MOHAMMAD LOTFI-VARNOOSFADERANI

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Website ⋄ Google Scholar ⋄ Linkedin ⋄ Skype

EDUCATION

- **Ph.D. in Environmental Engineering** 2023 - present
  University Of Alberta (UofA)

- **M.Sc in Chemical Engineering (Separation Processes)** 2019 - 2022
  Sharif University of Technology (SUT)

  CGPA: 17.40/20.00 (3.85/4.00)
  Thesis: Modeling and Simulation of Electrochemically Mediated Amine Regeneration

- **B.Sc in Chemical Engineering** 2015 - 2019
  University of Isfahan (UI)

  CGPA: 17.22/20.00 (3.62/4.00)
  Last two years CGPA: 18.46/20.00 (4.00/4.00)
  Final project: Conceptual design of methanol(CH_3OH) production unit

RESEARCH INTERESTS

- **Air Pollution control**
- **Reaction Engineering**
- **Adsorption**
- **Process Modeling & Simulation**

PUBLICATIONS

- M. H. Khademi, **M. Lotfi-Varnoosfaderani**, "Use of biomass-derived glycerol as an alternative to fossil fuels for aniline production: Energy saving and environmental aspects," *Fuel* , vol. 310, p. 122359, Feb. 2022, Doi ↗ .

- M. H. Khademi, **M. Lotfi-Varnoosfaderani**, "Sustainable ammonia production from steam reforming of biomass-derived glycerol in a heat-integrated intensified process: Modeling and feasibility study," *J. Clean. Prod.*, vol. 324, p. 129241, Nov. 2021, Doi ↗ .

- M. H. Khademi, **M. Lotfi-Varnoosfaderani**, and M. H. Moghadasin, "Catalytic conversion of bio-renewable glycerol to pure hydrogen and syngas: Energy management and mitigation of environmental pollution," *Energy Convers. Manag.*, vol. 247, p. 114719, Nov. 2021, Doi ↗ .

- M. H. Khademi, **M. Lotfi-Varnoosfaderani**, and A. Palizvan, "Partial Oxidation Process For Syngas Production," *Advances in Synthesis Gas: Methods, Technologies and Applications: Syngas Production and Preparation* , Book Chapter, Elsevier, 2022, Link ↗ .

- M. H. Khademi, **M. Lotfi-Varnoosfaderani**, "Modeling and simulation of natural gas reforming by membrane," *Advances in Natural Gas: Formation, Processing, and Applications* , Book Chapter, Elsevier, 2022
  To be submitted

SELECTED PROJECTS

- **Modeling and Simulation of Electrochemically Mediated Amine Regeneration** *2021 –2022*

  . Investigated the Electrochemically Mediated Amine Regeneration method as an alternative for amine recovery in amine-based absorption carbon capture.
  . Developed a two-dimensional dynamic model to investigate the system's behavior.
  . Used COMSOL Multiphysics software to simulate the Electrochemically Mediated Amine Regeneration cell.
  . Investigated the system's parameters' effect on the function of the electrochemical cell.

- **Simulation and CFD Analysis of 2D-Non Reactive Fluidized Bed** *2021 –2021*

. Simulated the hydrodynamics of a two-dimensional non-reactive solid-gas fluidized bed by Ansys FLU-ENT 2019 R3 software

- **Simulation of Capillary Flow in a Microchannel.** *2021 – 2021*

  . An Electrochemical Glucose Sensing Platform
  . Evaluated A three-dimensional channel with cylindrical obstacles with an outer diameter of 350 μm

- **Conceptual Design Of a Reverse Osmosis Plant.** *2021 – 2021*

  . Investigated a reverse osmosis plant with a desalination capacity of 2000 m3/d
  . Used GPS-X software to design the pre-purification steps to achieve a TSS concentration below 5 mg/L
  . Used The WAVE software to design the reverse osmosis unit with 35 % recovery
  . Performed Economic calculations related to process by ROSA software

- **Simulation of Retrieval of Circulating Tumor Cells Via Centrifugal Forces.** *2020 – 2020*

  . Investigated A two-dimensional spiral microfluidic channel with inner semi-circular channel with radius $R_1 = 0.42$ cm and a spiral channel $R_2 = (1.0 + 0.1\ \theta/2\pi)$

- **Conceptual Design of Methanol (CH$_3$OH) Production Unit** *2018 –2019*

  . Bachelor's final project
  . Team leader of this project
  . Developed BFD, PFD, and P&ID diagrams
  . Simulated the manufacturing process by Aspen-Hysys
  . Performed market analysis and economic estimations

EXPERIENCES

- **Research assistant**

  Graduate Research Assistant *2020 – Present*

  . Reading and reviewing related papers
  . Implementing ideas process
  . Testing and improving the written code
  . Gathering information and writing the initial text for the papers

  Iran's National Elites Foundation ⌯ *2019 – 2020*

  . Design and fabrication of a small packed bed deaerator toward scale up
  . Reviewed and modified process design and calculation for the Deaeration process
  . Modeled the Process & Designed the pilot plant

  Iranian Chemical Parks Development Company (ICPDC) ⌯ *2019 – 2019*

  . Collaborated in pre-feasibility study
  . Studied Human resource, industries and mines, Basic substructure of the region

- **Teaching Assistant**

  Transport phenomena II *2021 – 2021*

  . Taught Heat & Mass transfer to 30 undergraduate students of Petroleum engineering
  . Designed Quiz questions and corrected student's homework

  Advanced transport phenomena (two times) *2021 – 2021*

  . Taught COMSOL Multiphysics to 20 graduate students of Chemical engineering

. Corrected student's homework

- **Mentor**

  COMSOL Multiphysics Mentor *2021 – 2022*

  . Published by FaraDars Tutorial link ⬈
  . Providing 4 hour Persian tutorial for Heat transfer modules of COMSOL Multiphysics Software
  . Demonstrated video tutoring using an online platform
  . Designed course and material contents and assignments

- **Internship**

  Iran Chemical Industries Investment Company (ICIIC) ⬈ *2019 – 2019*

  . This company produces LAB (Linear alkyl benzene) for the detergent industry.

HONORS AND AWARDS

- Selected as a distinguished student of the Chemical Engineering Department
- Ranked 1st among chemical engineering students at Sharif University of Technology (entrance 2019)
- Met the Criteria and participated as a Faculty representative for Iran's Chemical Engineering Olympiad
- Ranked 1st among chemical engineering students at University of Isfahan in last two years (entrance 2015)
- Ranked 4th among chemical engineering students at University of Isfahan (entrance 2015)
- Admitted to the M.Sc. program of Chemical Engineering without the entrance exam as a talented student, University of Isfahan
- Ranked 5th among more than 10000 participants in chemical engineering M.Sc. entrance exam of universities of Iran
- Ranked 18th among more than 5000 participants in biotechnology engineering M.Sc. entrance exam of universities of Iran
- Awarded by government undergraduate tuition waiver scholarship

SKILLS

- **Programming**
- **Simulation**
- **Frameworks & Libraries**
- **Other**
- **Soft Skills**

- Matlab, Python
- Comsol Multiphysics, Ansyns Fluent, ICEM CFD , Aspen Hysys
- Numpy, Pandas, Matplotlib, Scikit-learn, SciPy, Seaborn
- Jupyter, Git, LaTeX , Microsoft Office, Visio, Design expert, AutoCad
- Teamwork, leadership, Collaboration

ENGLISH

- **TOEFL iBT**

  Overall 104/120
  . Reading 28/30 - Listening 28/30 - Speaking 22/30 - Writing 26/30