Raj Gopala Krishna S.V

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Professional Summary

Mechanical Engineer with a solid background in fluid dynamics, turbulence modeling, and AI-driven optimization. Experienced in solving real-world engineering problems using physics-based simulations and data-driven methods. Proficient in CFD tools such as STAR-CCM+ and ANSYS Fluent, with strong Python skills applied to predictive modeling, control optimization, and the design of thermal and aerodynamic systems.

Experience

AFRY Jan 2025 – July 2025
Master Thesis: Dynamic Control of HVAC Attributes Using 3D-CFD and Machine Learning

- Developed a surrogate model using high-fidelity CFD simulations to predict indoor thermal and flow behavior.
- Integrated CFD-based flow predictions with a reinforcement learning controller to dynamically adjust inlet temperature, radiator output, and mass flow rate.
- Reduced HVAC energy consumption while maintaining target comfort levels through closed-loop optimization.
- Automated simulation workflows and data processing in Python, improving model training and validation efficiency.
- Collaborated with system engineers to validate control performance under varying boundary conditions.

Technical skills: ANSA, STAR-CCM+, Java, Python, Spectral Neural Operators, Reinforcement Learning.
Soft skills: collaboration, problem-solving, and adaptability.

Chalmers Aero Team Aug 2024 – May 2025
Design and Aerodynamics Member

- Designed and sized control surfaces to support 3g maneuvers.
- Engineered control mechanisms for aileron, flap, and rudder/elevator.
- Conducted CFD simulations on winglets and fuselage to enhance aerodynamic performance.

Technical skills: Python, OpenVSP, Fusion - 360, STAR-CCM+, 3D - Printing.
Soft skills: teamwork, adaptability, and cross-functional communication.

Turbo Energy Pvt Ltd Aug 2021 – June 2023
Lead Product Engineer

- Led development of actuators and e-recirculation valves, ensuring DFM and DFA compliance.
- Applied APQP standards from concept to PPAP.
- Reduced product costs by implementing Value Engineering-based redesigns.

Technical Skills: GD&T, DFMA, SolidWorks, Value - Engineering
Soft skills: APQP, project management, Product-Development, PPAP.

Projects

Water Spray Simulations Behind Trucks Jan 2024 – Present
Performed RANS and DES simulations to model water splash and spray under wet driving conditions. Contributed to visibility enhancement for autonomous driving in SEVVOS project at Chalmers.

Conceptual Design of Hydrogen-Powered Blended-Wing Business Jet Sep 2024 – Oct 2024
Conducted conceptual design of a six-passenger BWB aircraft powered by liquid hydrogen. Achieved $L/D \simeq 17$, optimized wing loading (74 kg/m^2), and validated 1,200 NM mission. Integrated hydrogen-adapted HF120 turbofans and demonstrated 27% lower fuel burn than conventional business jet.

AI-Based Control System for Foiling Craft Apr 2024 – Jun 2024
Implemented a PD controller in Star-CCM+ to regulate hydrofoil pitch under unsteady conditions using URANS with k-ω model.

Analysis of a Low-Noise Boxprop Propeller Jan 2024 – May 2024
Designed a Boxprop using OptoProp and MATLAB; performed CFD simulations in Star-CCM+ to evaluate aerodynamic performance and noise compared to conventional propeller. Designed Boxprop to be quieter but 6% less efficient.

CFD Simulation of Fruit Fly Wing Beat Motion Nov 2023 – Jan 2024
Simulated flapping motion of fruit fly wings using AMR mesh. Assessed unsteady lift, drag, and pitch moment contributions using STAR-CCM+.

Education

Chalmers University of Technology Aug 2023 – Sep 2025 (Expected)
M.Sc. Applied Mechanics | Specialization in CFD and Turbulence Modeling

Mepco Schlenk Engineering College Aug 2017 – Mar 2021
B.E. Mechanical Engineering

Skills

- **Simulation:** Star-CCM+, ANSYS - Fluent
- **Design:** SolidWorks, ANSA, OpenVSP, Fusion-360, CATIA
- **Programming:** Python, MATLAB, Java
- **Technical Skills:** CFD, Turbulence Modeling, Data Analytics, Spectral Neural Operators, Reinforcement Learning, GD&T.

Certificates

- Supervised Machine Learning: Regression and Classification – DeepLearning.AI (Sep 2024)
- Advanced Learning Algorithms – DeepLearning.AI (Oct 2024)
- Computational Physics with Python – Udemy (Sep 2023)

Languages

- Tamil – Native proficiency
- English – Professional proficiency
- German – Beginner