

Pranjal Anand

Graduate Research Assistant at Vlachos Research Group, Purdue University

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Research Statement

Aiming to further understanding of fluid mechanics phenomena with experiments and improve measurement methods for imaging complex systems - specifically the human body.

Education

Purdue University

PhD in Mechanical Engineering (GPA: 3.90 / 4.00)

Since 2022

West Lafayette, IN

BITS Pilani, K. K. Birla Goa Campus

B.E in Mechanical Engineering (GPA: 9.40/10.0)

August 2022

India

Publications

- Anand, P., Zhang, J., Rajendran, L.K. et al. "Quantifying numerical uncertainty in background-oriented schlieren". Exp Fluids 65, 1 (2024)
- Anand, P., Ranjan, R. "Aerothermal Predictions of High-Pressure Turbine Flows Using RANS Methods.," Aerospace and Associated Technology(Taylor and Francis, September 2022)
- Kumar, S. S. , Anand, P. "Analysis of Capillary Dynamics for Non Newtonian Fluids," Fluid Mechanics and Fluid Power, Vol.1 .(Springer, March 2023)

Coursework

Intermediate Fluid Mechanics, Numerical Methods in Mechanical Engineering, Fourier Methods in Digital Signal Processing, Design of Experiments

Research Projects

Senior Thesis: Drag Reduction on Amphibious Aircraft Using Flow Control on Backward Step

Aug - Dec 2021

- Advisor : Dr. Dhwanil Shukla, IIT Bombay
- Conducted a computational study to gauge effect of steady blowing and suction on pressure distribution behind step.
- Compared the above study with passive flow control method (inclined plate at step edge) to delay formation of coherent turbulent structures.
- The project served as a primer for experimental investigation of the same at the Experimental Aerodynamics Lab at IIT Bombay.

Compact Insulated Container for Drone Delivery

Jan - May 2022

- Course Project – Advisor: Dr. Siddhartha Tripathi, BITS Pilani
- Built a compact container which could be carried by a 330 mm drone (fiberglass frame) with easily available materials depron and coroplast.
- With a cooling pack the inner temperature could be maintained at 8 degrees celsius (required for temporary storage of most medicines)for 30 minutes.

Water Flow Analysis in a Cooling Module Manifold for Electronic Packaging

June - July 2020

- Summer Internship – Dhio Research Bengaluru
- Compared different area ratios using computational fluid dynamics software to determine optimum geometry based on flow velocity distribution.

Awards

Merit Scholarship

For Academic Excellence

2020 - 2022

BITS Pilani

Research Scholarship

For research and subsequent publications as an undergraduate)

2021

BITS Pilani

Leadership Roles

President | *Aerodynamics Club of BITS Goa*

- Led a team in designing a UAV for medicine delivery as part of an online design competition, securing 6th position out of 25 participating teams from all over India.
- Handled inventory acquisition for the project-Drone Mapping of Mangrove Swamps under club advisor Prof. Shibu Clement, funded by Goa Forest Department.
- Organized guest lectures and workshops for students in a multitude of topics in the aerospace industry.
- Mentored 100+ students in Computer Aided Design software, Fundamentals of Aerodynamics, and multirotor assembly and piloting.

Technical Skills

Languages: Python, MATLAB, C++

Computer - Aided Design: Solidworks, Fusion360, AutoCAD Siemens NX, PTC Creo