Majid Ahmadlouydarab

PhD & PDF

Chemical Engineer

Associate Professor

Faculty of Chemical & Petroleum Engineering

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Summary:

- ***Associate Professor*** of Chemical and Petroleum Engineering at University of Tabriz.
- ***Head of Department*** of Chemical and Petroleum Engineering at University of Tabriz.
- Selected as ***Distinguished professor of Technology*** at University of Tabriz.
- ***CEO*** of ***INTEL*** (**In**novative **Te**chnologies **L**aboratory)**.**
- ***Eight years*** of teaching and research experience in "**North America**".
- ***Three years*** served as a fulltime faculty member at Sahand U of Tech.
- ***Three years*** served as manager of the Talented Students Office at Sahand U of Tech.
- ***60+ Published papers*** in peer reviewed journals such as:
    - ***Geoenergy Science and Engineering/Petroleum Science and Engineering,***
    - ***Journal of Fluid Mechanics,***
    - ***Applied Thermal Engineering,***
    - ***Langmuir,***
    - ***Physical Review E,***
    - ***Fuel,***
    - ***Renewable Energy,***
    - ***Physica A,***
    - ***Physica Scripta,***
    - ***European Journal of Mechanics/B,***
    - ***International Journal of Multiphase Flows,***
    - ***Journal of the Taiwan Institute of Chemical Engineers,***
    - ***Chemical Engineering Research and Design,***
    - ***Advanced Powder Technology,***
    - ***Journal of Environmental Chemical Engineering,***
    - ***Journal of Thermal Analysis and Calorimetry...***
- ***100+ Presented papers*** in international and national conferences.
- Participated in university level teaching workshops in USA; Developing Teaching Strategies (**DTS**), and Improving Teaching by Assessing (**ITA**).
- Participated in university level teaching workshops in Canada; Teaching in Canadian Classrooms (**TCA**), and Instructional Skills workshop (**ISW**).
- Conducted original experimental and theoretical researches to address scientific and/or industrial challenges and opportunities.
- Expert in commercial engineering software e.g., Ansys-Fluent, Hysys, Matlab, C++, FORTRAN.

Education/Training:

Chemical Engineering (PDF) — May 2015- Aug 2016
Water and Energy Laboratory, University of California (UCM), USA
***Projects**: Interfacial flows, pores-scale flows, microfluidics*

Chemical Engineering (PDF) — Aug 2013- Apr 2015
Reservoir Simulation Group, CCIT, Calgary, Canada
***Projects**: Hot fluid injection, water flooding, steam injection*

Chemical Engineering (PhD) — Sep 2009- Jun 2013
Complex Flows Laboratory, University of British Columbia, Canada
Dissertation: "Numerical simulation of interfacial flows in micropores"

Chemical Engineering (MSc) — Sep 2001- Apr 2004
Flow Simulation Laboratory, Sharif University of Technology, Iran
Thesis: "Simulation of 3D blood flow in coronary arteries"

Chemical Engineering (BSc) — Sep 1997- Sep 2001
Process Design Laboratory, Sahand University of Technology, Iran
***Thesis:** "Design and build of a lab-scale CO_2 absorption packed bed tower"*

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Scopus: https://www.scopus.com/authid/detail.uri?authorId=51664441400

Selected National and International Funded Projects:

1. Energy efficiency and environmental management through green power plant design using thermal power tower technology with sour flare gas combustion, (National Iranian Oil Company, Iran).
2. Using dynamic energy from fluid flow output from oil and gas wells to generate electricity, (National Iranian Oil Company, Iran).
3. Design and manufacture of solar cells using soil or fluid as an energy transfer and storage medium, (University of Tabriz).
4. Application of MDPD computational method in nanotechnology, (University of California, USA).
5. Hot fluid injection to increase oil recovery from wells, (University of Calgary, Canada).
6. Numerical simulation of interfacial flows in porous media, (NSERC, University of British Columbia, Canada).

