

Pooja Ranganathan

Email : prangan@purdue.edu

EDUCATION

Purdue University

PhD program, Department of Mechanical Engineering

August 2022 - Present

BITS Pilani, Hyderabad

Integrated M.Sc program

B.E(hons) in Mechanical Engineering

M.Sc(hons) in Chemistry

August 2013 - July 2018

St. Patricks Junior College

Class XII

July 2012 - May 2013

Sachdeva School

Class X

June 2010 - May 2011

RESEARCH EXPERIENCE

Energy and Transport Sciences Laboratory, Purdue University

Graduate Research Assistant

Aug 2022 - Present

- Core team member of 'Center for Advances in Resilient Energy Storage', a brainchild of the joint forces of Purdue University and Electrochemical Safety Research Institute (ESRI). My role involves examining alternative chemistries to achieve sustainable energy storage systems
- Carrying out synergistic design and optimization of electrolytes and anode composites for minimizing the capacity degradation of sodium ion batteries
- Development of electrolyte formulations and additives for enhancing thermal stability of sodium metal batteries.

Bits Pilani Hyderabad Campus

Project Assistant

December 2021 - June 2022

- Carried out research project titled "Synthesis and characterization of silver magnetite nano-fluid for heat transfer applications".
- The duties involved synthesis of magnetite nano-fluids and optimizing the surface functionalization through quaternization of ammonium groups.
- The end product is characterized through XPS, FESEM, UV-Visible spectroscopy etc, to examine the modification in chemical composition and thermal stability of nano-fluid.

Indian Institute of Science

Project Assistant(Interdisciplinary Center for Energy Research)

Nov 2019 - May 2020

- Devised a centrifugal compressor for an air-cycle machine of the 'Tejas' aircraft, a fighter jet of the Indian Defence. The project was funded by DARE-DRDO to optimize the design of the same.
- Calculated the parameters such as the blade angles, impeller radius and the co-efficients subjected to a specific mass flow rate. Aerodynamic performance optimization of 3D model carried out in Ansys CFX.

- Worked on optimizing the heat treatment parameters of annealing time and temperature, for enhancing the spectral selectivity of metal/alloy surfaces
- Characterized the optimized samples for composition and optical properties to rationalize the increase in absorption
- Received a scholarship of merit for presenting the same from the alma-matter

PUBLICATIONS

Pooja Ranganathan, V. Amrutha, H.C. Barshilia, Thermal oxidation of stainless-steel substrate with tunable spectral selectivity: transition from a reflecting to a highly absorbing Cr-Fe spinel surface, Sol. Energy Mater Sol. Cells, 233 (2021), Article 111381, <https://doi.org/10.1016/j.solmat.2021.111381>

SELECT HONORS AND AWARDS

2024 Travel grant winner - 3rd Annual GWEN(Graduate Women in Engineering Network) symposium, Purdue University

2018 Practice School Merit Scholarship - Bits Pilani Hyderabad Campus, India

DEPARTMENTAL SERVICE AND ENGAGEMENT

Vice President and Event Co-ordinator

Electrochemical Society (Purdue Chapter)

- Introduced the 'Modeling-Characterization Workshop series' as a part of events conducted by Purdue ECS Chapter for engineering graduate students.
- Convened researchers across various disciplines for a collective learning experience. Aim to enhance electrochemistry and materials engineering fundamentals as an integral part of graduate students' learning through interactive workshops

Women in ME Chair

Purdue Omega Association

- Designated as the 'Women in ME Chair' for the school year 2024-2025, as a liaison between the graduate women in Mechanical engineering and the ME department leadership.
- Looking forward to organize technical workshops and informative sessions through female alumni in academic and industrial positions.

Leadership team member

Engineering Academic Career Club, Purdue University

- Appointed as the leadership team member at large to improve upon the logistics of existing events and provide resourceful inputs to the leadership team on ideating panel sessions

Graduate Mentor

Purdue Society for Women Engineers

- Volunteered as a mentor for the 'Undergraduate to Graduate mentorship program'.
- Guided an undergraduate student on the application process, choosing a research lab, approaching Professors for a research position and many more experiences to expect as a graduate student.

UNDERGRADUATE PROJECT WORK

Synthesis and characterization of nano-particles for nano-fluid applications Aug 2017 - Dec 2017

Experimental project

- The Microwave Synthesis of TiO₂ Nanoparticles was carried out to be suspended in Graphene Oxide solvent. The chemical functionalization of GO was an advantage to stabilize the solution
- The time period of photo-catalytic reduction of the TiO₂-GO solution was optimized for a prolonged dispersion of nano-particles
- The samples were characterized by XRD, UV Visible Spectroscopy, FTIR Spectroscopy, Raman Spectroscopy and DLS to conclude the optimized time period of reduction leading to highest stability of the nno-fluid

A DOE based Simulation studies for design of an ISO 5 Clean-room Jan 2017 - Apr 2017

Design oriented project

- Employed Comsol Multiphysics to optimize the control parameters and fluid flow in an ISO 5 Cleanroom
- The placement of inlet and outlet configurations were the variable parameters to arrive at a streamline flow and to avoid any back-pressure in the Clean-room with distinct work-spaces
- The project was being constructed in Bits Pilani Hyderabad Campus for MEMS fabrication

CFD based aerodynamic studies of a 2D NACA 2412 airfoil configuration Jan 2016 - Apr 2016

Design oriented project

- A design oriented project aimed at studying the Lift and Drag characteristics of NACA 2412 airfoil configuration and to arrive at the stall.
- Simulation studies had been carried out in Ansys Fluent, with wind velocity and angle of attack as the variable parameters

TECHNICAL PRESENTATIONS

3rd Annual GWEN Symposium

Purdue University

Delivered technical presentation on 'Synergistic Influence of Anode Composition and Electrolyte Interactions in Sodium-Ion Cells'

2024 OIGP Spring Reception

Purdue University

Poster presentation on 'Sodium ion batteries an an evolviog technology: Progressing past lithium ion frontier '

SKILLS

Design and Simulation tools

Autocad, Creo Parametric, Ansys Fluent, Comsol Multiphysics, Ansys CFX

Programming/Statistical Softwares

MS Excel, MySQL, R, Origin

Languages

English, Kannada, Tamil, Telugu, Hindi