HRISHAV DEY

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EDUCATION

Purdue University — **West Lafayette, IN, USA**
Ph.D., Mechanical Engineering — Aug 2025 – Present

National Institute of Technology Silchar — **Silchar, Assam, India**
B.Tech., Mechanical Engineering — Jul 2018 – Jun 2022
CPI: **9.34**

RESEARCH INTERESTS

Transport Phenomena, Thermal Management Systems, Dynamical Systems

PROFESSIONAL EXPERIENCE

Aeronautical Development Establishment (ADE-DRDO), Bangalore, India — **Sep 2023 – Jun 2025**
(On Deputation from BEL)
Division: Structures-Testing

- Conduct Experimental Stress Analysis for Wings, Fuselages, Landing Gears and various other aircraft structures and components.
- Preparation of SFDs and BMDs for different load cases acting on the aircraft during flight or ground maneuvers.
- Conduct Experimental Modal Analysis on different aircraft structures as well as Ground Vibration Tests for ready-to-fly aircrafts.
- Perform Flight Data Analysis for Structural Health Monitoring (SHM) of aircrafts in flight.
- Establish various test setups with different instrumentation techniques, including strain gauges, hydraulic actuators for loading, accelerometers, LVDTs, draw wire sensors, and more.

Bharat Electronics Limited (BEL), Bangalore, India — **Oct 2022 - Jun 2025**
SBU: Unmanned Systems
Department: Development & Engineering
Deputy Engineer (E-II)

- Accomplish activities in the design phase of UAVs starting from conceptual design to detailed design.
- Aerodynamic design and development of Fixed-Wing Unmanned Aerial Vehicles using analytical methods, low-fidelity tools as well as using CFD.
- Perform initial analytical structural sizing and conduct feasibility checks using Structural Analysis tools to ensure the structural integrity of airframes during the detailed design phase.
- Preparation of engineering drawings for purchase orders.

RESEARCH EXPERIENCE

Concurrent Project: *Correlated Experimental and Computational Investigation of Shimmy in UAV Landing Gears* — **Dec 2023 – Apr 2025**
Advisor: M Saravana Kumar Reddy (Aeronautical Development Establishment)

- Assessed the vibration characteristics through operational data collected from flight for a 1-ton class UAV Nose Landing Gear.
- Proved the existence of shimmy during take-off and touch-down phases for certain configurations and explored the emergence of shimmy due to factors like All-Up Weight, forward velocity, free-play, on-ground structural frequencies, tire pressure, etc.
- Developed a mathematical model to evaluate the dynamic stability of similar landing gear configurations.

Undergraduate Thesis: *Numerical Investigation of Hydrothermal and Entropy Generation Characteristics for Visco-plastic Flow in Wavy Channels* **Oct 2021 – May 2022**

Advisor: Dr. Sukumar Pati (National Institute of Technology Silchar, India)

- Explored the scope of passive heat transfer enhancement for flow of shear-thinning visco-plastic fluids using wave-corrugated channels. Parameters studied were Enhancement Ratio, Performance Factor and Average Entropy Generation Ratio.
- Successfully revealed the influence of power-law index, Reynolds number, wave amplitude and wave number on the enhancement of heat transfer.

UGRC Grant Project: *Effect of finned networks on PCM based battery thermal management system for cylindrical Li-ion batteries* **Feb 2021 – Dec 2021**

Advisor: Dr. Sukumar Pati (National Institute of Technology Silchar, India)

- Recipient of a grant of 25000 INR from the Undergraduate Research Council (UGRC) of NIT Silchar to undertake a project entitled "Thermal Management of Li-ion Batteries".
- Explored the effect of novel hexagonal thermal conduction networks using metal fins for a six-series arrangement of 18650 cells using coupled NTGK and enthalpy porosity models.
- Investigated the effect of high (stressed and abuse) discharge rates and ambient temperature of the system along with the effect of external short circuit on the thermal behavior of the system.

Research Internship: *Investigation of a PCM Enhanced Li-ion Battery Pack using a Multi-Scale Multi-Dimensional Approach* **May 2021 – Sep 2021**

Advisor: Dr. Santosh Kr. Sahu (Indian Institute of Technology Indore, India)

- Performed an empirical Thermal-Electrochemical Modelling of Li-ion Batteries using the NTGK model coupled with the enthalpy porosity model to demonstrate the efficacy of Phase Change Material based thermal management strategies.
- Presented and co-authored one paper at the prestigious international conference of IHMTC-2021 held at IIT Madras

Miscellaneous: *A Mathematical Solver for Single-Particle Model using Finite Volumes*

Advisor: Dr. Sukumar Pati (National Institute of Technology Silchar, India)

- Developed a mathematical solver on MATLAB for the Single-Particle Model (SPM), using the finite volume method, describing an electrochemical-thermal behavior of a Li-ion cell.

COMPUTER SKILLS

MATLAB, COMSOL Multiphysics, ANSYS Fluent, MS Office, XFLR5, SolidWorks, AutoCAD, X-Plane, Simcenter-Testlab, Prosig, B&K Pulse.

PUBLICATIONS

Journal Papers

- **H. Dey,** S. Pati, PR Randive, L.Baranyi, "*Effect of finned networks on PCM based battery thermal management system for cylindrical Li-ion batteries*", Case Studies in Thermal Engineering, 59, 104572 (2024)
- A. Nath, **H. Dey**, S. Pati, "*Probing the hydrothermal performance of corrugated channels: A numerical scrutiny*", International Communications in Heat and Mass Transfer, 159, 108303 (2024)
- **H. Dey**, S.K. Mehta, F.A. Ahmed, P. Roy, S. Pati, L.Baranyi, "*Numerical investigation of thermo-hydraulic features of viscoplastic flow in wavy channels*", International Communications in Heat and Mass Transfer, 143, 106715 (2023)

Conference Papers (Peer-Reviewed)

- V. Saxena, **H. Dey**, A. Kumar, A. Sharma, S.K. Sahu, S.L. Kundalwal, "*Numerical Investigation of a Phase Change Material Enhanced Li-ion Battery Pack using the Dual Potential Multi-Scale Multi-Dimensional (MSMD) Approach*", Proceedings of the 26th National and 4th International ISHMT-ASTFE Heat and Mass Transfer Conference, Dec 17- 20, 2021, IIT Madras