DEV PATRA J21IMT614
I.Mtech (B-tech+M-tech) Chemical Engineering (Major) Material Eng. & Polymer (Minor)
Institute of Chemical Technology, Mumbai Marathwada Campus **Birthdate** : **7th OCT 2003**

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Career Objective: I'm a Chemical Engineering student with a programming, research, and modelling background. Even with this background, my main focus is on collaborating and always learning different skills outside my domain to help me in working on challenging projects where I can grow & contribute.

Educational Qualifications (Pre-University)

Examination	Institution (name, place, state of Institution)	%Marks
S.S.C. (2019)	St. Teresa's Convent Higher Secondary School, Jalgaon, Maharashtra.	86.80
H.S.C. (2021)	Chatrapati Shivaji Junior Science College, Jalgaon, Maharashtra.	89.83

Educational Qualifications (ICT)

Integrated M.Tech							
Trimester	**Year**	**%Marks / SGPA**	**CGPA**	**Trimester**	**Year**	**%Marks / SGPA**	**CGPA**
I	2022	9.86	9.86	VIII	2024	9.68	9.91
II	2022	9.92	9.89	IX	2024	10.00	9.92
III	2022	10.00	9.91	X	2025	9.85	9.91
IV	2023	10.00	9.94	XI	2025	10.00	9.91
V	2023	10.00	9.94	XII	2025	9.80	9.9
VI	2023	10.00	9.96	XIII			
VII	2024	10.00	9.96	XIV			

In-Plant Trainings:

1. Dow Chemical Company, Mumbai, Maharashtra
Research & Development Intern **June 2025 – Present**

- Working presently as a Research & Development intern at Dow Chemical Company.

2. Reliable Process Design Solution (RPDS), Pune, Maharashtra
Data Analytics Intern **March 2024 – June 2024**

- Developed intuitive GUIs using Tkinter and web apps with Streamlit, enhancing user experience for industrial tasks.
- Worked on implementation of NN-MPC, traditional MPC, and optimized PID control systems in batch polymerization reactors, resulting in a **faster cycle time**.
- Achieved **70% improvement in setpoint settling time** through optimization of PID using Differential Evolution algorithms.
- Conducted comprehensive fault analysis on the Tennessee Eastman Process using AI/ML, identifying around **20 faults** with high accuracy.

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3. Defence Institute of Advanced Technology (DIAT), DRDO, Pune, Maharashtra
Research Intern **September 2023 – October 2023**

- Developed a comprehensive ML and AI-based framework to predict the removal efficiency of heavy metals from industrial wastewater using biochar.
- Designed and tested **12 hybrid ANN-metaheuristic models** (CSA-ANN, TLBO-ANN, PSO-ANN, etc.) and **22 ML models**, including SVM, GPR, and ensemble methods like LSBoost.
- Implemented **10+ nature-inspired optimization algorithms** (PSO, TLBO, Cuckoo Search, etc.) to fine-tune ANN predictions and compare modelling strategies.
- Collaborated with **DRDO and VIT, Vellore** under the guidance of **Dr. Amrita Nighojkar** and co-authors from VIT, contributing to a conference paper at ICMLDE 2024.

Academic Achievements:

Research Articles

1. *Dev K Patra, Debashis Kundu* – "Generalized Pitzer-Debye-Hückel (PDH) Framework for the Deep Eutectic Solvent Assisted Extraction of Europium (III), Americium (III), and Uranium (VI)", Taylor & Francis *View Online*

2. *Dev K Patra, Debashis Kundu* – "Systematic Exploration of COSMO-SAC-PDH and EXT-UNIQUAC-PDH Models for Rare-Earth Element Leaching in Deep Eutectic Solvents", American Chemical Society (ACS) *View Online*

Book Chapter

1. *Dev K Patra, Debashis Kundu* – "Deep Eutectic Solvents in Dissolution of Lanthanides, Actinides, and Recovery of Value-Added Materials from Electronic Waste", Elsevier *View Online*

Conference

Presented paper titled *"Predictive Models for Removing Heavy Metal Water Pollutants with Biochar: Exploring Neural Networks and Machine Learning"* at **ICMLDE 2024**, Dehradun *View Online*

Projects

Work Under Review:

NAMoSTe Software (Novel Atomic & Molecular Structure Explorer)

(Intellectual Property Secured; Registered with the Copyright Office, Government of India – Extracts from the Official Register of Copyrights)

NAMoSTe is a next-generation software designed for the intuitive creation and visualization of complex long-chain polymers in 1D, 2D, and 3D. While helping advanced molecular modelling capabilities, it empowers researchers to precisely construct and analyse polymer architectures.

Positions of Responsibilities:

Web Design Head & Treasurer – Techfest AAKRITI 1.0: Led the web design team, creating an interactive digital platform, while **managing finances** to ensure smooth planning and execution of the tech festival.

Student Editor – MarJal (ICT Mumbai, MarJ Campus): Edited *MARJAL*, the biannual magazine of ICT Mumbai, MARJ Campus. Oversaw content creation, managed a team of writers, and ensured high-quality publications.

About Me:

Computer Knowledge: Python, MATLAB, DWSIM, C, C++, R, MS Word, Excel, PowerPoint, Aspen
Language Skills: English (Full Professional), Hindi & Marathi (Elementary), Bengali (Native)
Interests and Hobbies: Exploring GUI/Web Design, enjoy reading, and am a State-Level Table Tennis player

WHAT I BRING TO THE TABLE : As a Chemical Engineering student with a unique blend of coding, research, and data-driven problem-solving skills, I bring a rare combination of depth and interdisciplinary versatility. I offer *quick learning* and a deep commitment to *teamwork* and *results*. Whether it was *working late* with my team at DRDO to perfect biochar AI models or improving industrial control systems at RPDS under tight deadlines, I've always been driven by passion and purpose. I don't just complete tasks—I take *ownership, collaborate* with others, and ensure that outcomes create real value. I'm adaptable, enthusiastic, and eager to contribute meaningfully to every project I take on.