Rohen Andrew Agarwal

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SUMMARY

Highly motivated, creative, and team oriented professional Aerospace Engineer with multiple years experience in Propulsion, Structural Design and Analysis, CAD modeling, and programming skills in a major company like Rivian. Offering leadership, innovation, experience, and product development skills to solve challenges and to further aerospace programs

EDUCATION

University of Illinois at Urbana-Champaign **Graduation: May 2022**

- **Bachelor of Science**, Aerospace Engineering
- **Awards/Honors**: Dean's list (x2), AE Scholarship (AY 2021)
- **Fields of Interest**: Aerospace Structures, Avionics (Flight software/Controls), Propulsion, Orbital Mechanics, Electric Vehicles

EXPERIENCE

Rivian Automotive – Sr. Manufacturing Process Engineer - Propulsion **May 2022 - current**

- Designed Enduro electric propulsion engine involving high power electronics and concepts of electric motors and drives
- Performed FEA for static, dynamic, and thermodynamic loads using ANSYS, and used COMSOL during electromagnetic simulations
- Reduced scrap cost by 300,000 dollars a year by using GD&T training to design, model, and fabricate composite, ABS, and metallic fixtures thus reducing damage of power modules in the Drive Units
- Leveraged Matlab/Simulink while scripting code to autotune induction motor speed control-loop gains to find breakpoint at normal and abnormal operating conditions of the stator
- Formulated, and led test plans for initial design validation builds of the electric motor in a high voltage high speed dyne that gave insightful feedback for design iterations potentially saving $500,000.
- Incorporated statistical learning methods and regression modeling techniques on motor torque results to iterate designs

Bangalore Aircraft Industries Limited - Mechanical Engineer **May 2020 - Jan 2021**

- Led wind tunnel testing using LabView on Indian military HAL Tejas aircraft to find stall angle of attack and pressure distribution around the fuselage
- Modeled 3 CAD drawings for a lightweight military aircraft using Siemens NX and CREO
- Performed thermal simulations on Turbojet and Turbofan engines using ANSYS Fluent to analyze
- Incorporated program management skills while balancing weight, cost, material, and design for manufacturability at design review meetings
- Contributed in using schematics and drawings to detect and troubleshoot electronic failures during high voltage testing
- Investigated and succeeded in rectifying structural failures/inadequacies in an Indian Air Force plane using NASTRAN by running structural analysis simulations saving $17000

PROJECTS

- **Propulsion/ Avionics/ Structures/ Guidance and Navigation Engineer (THRUST)** **Aug 2021 - May 2022**
  - Optimized engine performance by analyzing thrust curves for various cone angles, and diameter of propellant and casing
  - Led and coordinated testing, manufacturing, and integration of grid fins for our reusable rocket
  - Conducted research to design a new liquid propellant engine propulsion system
  - Engineered CFD models to understand airflow through cooling packages
  - Guided virtual design and validation of the thermal system in rocket engine
  - Evaluated inefficiencies in sounding rockets' plumbing systems and developed a new CO2-dependent pneumatics system with nearly 23% lesser weight.
  - Authored a PDR, to persuade the funding board and went on to secure $15000 funding for the project
- **ACS/Propulsion Lead - Systems Design of a Disaster Detection Satellite** **Nov 2021 - May 2022**

  Technical lead for ADCS and Propulsion, as well as team lead of 8 members overlooking management and development processes of a natural disaster detection satellites based on Task Order in Request for Proposal from client
- **Controls Engineer - System Identification of an Unmanned Aerial Vehicle** **Aug 2021 - Dec 2021**
  - Programmed a UAV using Python and C and optimized state space model using Linear Quadratic Regulator (LQR) to get error in x, y, z, roll, pitch, and yaw states below tolerance.
  - Conducted research to perform system identification on any given UAV.
  - Co-authored and published a research paper called "*White-Box Identification of Transfer Function for Dynamics of A Small-Scale Quadcopte*r"
- **Team lead for research project in Aerospace Numerical Methods** **Jan 2021 - May 2021**
  - Organized and led a research group in solving the N-Body problem using Finite Difference Methods, and the Wave Equation using Finite Element Methods
  - Tailored real time planetary data from NASA and programmed MATLAB and Python code to run realistic simulations using finite difference/element methods,
  - Co-Authored research papers "*Solving the N-Body Problem using Finite Difference Methods*" and "*Solving the Wave Equation (IBVP) using Finite Element Method*"

- **Guidance Navigation and Control - Aerospace Control Systems Design Projects** **Jan 2021 - May 2021**
    - Coded controllers and observers in simulation for control moment gyroscopes, differential drive robots, satellite with star trackers, and a trajectory tracking drone

TECHNICAL SKILLS:

- Simulink, Siemens NX, AutoCAD, SolidWorks, PCB design(KiCAD), ANSYS Fluent, Control Theory, NASTRAN/PATRAN, CFD, LabVIEW, CREO, Microsoft Office, CatiaV60, LTSpice, FreeFlyer, OpenVSP, XFOIL, GIT
- Python, MATLAB, HTML, CSS, JS, SQL, Ignition, Jira, FactoryTalk, Studio5000, RSLogix, PLC, Ladder Logic, C/C++, Beckhoff, Arduino
- Boundary Layer Modelling, Orbital Mechanics, Stability and Control of Aircraft, Trade Studies, Aerospace Numerical Methods, Rocket propulsion methods, Electric Propulsion, Introduction to Human Spaceflight, Nanosatellite design and build, Functional and Physical Decomposition, Systems Engineering V, Concept of Operations, Aerospace Systems Design, Computational Fluid Dynamics, BOM generation, Oscilloscopes, Wind tunnels, Piezoelectric materials, Waveform Generator, Inverted Pendulum, 2-Channel Fourier Analyzer, Euler angles transformation