

Hemanth N R

Seattle, WA 98105 | ☎ +1 (206)-387-943 | ✉ [hemnr31@uw.edu](mailto:hemn31@uw.edu)
🌐 [LinkedIn](#) | 🎓 [Google Scholar](#) | 🏠 hemanthnr.com

EDUCATION

University of Washington, Seattle
MS in Materials Science and Engineering
Advisor: Prof. Guozhong Cao

2022 - June 2024 (*expected*)
GPA: 3.88/4.0

National Institute of Technology Karnataka (NITK), Surathkal, India
B.Tech in Metallurgical and Materials Engineering
Advisor: Prof. K Narayan Prabhu
Theses: Characterization of Paraffin Wax for Microelectronics and Thermal Energy Storage Applications.

2017 - 2021
GPA: 8.08/10

RELEVANT EXPERIENCE

Electric Hydrogen, Greater Boston
Cell Development Co-op

June 2023 - present

- Analyzing the two-phase flow transport in water electrolyzer using electrochemical characterization & high-speed imaging.
- Developing two-phase models using OpenCV and ImageJ libraries to perform large scale image analysis.
- Building a customized flow map for EH2's requirements to achieve desired flow regime.
- Examining the effect of catalyst, flow plates & gas diffusion layers on the flow properties at small stack level.

Sol-gel Research Group, University of Washington, Seattle
Graduate Student Researcher

September 2022 - present

- Modelling experimental and data-driven life-cycle prediction tool for lithium-ion batteries (LIBs).
- Examining the effect of temperature on LIBs performance for freight trucks.
- Interpreting cycle life of LIBs and correlating with drive cycle of electric vehicles.

Remote Research Collaboration

April 2020 - present

Funding: Department of Science and Technology under India-Korea bilateral project & NRF-Korea
Advisors: Dr. Nitin K Chaudhari & Prof. Kwangyeol Lee

- Collaborated with researchers from Pandit Deendayal Energy University, Korea University and the University of British-Columbia in interdisciplinary project grants.
- Evaluated and published articles on the performance metrics of MXene materials and their heterostructures for energy storage and neuromorphic computing applications.

Log9 Materials

November 2021 - June 2022

Chief of Climate Action and Materials & Electrochemistry Intern

- Identified the degradation mechanism in 3V and 2.7V super-capacitors using a three-electrode split cell system.
- Achieved benchmark performance in 2.7V super-capacitors at 18650 and coin cell formats by investigating electrolytes.
- Developed the one-pot synthesis process to prepare an aqueous lithium-titanate anode slurry for LIBs.
- Analyzed, interpreted & presented the cycler data of LIBs and super-capacitors in weekly team meetings.

Prabhu Research Lab, NITK

August 2020 - April 2021

Undergraduate Student Researcher

- Estimated latent heat of CNTs embedded paraffin wax using inverse heat conduction and Newtonian calculations.
- Performed characterization of paraffin wax for microelectronics and thermal energy storage applications using Differential Scanning Calorimetry.

- Reviewed & published article on developments in MXene materials for energy applications.
- Assisted PhD students in drafting & editing articles on polymers for electronics & super-capacitor applications.
- Acquired laboratory skills & working principles of characterization tools such as viscometer, UV/VIS spectrometer, electro-spinning setup, single and twin-screw extruder, probe sonicator, contact angle goniometer and melt flow indexer.

PUBLICATIONS

Book Chapters

* - equal contribution

1. **Chapter 7: MXene-transition metal compound sulfide and phosphide hetero-nanostructures for photo-electrochemical water splitting in Solar-Driven Green Hydrogen Generation and Storage**
Ranjit Mohili, **N R Hemanth**, Kwangyeol Lee and Nitin K Chaudhari.
129-139, 2023. DOI: 10.1016/b978-0-323-99580-1.00008-x.

