Raman

Ph.D. Student, Chemical Engineering
The University of Texas at Austin

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ACADEMIC DETAILS

Year	Institution	Degree	GPA
2022-Present	The University of Texas at Austin	Ph.D. Chemical Engineering	4.0/4.0
2016-2020	IIT Gandhinagar	Bachelor of Technology	9.17/10
2016	D.A.V Public School, Kurukshetra	Class XII (CBSE)	90.8%
2014	Maharana Pratap Public School, Kurukshetra	Class X (CBSE)	10/10

RESEARCH WORK

- **Graduate Research Assistant, Chemical Engineering, UT Austin**
  (PhD Advisors: Dr Manish Kumar and Dr Benny Freeman) *(Oct'22 to present)*
  - Working on scaling up the Aquaporin based membranes
  - Learning processes like protein purification and protein crystals synthesis for this purpose.
- **Junior Research Fellow, Chemical Engineering, IIT Gandhinagar**
  (Guide: Prof. Sameer V. Dalvi) *(Mar'21 to May'22)*
  - Worked on the research project based on Micronization and Encapsulation by expansion of CO2 expanded liquid solutions by using Precipitation by Pressure Reduction of Gas-Expanded Liquid (PPRGEL) method for producing supersaturation and hence crystallization.
  - Worked on Antisolvent Crystallization to compare size reduction and morphology.
  - Worked on Molecular Dynamics Simulation to understand the interaction between solute-solvent molecules.
  - Worked on Mathematical modeling of supersaturation of salt solution in Liquid Marble Setup.
- **Interaction of Boron Based Nanosheets with Methylene Blue Dye Molecules in Aqueous Dispersions: Adsorption and Aggregation Behaviours**
  (Guide: Prof. Kabeer Jasuja) *(May'18 to Apr'19)*
  - Aim of the project is to determine the reason for the unexpected behaviour of boron based nanosheets upon interaction with methylene blue dye molecules in aqueous dispersion.
  - Synthesis and characterization of boron based nanosheets was performed.
  - Experiments were performed with different concentrations of Nanosheets and dye molecules and UV-Visible spectra was analysed.
  - Hypothesis was made the along with getting adsorbed in nanosheets, dye molecules were also getting aggregated in presence of boron based nanosheets.

TEACHING WORK

- **Graduate Teaching Assistant, Chemical Engineering, UT Austin**
  (Course: Thermodynamics, Course Instructor: Prof. Thomas Edison) *(Jan'23 to Present)*
  - Responsible for conducting office hours and solving doubts of students
  - Learning Interpersonal and Communication skills

INDUSTRIAL WORK

- **Management Trainee, Dai-ichi Karkaria Limited, Bharuch**
  (Place: Bharuch, Gujarat) *(Sep'20 to Feb'21)*
  - Worked in the department of production and pilot plant as a Management Trainee.
  - Gained understanding about functioning of small scale industry from management prespective.

CONFERENCE PRESENTATION

Dhiman, Raman; James, Asha Liza; Khandelwal, Shikha; Dutta, Arnab and Jasuja, Kabeer, "Interaction of Methylene blue with boron based nanosheets: adsorption and aggregation behaviour", in the 3rd International Conference on Soft Materials (ICSM 2018), Malaviya National Institute of Technology, Jaipur, IN, Dec. 09-14, 2018.

