SHASHWAT PATNAIK

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EDUCATION

Master of Science in Aerospace Engineering, University of Michigan - Ann Arbor — Expected 2024
Cum. GPA: 4.00
Relevant Coursework: Computational Fluid Dynamics I and II, Turbulent Flows, Flight and Trajectory Optimization, Multidisciplinary Design Optimization.

Bachelor of Technology in Mechanical Engineering, Delhi Technological University — 2018 - 2022
Relevant Coursework: Fluid Mechanics and System, Thermal Engineering, and Gas Dynamic and Jet Propulsion.

EXPERIENCE

Team Supervisor — August 2019 - July 2022
DTU ALTAIR — *Delhi, IN*

- **Achieved** an increase in the lift by 20% by optimizing the planform shape of small-scale satellite's payload's wing to achieve a decent rate of 15m/s using **MATLAB** and **XFOIL** for CANSAT 2021.
- **Implemented** algorithms to deploy payload and to build their **control system**.
- **Coordinated** 5-6 members in various competitions to create robots for micro autonomous robots and drones.

Mechanical Engineering Intern — May 2019 - July 2019
MARUTI SUZUKI INDIA LIMITED — *Delhi, IN*

- Investigated **failure analysis for various automotive components** and identified prevention methods.
- Analyzed the fracture features and developed a database of the topography of the fracture surface to the causes.

Aerodynamics Lead-Engineer — August 2018 – December 2018
DTU SUPER MILEAGE VEHICLE — *Delhi, IN*

- **Developed** vehicle outer chassis through **vacuum bagging** (CFRP), decreasing gross weight by 27%.
- Designed and simulated the chassis and the vehicle's outer shell utilizing **Solidwork** and **ANSYS**.

PRUBLICATION

Design Optimization of Monoblade Autorotating Pods To Exhibit an Unconventional — January 2022

- An **element-based computational method** was employed to estimate the geometry by maximizing the coefficient of power by 52% through **MATLAB**.
- Computed **6-DOF dynamic model** of the pod through **SIMULINK** to reducing drift in all axis by 12%.

Implementation of Bio-Inspired Riblets in Supersonic Nozzles — July 2022

- Established a **RANS** framework in **OpenFOAM** to exhibit the viability of riblets on nozzles to delay separation.
- Computed fluctuations in **kinetic energy and wall shear stress** of the flow, demonstrating riblets create higher momentum at near-wall flow, **delaying the separation by 11%.**

ACADEMIC PROJECT

First and second-order finite volume solver to simulate flow over the multi-element airfoil — April 2023

- Programmed **adjoint-based mesh adaptation** for mesh refinement and developed functions for **Roe flux** and **LCD for limiter**.
- Developed first and second-order **Finite Element Method, Finite Volume Method, and Finite Difference Method solver** to simulate compressible flow over the multi-element airfoil using **SSP-RK2 with local time stepping**.

PDF modeling using Generalized Langevin Model for turbulent channel flow — Ongoing

- Implemented a **PDF stochastic Lagrangian model** using the Generalized Langevin Model and quadratic 2-Stage least square regression method to model turbulent channel flow.

SKILLS

CAD	Solidworks **(CSWP)**, Catia V5, Fusion 360, Auto-desk Inventor
Simulation and Analysis Software	ANSYS, Simulink, OpenFOAM, STAR-CCM+, Deform 3D
Language	Python, MATLAB, C++, SQL