

Luis Garcia Rivera

Kansas City, MO | garciarivera@wustl.edu | HSF Scholar | U.S. Citizen

EDUCATION

Washington University in St. Louis, McKelvey School of Engineering St. Louis, MO
B.S. Mechanical Engineering, Minors in Robotics & Mechatronics Expected Dec 2027
GPA: 3.79/4.00 | Honors: Dean's List, HSF Scholar

ENGINEERING EXPERIENCE

Manufacturing Equipment Engineer Co-Op – Tesla Fremont, CA
Model 3 Body in White (BIW) Manufacturing Jan 2026 – Present

- Designed a Go/No-Go calibration fixture for stud welding guns to resolve a recurring 2.5mm TCP deviation, using a chamfered funnel alignment constraint and dowel-pinned L-bracket to achieve <0.25mm calibration variation and eliminate KUKA/FANUC robot path reprogramming on the BIW line.
- Optimized a multi-robot spot welding cell by re-sequencing weld points and validating interference zones, achieving a confirmed 10-second cycle time reduction (75s → 65s) locked into production program.
- Reverse-engineered and designed 8 custom fixture clamps in CATIA V5, avoiding \$88,000 in OEM costs and reducing lead time from 10 months to internal machining time.
- Leveraged Splunk and SCADA to query real-time fault data across FANUC and KUKA robots, driving root-cause analysis and reducing recurring downtime events.
- Redesigned EOAT with integrated pneumatic cylinders to dynamically realign parts during transfer, mitigating pick-up faults and reducing material drop rates.

Optimus Academy – Humanoid Robotics Training Facility Mar 2026 – Present

- Led facility transformation of legacy Model S/X line into a 40-station humanoid robotics training academy; developed Phase 1 AutoCAD floor plan from legacy DWG files and on-site measurements, coordinating with architects for permitting sign-off.
- Designed HRC cells with 36" maintenance and 48" pedestrian clearance zones, specifying 80/20 extrusion, light curtains, and SICK/Keyence scanners; mapped and preserved 480V drops, pneumatic lines, and GuardLogix PLC cabinets to eliminate safety logic reprogramming.

Undergraduate Researcher – Computational Mechanics & AI Lab St. Louis, MO
Applied Machine Learning in Fluid Dynamics May 2025 – Aug 2025

- Architected physics-informed neural networks (PINNs) in PyTorch to predict fluid flow behavior, achieving a 1000× reduction in simulation time vs. traditional CFD solvers.
- Built a modular Python pipeline to translate and modernize legacy Fortran solvers, improving reproducibility and validation speed across rapid parameter studies.

Structures Engineer – WashU Design/Build/Fly (AIAA) St. Louis, MO
Composite Airframe Design Aug 2024 – Present

- Designed load-bearing composite structures in SolidWorks; utilized ANSYS FEA to validate safety factors while optimizing for minimum takeoff weight.
- Led fabrication and destructive testing of composite prototypes, correlating experimental data with FEA models to refine structural design iterations.

TECHNICAL SKILLS

Manufacturing & Facilities: AutoCAD (floor planning, DWG), CATIA V5, SolidWorks (CSWA), ANSYS (FEA/CFD), GD&T, DFM, 3D Printing, Machining (Lathe/Mill)

Data & Analytics: Splunk, SCADA, Python (PyTorch, NumPy, Matplotlib, Pandas), MATLAB, OEE Optimization, Root Cause Analysis (RCA), DOE

Automation & Controls: Allen-Bradley GuardLogix PLC, KUKA/FANUC robot programming, PLC Logic, Sensor Integration (Prox, Laser, Light Curtains, SICK/Keyence), Pneumatics

LEADERSHIP & ACTIVITIES

Teaching Fellow: Engineering Circuits | **Tutor:** WashU Learning Center | **Member:** SHPE, ASME,
Undergraduate Advisory Board Aug 2025 – Present