Darshan Jogani

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Education

Otto-von-Guericke University — Magdeburg, Germany
M.Sc. in Chemical and Energy Engineering — *Apr 2020 – June 2025*

Relevant coursework: Process Optimization, Machine Learning in Chemical Engineering, Electro-chemical Process Engineering, Fuel-Cell Technology, Thermal Process Engineering, Chemical Reaction Engineering, Advanced Fluid Dynamics, Mechanical Process Engineering, Combustion Engineering, Plant Design, Process System Engineering.

Faculty of Engineering, Technology, and Research — Bardoli, India
B.E. in Chemical Engineering — *Aug 2013 – May 2017*

Relevant coursework: Electro-Chemistry, Chemical Engineering Thermodynamics, Heat and Mass Transfer, Reaction Engineering, Multi Component Distillation, Unit Operations and Unit Processes, Transport Phenomena, Computer Aided Process Synthesis, Petroleum Refining and Petrochemicals, Process Calculations.

Technical-Skills

Programming & Data Science : Python, MATLAB, PyTorch, TensorFlow, CUDA, OOP, Optimization

Process Modeling & Simulation : Aspen Plus, ChemCAD, DWSIM, Simulink

Computational & Productivity : LaTeX, Markdown, Jupyter Notebook/Lab, Git, Office Tools, PowerBI

Projects

Master Thesis | Techno-Economic Analysis and Optimization of an alkaline water electrolysis in Power-to-Methanol process.

- Developed AspenPlus®-based simulation model for High-Pressure AEL (detailed), DAC, and Methanol Synthesis & Purification to assess system performance.
- Conducted multi-variable optimization & parameter sensitivity analysis using python-based tools to improve efficiency and reduce Net Production Cost (NPC) of Hydrogen and Methanol.
- Utilized techno-economic modeling to evaluate feasibility, providing recommendations for optimal operation conditions.

Optimal operation of a methanation reactor | *Python, Optimization, Matplotlib, VS Code, ODE Solver* 2024

- Applied optimization methods to find the best operating conditions for a methanation reactor.
- Aimed to increase the methane output.
- Demonstrated practical application of theoretical knowledge.

Machine learning in chemical engineering | *Jupyter Notebook, Neural Network, Gaussian Processes* 2023

- Applies machine learning theories to chemical engineering using Jupyter notebooks.
- Trains models with various algorithms to evaluate performance.
- Analyzes results to gain insights into practical implementation of theoretical knowledge.

Control of a multi-variable process - Newell and Lee evaporator | *MATLAB, Simulink, Python* 2021

- Mathematical modeling and analysis of system degrees of freedom.
- Steady-state solutions for ODE systems and dynamic behavior simulation using MATLAB and Simulink.
- Includes numerical linearization and stability analysis of linearized process models.
- Design and testing of controllers for performance optimization under step change conditions.

Bachelor Thesis | Effect of a common salts, organic solvents, and ionic liquids on a separation of a close boiling compound.

- Explores eco-friendly separation of close-boiling, azeotropic mixtures (e.g., ethanol-ethyl acetate).
- Replaces traditional solvents with green leachant ionic liquids.
- Selects the best solvent for the separation process and correlates VLE data with different models for accuracy.
- Optimizes the separation process using simulations in ChemCAD and MATLAB.

Experience and Excursions

German Aerospace Center Stuttgart, Germany
Student Research Assistant *Aug 2024 – March 2025*

- Developed AspenPlus® and python-based simulation modeling & optimization framework for the techno-economic analysis of high-pressure AEL in a Power-to-Methanol (Pt-MeOH) process, identifying cost-effective operational strategies.

Entrepreneurship & Language Acquisition Surat, India
Jun 2018 – Fab 2020

- In about two year time period, operated a small business and prepared for IELTS and German proficiency (A1 and A2). Also simultaneously started an admission process in German universities. Then came the pandemic and I had to do my first semester remotely.

ATUL Ltd., Aromatics division Ankleshwar, India
Summer Intern *Apr 2018 – May 2018*

- During this industrial internship, got hands-on experience in industrial operations, emergency situations. I studied various plants including process plant (Phenol, o-Cresol, p-Cresol, Xylenol), MEE plant, ETP plant, and RO plant, gaining practical insights into industrial operations.

HLE Engineering Ltd. Maroli, India
Excursion *Jun 2016*

- On this educational excursion, got an opportunity to delve into the intricacies of how process equipment is designed and manufactured. I was able to observe firsthand the various stages of production, from initial design concepts to the final manufacturing processes. This experience provided a comprehensive understanding of the complexities involved in creating industrial equipment, enhancing my knowledge and appreciation for this field.

CHEMINOVA India Ltd. Panoli, India
Excursion *Apr 2015*

- During an excursion, visited one of the largest fertilizer plants in the southern part of the Gujarat. This visit provided a unique opportunity to learn about the intricate processes involved in fertilizer production, from raw material processing to the final product. It was an enlightening experience that expanded the understanding of the industry.

Kakrapar Atomic Power Station (KAPS), NPCIL Ukai, India
Excursion *May, 2014*

- In an educational excursion, visited an atomic power station. This visit provided a unique opportunity to understand the complex processes involved in nuclear power generation. From the reactor's operation to the safety measures in place, it was a valuable experience that expanded knowledge of nuclear energy production.

Soft-Skills

- Ability to work independently
- Attention to detail
- Analytical thinking and problem-solving
- Strong written communication skills
- Active listening
- **Languages:**

  German – Intermediate (Actively Improving)
  English – Proficient
  Hindi – Native/Bilingual
  Gujarati – Native/Bilingual