CAROL REJI

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EDUCATION

The University of Texas at Austin Bachelor of Science in Mechanical Engineering, Manufacturing & Design Track Dec 2026

Relevant Coursework: Machine Elements, Heat Transfer, Mechatronics, Materials Processing, Fluid Mechanics, Materials Engineering, Thermodynamics, Mechanics of Solids, Dynamics, MATLAB, Projects in Mechanical Engineering

PROFESSIONAL EXPERIENCE

Spacecraft Composites Manufacturing Engineering Intern - Firefly Aerospace - Austin, TX May 2025 - Aug 2025

- Spearheaded production and implementation of lunar landing structural component from post-design to final product increasing stability and reliability.
- Devised **CNC**-routed **composite manufacturing** tooling using **Siemens NX**, engineering drawings with tolerances, vacuum lines, and tooling stand with appropriate bolting patterns.
- Produced pre-cure, post-cure, routing, and assembly of work instructions and oversaw **composite manufacturing** issues on ply charts, pre-preg and curing layup procedures, vacuum bagging and debulking, detooling, and tooling fixture **tolerancing**.
- Conceptualized detooling for Blue Ghost oven-safe, crane-operable cart and adhesive gun attachments with **NX** CAD.

ACADEMIC PROJECTS

Solar Car: Vehicle Ergonomics Engineer - UT Longhorn Racing (LHR) - Austin, TX Aug 2024 - Aug 2025

- Created and optimized driver safety pedal box design within frame system for long-distance American Solar Challenge.
- Model and test components for braking system, including handbrake, accelerator, and pedal tabs utilizing **SolidWorks Topology Optimization**, **SolidWorks Simulation**, **Ansys Structural**, brake calculations, and re-bleeding brakes.
- Executed **composites** (forged carbon fiber) layup for vehicle steering, optimizing strength and robustness.

Solar Car: Electromechanical Cooling Engineer - UT Longhorn Racing (LHR) - Austin, TX Sept 2023 - Jul 2024

- Manufactured aeroshell for the first running UT solar vehicle in over a decade using Solidworks.
- Modeled and prototyped **SolidWorks** battery box package, including fan exhaust assemblies and ideal fan configurations.
- Initiated review of computation fluid dynamics (**Ansys Fluent)** simulations of cooling system to optimize heat transfer and fluid dynamics.
- Experimented with **composite manufacturing** (fiberglass and carbon fiber layups, resin mixtures) techniques for aeroshell.

Aerodynamics Engineer - UT Design, Build, Fly (DBF) - Austin, TX Sept 2023 - Aug 2024

- Perfected ideal material processing techniques and layup procedures for 17th National Place RC aircraft.
- Manufactured aircraft body (wings, tail, ailerons) utilizing **composite manufacturing** techniques (resin, fiberglass, sanding, and vacuum bagging).

RESEARCH

Undergraduate Researcher - UT Molecular Dynamics (MD) and Computational Methods - Austin, TX Jul 2024 - Aug 2024

- Modeled an MD engine examining membrane bending phenomena among bulk molecular interaction for critical cellular processes, such as cell division, signaling, and stimuli responses.
- Utilized **Jupyter Notebook** to model the interaction of protein pairs with **Python** for evaluation of cell functions.
- Conducted biomedical data visualizations of Leonard-Jones potential forces and Lipid-Lipid Protein Separation.

Microwave Plasma Generator - UT Freshman Introduction to Research in Engineering - Austin, TX Sept 2023 - Dec 2023

- Simulated dielectrics with various geometries for ammonia production with zero carbon emissions using **Ansys HFSS**.
- Researched efficient plasma generation techniques for optimization of ammonia production processes for soil renewability.

SKILLS

Technical Skills: SolidWorks (CAD and Simulation); Siemens NX; Ansys Structural, HFSS Fluent (FEA and CFD); Autodesk Inventor, Revit; Microsoft Office Applications

Programming Languages: Python, Java, MATLAB, HTML, CSS

Manufacturing: Composite Manufacturing, 3D Printing, CNC, Lathe, Laser Cutting, Soldering, Welding, OSHA, Power Tools