Curriculum Vitae   Dhakal Amrit

Name	:	DHAKAL AMRIT
Gender	:	Male
Date Of Birth	:	January 2000
Education	:	M.S. Aerospace Science and Technologies
Nationality	:	Nepalese

Portfolio | Amrit Dhakal

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Languages : Chinese(Good), English(Fluent) , Nepalese(Native)
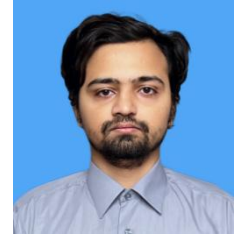
Education

Master of Science in Aerospace Science and Technologies, Expected 2026

Northwestern Polytechnical University, Xi'an, China

Awards: CSC scholarship

- Research Focus: Battery Modelling, Machine Learning, BMS and More Electric Aircraft
- Relevant Major Coursework: Optimization Theory and Its Applications, Mathematical statistics, Stochastic Processes, Mechantronic Systems, Machine Learning, Advanced Energy Materials, Guidance Navigation and Control system, Battery Modelling, Equivalent Circuit Model, Kalman and Bayesian Filters

Bachelor of Science in Aerospace Engineering, 2023

Northwestern Polytechnical University, Xi'an, China

Awards: Outstanding Graduate, Sanqin scholarship (13000 Yuan), NPU presidential first prize scholarship, International model class presentation in Chinese

- Research Focus: Computational Fluid Dynamics(CFD), Aircraft design and engineering
- Relevant Major Coursework: Advanced Mathematics, Linear Algebra, College Physics, Probability and Statistics, Aerodynamics, Structural Engineering, Electrical Engineering, Programming in C, Numerical Simulations using Matlab, Reliability Engineering, Aircraft Engine Design, Finite Element Method, Fluid Dynamic Experiments, Wind Tunnel Experiments, Electronic Experiments

Research Experiences

- **2024.12： Deep Learning based states estimation of Li-ion battery   Graduate thesis proposal**
  Conducted relevant literature review of concurrent research paper on data driven based battery modelling approaches and presented new DNN based SOC and SOH estimation method and it's verification through self conducted experimental data. Using tools such as matlab and simulink, python(Sklearn, PyTorch, matplotlib, numpy, pandas)
- **2024.10：2024.12   Battery Modelling Using Machine Learning   Research Project**
  Used NASA and Oxford datasets for training various machine learning algorithms such as k-Nearest Neighbor, Linear Regression, Weighted Total least Squares method and LSTM-based DNN to predict SOH and SOC of Li-ion batteries. Used python(Sklearn, TenserFlow, matplotlib, numpy, pandas)
- **2024.10 - 2024.12   Battery Modelling Using EIS , HPPC, OCV and stress tests   Lab Project**
  Applied AC signals to measure impedance, analyze nyquist plots and use Randles method to extract resistance and capacitance for pouch, cylindrical, and semi-solid batteries under various temperature conditions. Predicted SOC, SOH, and other parameters to understand inner electrochemical properties of the cell.Collected battery cycling data in a laboratory environment for state-of-health (SOH)

estimation and health degradation monitoring due to calender ageing of various lithium ion cells.Employed Open Circuit Voltage (OCV) and Hybrid Pulse Power Characterization (HPPC) techniques to model battery behavior and estimate state-of-charge (SOC) under various temperature and driving profiles.Conducted penetration length tests on pouch cells at various temperatures to observe battery failure characteristics under high/low temperature and pressure. Skills: lab work, matlab and simulink, report making, experimentation

- **2022-12-2023.06：**   **Numerical simulation of Supersonic Jet**   **Undergraduate Thesis**
  Conducted CFD for sonic boom prediction of JAXA wing-body and delta wing-body configurations. Analyzed shockwave patterns and noise for advanced aerodynamic design on ground using solidworks, Star ccm+, bBoom and Tecplot software package

- **2022.05-2022.08：**   **Remote control small aircraft Design**   **Course Project**
  Focused on small lightweight air frames using laser cutting and 3D printing, optimized aerodynamics, efficient power systems, and control surfaces for stability, maneuverability, and efficient flight performance, Supported by test flights. Used solidwords, RC-phoenix

- **2022.03-2022.07：**   **Conceptual Design of Business Jet**   **Course project**
  Focused on optimizing jet performance through flight dynamics calculation using mathematica, aerodynamic design using STAR-CCM+, efficient propulsion, and passenger comfort. Integrated sustainable technologies to reduce environmental impact. CAD design using Solidworks

- **2021.09-2022.01：**   **Potable Radio design**   **Electronics Course project**
  Responsible for designing a radio PCB, incorporating RF circuit design, antenna interface, signal processing, power supply, optimized trace routing, and tests to ensure efficient signal transmission and minimal interference. Skills: PCB design software, C++, soldering and wiring electronics

- **2021.07：**   **Small Sounding Rocket Design**   **Summer Camp group project**
  Responsible for CAD design manufacturing and presentation of a small sounding rocket with lightweight air-frame for strength, using solid thrusters, provided payload space for sensors, ensured stability with fins/canards, and included recovery systems such as parachute.skills solidworks, teamwork, group project

Technical Skills

- **Programming & Tools:** MATLAB and Simulink, Python(PyTorch, NLTK, Fastai, Sklearn/Scikit learn), git, C, COMSOL, Ms-Office, Star ccm+, CAD, Solidworks, Catia, Fusion 360, KiCAD PCB, Altium Circuitmaker, Proteus, LTspice

- **Modeling & Simulation:** Electrochemical models(P2D, SPM), Equivalent Circuit Models and data driven Methods, CFD simulations, FEM simulations, Kalman and Bayesian Filters (SPKF, EKF), Powertrain simulation

- **Testing & Diagnostics:** Aerodynamic experiments in wind tunnel, Hydrodynamic experiments, Electrochemical Impedance Spectroscopy (EIS), battery cycling tests, thermal chamber testing, and battery characteristic analysis, HIL and SIL testing using, battery stress/penetration test,

Hobbies

Artificial Intelligence, LeetCode, Volleyball, Football, Coffee , Traveling and exploring, etc.