

Ranadip Saha

Personal Profile

A Second-Year Ph.D. student of Mechanical Engineering at Purdue University with research focused on thermo-electrochemical interactions and metrology in lithium-ion and lithium-metal battery chemistries.

Education

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| Purdue University Ph.D. in Mechanical Engineering GPA - 3.94/4 | <i>West Lafayette, USA</i> AUGUST 2023 |
| Jadavpur University B.E in Chemical Engineering CGPA - 8.93/10 | <i>Kolkata, India</i> JULY 2019 - JUNE 2023 |
| Patha Bhavan 12th Grade (WBCHSE) Percentage - 92.4 | <i>Kolkata, India</i> MARCH 2019 |
| Patha Bhavan 10th Grade (WBBSE) Percentage - 92 | <i>Kolkata, India</i> MARCH 2017 |

Experience

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| Purdue University Ph.D. Student Supervisor Dr. Partha P. Mukherjee, Mechanical Engineering <ul style="list-style-type: none">Experimental investigation of the Thermal and Electrochemical Stability of Lithium Metal Batteries with Liquid Electrolytes.Core team member of Center for Advances in Resilient Energy Storage (CARES), established as a collaboration between Purdue University and Electrochemical Safety Research Institute (ESRI) | <i>West Lafayette, USA</i> August 2023 |
| Jadavpur University Undergraduate Researcher Supervisor Dr. Achintya Mukhopadhyay, Prof., Mechanical Engineering <ul style="list-style-type: none">Designing a 0-D model to study the pre-cooling of air using a water mist spray for the thermal management system of a battery.Modelling of evaporation, heat transfer, and electrochemical reactions taking place inside a battery based on a 0-D model using MATLAB - SIMULINK.Testing of two basic methods of triggering mist precooling based upon temperature of the battery and SEI degradation. | <i>Kolkata, India</i> Feb 2021 - Jan 2023 |
| École Polytechnique de Montréal Mitacs Globalink Research Intern Supervisor Dr. David Vidal, Asst. Prof., Mechanical Engineering <ul style="list-style-type: none">Working on Exploration of deep learning algorithms for computational fluid dynamics.Developed MATLAB code to generate geometries with periodic boundary conditions resembling porous mediaWorked with a pre-existing Lattice Boltzmann method code to simulate flow in a pseudo-porous media | <i>Montréal, Canada</i> May 2022 - August 2022 |
| Jadavpur University Undergraduate Researcher Supervisor Dr. Sudeshna Saha, Asst. Prof., Chemical Engineering <ul style="list-style-type: none">Working on Thermodynamic considerations of Temperature swing CO2 adsorption.Assisting a Graduate student in conducting laboratory experimentsDeveloping a membrane to absorb CO2 after surface modification using Bacterial Nanocellulose (BNC) | <i>Kolkata, India</i> Mar 2022 - May 2023 |

Publications

JOURNALS

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| A CRITICAL REVIEW ON GRAPHENE AND GRAPHENE-BASED DERIVATIVES FROM NATURAL SOURCES EMPHASIZING ON CO2 ADSORPTION POTENTIAL Environmental Science and Pollution Research, Springer Nature <ul style="list-style-type: none">Authors: Saswata Chakraborty, Ranadip Saha, Sudeshna SahaDOI: 10.1007/s11356-023-30093-8 | <i>Kolkata, India</i> Sept 2023 |
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EARLY DETECTION AND MANAGEMENT OF THERMAL RUNAWAY IN BATTERIES USING WATER MIST FOR AIR PRE-COOLING

Kolkata, India

International Journal of Energy for a Clean Environment, Begell House

Nov 2022

- Authors: Aritra Jana, **Ranadip Saha**, Debamita Pal, Sourav Sarkar, Achintya Mukhopadhyay
- Volume 24, Issue 4, 2023, pp. 1-16
- DOI: 10.1615/InterJEnerCleanEnv.2022043273

CONFERENCES

CONTROL OF THERMAL RUNAWAY IN LI-ION BATTERIES USING WATER MIST FOR AIR PRECOOLING

Indian Institute of Chemical Engineers, India

INTERNATIONAL CONFERENCE ON ADVANCES IN CHEMICAL AND MATERIAL SCIENCES

Apr 14-16, 2022

- Authors: **Ranadip Saha**, Debamita Pal, Aritra Jana, Sourav Sarkar, Achintya Mukhopadhyay
- Presented at the International Conference On Advances in Chemical and Material Sciences ACMS - 2022, pp. 209-215
- Organized by Indian Institute of Chemical Engineers, Kolkata in association with National Institute of Technology, Jalandhar, Heritage Institute of Technology, Kolkata, and Osmania University College of Technology, Hyderabad

MANAGEMENT OF THERMAL RUNAWAY IN BATTERIES USING WATER MIST FOR AIR PRECOOLING

Indian Institute of Technology

Madras, India

ISHMT-ASTFE Indian Heat and Mass Transfer Conference

Dec 17-20, 2021

- Authors: Aritra Jana, **Ranadip Saha**, Samriddha Ray, Debamita Pal, Sourav Sarkar, Achintya Mukhopadhyay
- Proceedings of the 26th National and 4th International ISHMT-ASTFE Heat and Mass Transfer Conference, pp. 209-215
- DOI: 10.1615/IHMTC-2021.310

OTHERS

VISITING GRADUATE RESEARCHER

University of Michigan, USA

Michigan Battery Lab Visit

Oct 27-31, 2024

- Hands-on training on fabricating single-layer Lithium ion pouch cell batteries alongside researchers from Naval Research Laboratory (NRL) and Iowa State University.

ONLINE BATTERY HEALTH MONITORING SYSTEM FOR ELECTRIC VEHICLES

Jadavpur University, India

Innovation Fair - PRAGYAJU 1.0

5th August, 2023

- Members: Saumendra Nath Mishra, Ajit Das **Ranadip Saha**, Aritra Jana, Achintya Mukhopadhyay, Sourav Sarkar, Swarnendu Sen
- Development of an IoT based cost effective, reliable online battery health monitoring system for electric vehicle which can detect and mitigate thermal runaway successfully for Lithium ion batteries
- Model successfully displayed at the Innovation Fair hosted by Intellectual Property Cell in association with Jadavpur University Entrepreneurship Cell

Skills

Programming MATLAB, Python, C, HTML

Miscellaneous MATLAB-SIMULINK, AutoCAD, SOLIDWORKS, ANSYS Fluent, DWSIM, Machine Learning

Soft Skills Time Management, Teamwork, Problem-solving, Documentation, Engaging Presentation.

Achievements and Certifications

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| 2022 | 316/340 , GRE General Test | India |
| 2022 | 111/120 , TOEFL iBT | India |
| 2022 | MITACS , Globalink Research Internship Award | Canada |
| 2021 | A+ , Industrial Training and Internship on SOLIDWORKS and ANSYS by ASD | India |
| 2020 | Featured , International Yuva Music Festival | India |
| 2018 | 2nd , Environmental Quiz Competition organized by West Bengal Pollution Control Board | India |

Interests

Music I like to indulge myself in different genres of music and have been playing sitar since 2014

Photography I love capturing the blissful moments in nature through a lens.

Languages

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| English | Professional proficiency |
| Bengali | Native proficiency |
| Hindi | Bilingual proficiency |
| French | Basic Reading |