control surfaces using XFLR5, CFD, and analytical methods, applying first principles to improve performance and stability.
- Performed 2.5 g structural and mass distribution analyses in SolidWorks and Ansys and iterated payload mechanisms through CAD modeling and ground testing.
- Analyzed fixed wing flight test data to compare predicted and measured behavior, supporting data driven design decisions.
- Documented modeling and testing workflows to ensure repeatable engineering processes and clear communication across the team.

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.