SKILLS

- **Laboratory Skills:** Protein Purification, Protein Crystal Synthesis, Fast Protein Liquid Chromatography(FPLC), Transmission Electron Microscopy(TEM), Dead-End Filtration, High Pressure Experiments, Raman Spectroscopy, UV-Visible Spectroscopy, Optical Microscopy, Particle Size Analysis
- **Programming Language:** Python(Basics)
- **Software:** ASPEN Plus, Simulink, COMSOL Multiphysics, ANSYS Fluent, Autodesk Inventor

COURSE PROJECTS

- **Setting up of PVC pellets manufacturing industry**
  (Process Plant Design: How to set up a process industry, Instructor: Prof. S.P. Mehrotra) *(Spring 2019-20)*
  - Worked in a group of three students to make a detailed plan for establishing a fully functional PVC pellets manufacturing process industry with production capacity of 200 tonnes/day.
  - The project includes market study for demand of PVC pellets; Study of Raw material and equipment requirement; Selection of location; manufacturing process design; Techno-economic analysis; Safety analysis; Marketing strategy for Sale of produced pallets.
- **Denitrification of wastewater using Citrobacter**
  (Mass Transfer and Reaction Engg. Lab, Instructor: Prof. Pratyush Dayal) *(Spring 2018-19)*
  - Aim of the project was to reduce the nitrate content in wastewater by 80%.
  - Learnt about Nitrate detection methods; Autoclaving techniques; cultivating Citrobacter.
  - Reduced the nitrate content in wastewater by 90%, a 10 percentage points improvement over the target for this project.
  - Report submitted was mentioned as one of the two best reports by course instructor.
- **Designing a plate distillation column**
  (Separation Processes, Instructor: Prof. Kaustubh Rane) *(Spring 2018-19)*
  - Worked in a group of four students in order to design a plate distillation column for separating a feed mixture containing 60% n-Hexane and 40% n-octane and to obtain 95% n-haxane and 5% n-octane as distillate.
  - Project involves selection of plate type; equilibrium analysis; application of McCabe Thiele Method; plate design; cost analysis.
- **Fabricating the prototype of water cooler using a peltier device**
  (Heat and Mass Transfer, Instructor: Prof. Atul Bhargav) *(Fall 2018-19)*
  - Worked in a group of six students in order to design the heat exchanger for using in water cooler.
  - Simulated the design in COMSOL Multiphysics and fabricated the prototype.

ACHIEVEMENTS

- Received **Sellers Family Endowed Presidential Fellowship** in Chemical Engineering for 2022-2023
- Received **Dr. Thomas F. Edgar Endowed Graduate Fellowship** in Chemical Engineering from the Cockrell School of Engineering for Spring 2022-2023.
- **Institute Silver Medal** for securing the second-highest CPI among all the recipients of the degree of Bachelors of Technology in Chemical Engineering at the 9th Convocation of IIT Gandhinagar held on 23rd August 2020.

POSITIONS OF RESPONSIBILITY

- **Co-ordinator, Tinkerers' Lab, IIT Gandhinagar** (*Mar'17 to Mar'18*)
  - Worked in a team to establish Tinkerers' Lab which provides freedom and facility to students to innovate.
- **Senator, Student Senate, IIT Gandhinagar** (*Sep'16 to Mar'17*)
  - Responsible for communicating different concerns faced by the batch to the university administration.

ACADEMIC ACTIVITIES

- **Earn While You Learn (EWYL), Library Services, IIT Gandhinagar** (*Jul'19*)
  - Analysed around 100 articles from AIChE's Chemical Engineering Progress (CEP) magazine and recommended the suitable once to the library for sharing them with undergraduate students in order to enhance their understanding of fundamental Chemical Engineering concepts.
- **PAL (Peer assisted learning) Mentor, IIT Gandhinagar** (*Sep'17 to April'18*)
  - Mentored two undergraduate freshmen and helped them adapt to English as the primary medium of instruction.
- **Participant, India ki Khoj** *(Dec'17)*
  - Attended lecture series by distinguished speakers and went for field visits along with students of CalTech, USA, and JAIST, Japan to study and explore different facts about Indian culture.

EXTRA CURRICULAR ACTIVITIES

- **Recipient, Explorer Fellowship** (*May'17 to Jun'17*)
  - Travelled across the country for 42 days to explore the diversity of India.
- **Member, Marketing Team, Amalthea (Technical Summit, IIT Gandhinagar)** *(Aug'16 to Oct'16)*