Journal Publications

7. **Emerging High Entropy Metal Sulphide and Phosphide for Electrochemical Water Splitting**
Ranjit Mohili*, **N R Hemanth***, Haneul Jin*, Kwangyeol Lee and Nitin K Chaudhari.
J. Mater. Chem. A. 11, 10463-10472 (2023). DOI: 10.1039/D2TA10081A
6. **MXenes: promising 2D memristor materials for neuromorphic computing components.**
Monika Patel, **N R Hemanth**, Jeny Gosai, Ranjit Mohili, Ankur Solanki, Mohendra Roy, Baizeng Fang and Nitin K Chaudhari.
Trends Chem. 4, 835-849 (2022). DOI: 10.1016/j.trechm.2022.06.004
5. **Metallic Nanosponges for Energy Storage and Conversion Applications.**
N R Hemanth*, Ranjit D Mohili*, Monika Patel, Arvind H Jadhav, Kwangyeol Lee and Nitin K Chaudhari.
J. Mater. Chem. A. 10, 14221-14246 (2022). DOI: 10.1039/d2ta02057b
4. **Transition Metal Dichalcogenides decorated MXenes: Promising Hybrid Electrodes for Energy Storage and Conversion Applications.**
N R Hemanth*, Taekyung Kim*, Byeongyoon Kim*, Arvind H. Jadhav, Kwangyeol Lee and Nitin K. Chaudhari
Mater. Chem. Front., 5, 3298-3321 (2021). DOI: 10.1039/D1QM00035G
3. **Recent advances in 2D MXenes for enhanced cation intercalation in energy harvesting Applications: A review.**
N R Hemanth and Kandasubramanian, B.
Chem. Eng. J. 392, 123678 (2020). DOI: 10.1016/j.cej.2019.123678
2. **Multifunctional conjugated 1,6-heptadiynes and its derivatives stimulated molecular electronics: Future moletronics.**
RaviPrakash Magisetty, **N R Hemanth**, Pawan Kumar, Anuj Shukla, Raja Shunmugam and Balasubramanian K.
Eur. Polym. J. 124, 109467 (2020). DOI: 10.1016/j.eurpolymj.2019.109467
1. **Poly(1,6-heptadiyne)/NiFe₂O₄ composite as capacitor for miniaturized electronics.**
RaviPrakash Magisetty, **N R Hemanth**, Anuj Shukla, Raja Shunmugam, Balasubramanian K.
Polymer-Plastics Technology and Materials, 59:18, 2018-2026 (2020). DOI: 10.1080/25740881.2020.1784217

RESPONSIBILITIES

- *Graduate Chemistry Tutor - STARS program, University of Washington* *February - June 2023*
 - Taught Chemistry 142 and Chemistry 152 for ~ 30 students.
 - Mentored highly motivated Washington state residents from low-income backgrounds & under-deserved high schools to pursue degrees in engineering and computer science
- *Vice-Captain Operations & Brake Systems Head - Baja NITK Racing, Baja SAE India, NITK* *2018 - 2021*
 - Administered and designed the braking system of an all-terrain vehicle per the Baja SAE rulebook
 - Strengthened the operational strategies by forecasting budget and secured INR 3.5 lakhs funding

- Secured 1st place in marketing presentation out of 80+ teams at Baja SAE India 2018, IIT Ropar
- Ranked 11th in overall static events and 4th in cost report out of 150+ teams in Baja SAE India 2021
- Ranked 1st in B-plan and overall 2nd in the ATVC virtual championship 2021

- *Class Representative, Metallurgical and Materials Engineering, NITK Students Council* *2019 - 2021*
 - Spearheaded a class of 50 students at different levels of the student body and competitions
 - Proposed and implemented a revised course plan to improve cohesive learning and teaching methods
- *Joint Convener, Incident 2019 NITK* *2018 - 2019*
 - Organized student participation and managed logistics for the five-day annual cultural festival ~ 8,000 attendees

COURSEWORK ---

- Imaging at nanoscale and atomic scale, nanostructures and nanomaterials (thin-films, chemical/physical vapor deposition, lithography, spectroscopy), defects in materials, electron theory of materials.

TECHNICAL SKILLS ---

- *Engineering skills:* Non-destructive testing, MIG welding, Failure analysis & Metallographic examination.
- *Computer skills:* Python, OpenCV, ML Modeling, Vesta, Neware battery cycler, BioLogic, Catia, MS Office, Origin pro & C.