Ritik Gupta

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Summary
PORTFOLIO: ritikg99.github.io

A Mechanical engineer with a focus on computational tools and two years of experience as a Design and CFD Engineer at a defense aerospace startup. This, along with multiple projects and internships like Formula SAE in Mechanical Design, 3D Modeling and CAE, have refined my problem-solving skills and engineering analysis skills.

Education

University of Washington — **Seattle**
M.S., Mechanical Engineering, 3.76 GPA — *2024-2026*

Dayananda Sagar College of Engineering — **Bangalore**
B.E., Mechanical Engineering, 3.68 GPA — *2018-2022*

Professional Experience

TSALLA AEROSPACE — **Bangalore**
Design and CFD Engineer (Full-time) — *October 2022-July 2024*

Development and improvement of design of a fixed-wing VTOL and a autonomous quadcopter UAV at a defense startup. (Skills/Tools: Ansys Fluent, Structural, Catia V5, Solidworks, MATLAB, surfacing, part design)

- Involved in complete design of quad-copter UAV, from conceptual stage to prototype, developed several mechanisms (like battery locking) and applied GD&T, ensured weight constraints and FOS criteria were met through FEA Analysis.
- Designed fuselage for compact integration of electronics/robotics & actuators through advanced surfacing, part design. Tested prototypes through rapid prototyping (3D Printing), sensor integration (LiDAR, TOF) for an autonomous UAV.
- Spearheaded wind tunnel testing of a UAV (CAD, DFM, FEA); Reduced set-up times for CFD simulations by 15-20%.

Design and CFD Intern — *March 2022–October 2022*

- Increased L/D ratio of a UAV by 9.3% through geometric changes, tested via CFD analysis; reduced 4% weight in design.

CAMP-PhyRE Lab - University of Washington — **Seattle**
Research Assistant - Department of Mechanical Engineering — *Jan. 2025 – Present*

- Implemented various Quasi-Newton and Stochastic Optimization algorithms on Acoustic simulations for an Acoustic Fish Deterrence System; reduced cost function by 38%. Hands on experience running the algorithms on HPC.

INDIAN INSTITUTE OF SCIENCE(IISc) — **Bangalore**
Research intern — *Aug. 2021 – Feb. 2022*

Tested different process parameters of a Ceramic Plate Catalyst, aimed to reduce the erosion rate of the catalyst.

Projects/Extracurricular Activities

Team Captain and Suspension Lead at DSCE-Motorsports (Formula SAE) — **Dec. 2018-Feb. 2022**

- Designed the rear suspension geometry from scratch with vehicle roll, contact path and structural constraints. Determined design parameters of A-arms and selected hard points on chassis after suspension modeling.
- Developed a MATLAB code to calculate the load transfer of the FS car in various conditions like turning and braking.
- Reduced weight of suspension sub-system by 6%, handled design, packaging and clearance of various components and assemblies (SolidWorks and CATIA V5).
- Performed Finite Element Analysis of components like engine mount, sprocket, and selected materials in powertrain, worked with different manufacturing methods.

Design of a Wind Turbine Blade through Development of BEMT Code — **Mar. 2021-Aug. 2021**

- Developed a code for Blade Element Momentum Theory (BEMT) to obtain design parameters of a wind turbine blade and designed the blade on SolidWorks using Surfacing and Part Design.

Optimization of High Lift device of a wing using Genetic Algorithm — **Dec. 2021-Jun. 2022**

- Implemented parametrization of a Multi-element wing in Solidworkds and performed CFD simulation of wing. Improved Lift to Drag ratio by 8.2% through optimization using NSGA-II Algorithm. (Tools: Ansys Fluent, ModeFrontier)

Numerical Investigation of Double Row Vortex Generators — **Oct. 2020- Nov. 2021**

- Implemented two rows of vortex generators on a wing and performed CFD to check improvement in lift characteristics. Improved the lift-to-drag ratio of the wing by 6% and delayed the stall angle by 3 degrees. doi.org/10.1063/5.0114097

Technical and Soft Skills

CFD/CAE & CAD: CatiaV5, SolidWorks, Ansys Fluent, OpenFOAM, Star CCM+
Programming/Coding & OS: MATLAB, C/C++, Python, Linux OS, Microsoft Office software, Git, HPC, SLURM
Soft Skills: Communication skills, Problem-solving, Project Management