

# Sarah María García Ramírez

## Administrative Mechanical Engineer

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### EXPERIENCE

#### XR/VR Researcher – Aerospace Training Systems | University of Michigan – NASA (SURE Program)

June 2025 – August 2025

- **XR/VR Development & Immersive Design:** Designed immersive extended reality experiences for air traffic controller training using Apple Vision Pro, simulating real control tower environments with spatial interactions and realistic operational scenarios
- **AI Integration & LLM Systems:** Engineered Large Language Models (LLMs) as cognitive copilots to support strategic and tactical decision-making in air traffic control (ATC), implementing prompt engineering techniques that enhanced training effectiveness
- **Prototyping & UX Design:** Developed interactive wireframes and functional prototypes in Figma, including flight trajectory visualizations, AI-generated suggestions, session timelines, and real-time performance monitoring dashboards
- **Cross-functional Collaboration:** Collaborated in international, multidisciplinary teams combining aerospace systems engineering, human factors research, and artificial intelligence to deliver innovative training solutions

#### Research Assistant – Manufacturing and Life Cycle Assessment | Monterrey, Nuevo León

August 2024 – May 2025

- **LCA Research & Technical Analysis:** Conducted comprehensive research on reliable technical references and methodologies to support engineering decision-making based on Life Cycle Assessment (LCA) in manufacturing processes, establishing frameworks for sustainable design practices
- **Industrial Problem Solving & Optimization:** Analyzed and proposed solutions to complex industrial challenges presented by FRISA, focusing on process optimization, sustainability improvements, and resource efficiency in manufacturing operations
- **Energy Optimization & Sustainability:** Implemented LCA methodologies to evaluate energy reuse strategies in manufacturing systems, developing analytical models that identified opportunities for reducing environmental impact and operational costs

### PROJECTS

#### Design of Mechanical Properties through Heat Treatment for Boron Steels | UDEM-Ternium Collaboration

August 2025 – December 2025

- **Experimental Design & Heat Treatment:** Developed comprehensive experimental procedures involving quenching, tempering, and carburizing processes to increase surface hardness above 50 HRC in boron steels, optimizing treatment parameters for industrial applications
- **Simulation & Experimental Validation:** Correlated thermal simulations with experimental results using ASTM G65 wear testing, microhardness measurements, and metallographic analysis, achieving strong agreement between predicted and actual properties
- **Process Optimization & Failure Reduction:** Proposed optimized heat treatment cycles that improved wear resistance and mechanical performance, reducing premature failures and industrial reprocessing costs through data-driven process refinement

#### Design and Construction of a Tennis Ball Launcher Machine | UDEM

August 2024 – November 2024

- **Design & Engineering:** Performed conceptual mechanical design, power calculations, and component selection for a 1 HP motor system, designing belt-pulley transmission and selecting AISI 1045 steel shafts to optimize performance and durability
- **Prototype Development:** Built functional aluminum prototype (24.5 kg) with four degrees of freedom achieving 22.8 m parabolic range, demonstrating successful mechanical systems integration
- **Testing & Validation:** Implemented safety mechanisms and conducted comprehensive experimental testing, validating performance under real operating conditions and ensuring reliability and design compliance

### EDUCATION

#### Universidad de Monterrey | Monterrey, Nuevo León

December 2025

Bachelors - Administrative Mechanical Engineering

### SKILLS

Mechanical Design  
Manufacturing Processes  
Heat Treatment  
Life Cycle Assessment  
Experimental Testing

Siemens NX (CAD)  
MATLAB  
HyperMesh  
Figma  
Digital Twins

XR / VR / MR  
Prompt Engineering & LLMs  
Additive Manufacturing  
Six Sigma & DMAIC  
Project Management