

Mohana “Mani” Lotfi

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EDUCATION

Concordia University - B.Eng. Mechanical Engineering

Expected 2028

PROJECTS

Aircraft Longitudinal Pitch Control System

MATLAB, Simulink, State-Space Modeling, Control Systems

- Developed a Boeing 747 longitudinal state-space model at Mach 0.80 and 40,000 ft to characterize short-period and phugoid dynamic modes
- Designed and evaluated pitch-control strategies under actuator constraints, disturbances, and robustness cases; validated MATLAB results against Simulink with a maximum discrepancy of 0.00063°

Aircraft Environmental Control System

MATLAB, Thermodynamics, Fluid Mechanics, Heat Transfer

- Developed a closed-loop aircraft avionics cooling model integrating thermal loads, duct pressure losses, fan performance, and air-to-air heat-exchanger sizing
- Sized the baseline system for 2.58 kW cooling, 0.171 kg/s airflow, and 164 Pa pressure rise, then performed sensitivity analysis to evaluate thermal and fluid-system design trade-offs

Rocket Fin Flutter & Structural Dynamics Analysis

SolidWorks, FEA, Structural Dynamics

- Analyzed rocket-fin bending and torsional vibration using analytical calculations and finite-element modeling to evaluate structural behavior relevant to flutter
- Evaluated fin-thickness sensitivity and obtained a baseline torsional-to-bending natural-frequency ratio of 2.80, comparing modal behavior across design variations

EXPERIENCE

Space Concordia - Solid Rocketry

Feb 2026 - Present

Manufacturing Team Member - Montreal, QC

- Manufacture and assemble solid-rocketry components from engineering drawings and design requirements as part of a multidisciplinary engineering team
- Support component preparation, fabrication, subsystem integration, and testing while resolving manufacturing issues with design and production members

Mohkam Saze Co.

Jun 2021 - Dec 2024

Manufacturing Assistant - Iran

- Supported construction-component manufacturing through equipment setup, machine maintenance, troubleshooting, and quality inspection
- Evaluated manufacturing equipment against technical specifications, production capacity, cost, and process requirements to support equipment-selection and process-improvement decisions
- Coordinated with production personnel and customers to resolve manufacturing and product-requirement issues and support order fulfillment

SKILLS

Design & Simulation: SolidWorks, FEA, MATLAB, Simulink

Analysis: Control Systems, State-Space Modeling, PID Control, Modal Analysis, Sensitivity Analysis

Programming: C++, MATLAB, Arduino

Thermal & Fluids: Thermodynamics, Fluid Mechanics, Heat Transfer, Heat Exchanger Analysis

Certifications: MathWorks Foundational Simulink; MATLAB, Simulink, Simscape & Multibody Simulation Onramp