Awards:

- Distinguished Professor of Technology at University of Tabriz, 2024, Iran
- Dr. Kazemi Ashtiani Award, 2017, Iran
- Postdoctoral Fellowship Award, 2015 to 2017, University of California, USA
- Postdoctoral Fellowship Award, 2013 to 2015, University of Calgary, Canada
- 2nd place among 17 participant groups in best problem based TA selection, 2013, UBC, Canada
- Graduate Entrance Scholarship, 2009, UBC, Canada
- Partial Tuition Fee Scholarship, 4 years, 2009 to 2013, UBC, Canada
- Research Assistantship, 4 years, 2009 to 2013, UBC, Canada

Languages:

- Turkish Azeri (Mother tongue)
- Turkish Istanbuli (Fluent)
- English (Fluent)
- Persian (Fluent)

Committee member:

- Scientific Committee Member of First National Conference of Optimizing in Renewable Energies, 2020. http://ore2020.jsu.ac.ir/fa/page.php?rid=46

Honors:

- 1st place among all the participants in 2nd TPEC (Tondgooyan Petroleum Engineering Competition), Iran, 2024.
- 1st place among all the participants in 1st TPEC (Tondgooyan Petroleum Engineering Competition), Iran, 2023.
- Winner of 12 awards and scholarships for PhD study, Canada, 2009 to 2014.
- 2nd place among the graduated BSc chemical engineering students, Iran, 2001.
- 15th place among 2437 participants in national MSc entrance exam, Iran, 2001.

Selected certificates:

- **Developing Teaching Strategies,** (2016, U of California, USA)
- **Improving Teaching by Assessing**, (2016, U of California, USA)
- **Instructional Skills Workshop,** (2010, UBC, Canada)
- **Trained in WHIMIS,** (2009, UBC, Canada)
- **Teaching in Canadian Classrooms,** (2013, U of Calgary, Canada)
- **Introduction to CMG's Modelling Workflows,** (2014, CMG company, Canada)
- **Introduction to Thermal EOR Simulation**, (2015, CMG company, Canada)
- **SAGD Simulation Using STARS,** (2015, CMG company, Canada)

Teaching experience:

- Transport Phenomena in Porous Media
- Process Equipment Design
- Computational Fluid Dynamics
- Advanced Numerical Analysis
- Advanced Mathematics Applications in Chemical Engineering
- Calculations of Refining Engineering
- Petroleum Refining Processes
- Fluid Mechanics
- Thermodynamics
- Unit operation
- Mass transfer

Work and Professional Experiences:

1- Associate Professor **since April 2022**
Faculty of Chemical and Petroleum Engineering, University of Tabriz, Iran

2- Assistant Professor **June 2017-April 2022**
Faculty of Chemical and Petroleum Engineering, University of Tabriz, Iran

3- Software instructor **Sept 2017-Sept 2020**
Tehran Institute of Technology, Iran

4- **Lecturer** **May 2016- Aug 2016**
School of Engineering, University of California, Merced, USA

5- **Postdoctoral Fellow** **May 2015- Sep 2016**
Water and Energy Laboratory, SE, University of California, Merced, USA

6- **Postdoctoral Fellow** **Aug 2013- May 2015**
Reservoir Simulation Group, CCIT, University of Calgary, Canada

7- **Graduate Research Assistant** **July 2009- June2013**
Multiphase Flow Simulation Laboratory, University of British Columbia, Canada

8- **Graduate Teaching Assistant** **July 2009- June 2013**
Chemical & Biological Engineering Department, University of British Columbia, Canada

9- **Faculty member as a Full Time Lecturer** **Sep 2006- July 2009**
Mechanical Engineering Department, Sahand University of Technology, Iran

Research interests:

- Transport phenomena
- Energy storage
- Renewable Energy
- Nanofluids application
- Simulation & modeling

Membership:

- Member of Iran National Elites Foundation (عضو بنیاد ملی نخبگان)
- American Physical Society - Division of Fluid dynamics (APS-DFD),
- Iranian Chemical Engineering Society,

Reviewer/Referee for Journals:

- Physical Review E,
- Langmuir,
- Journal of Petroleum Science & Engineering,
- Journal of Thermal Science and Engineering Applications,
- International Journal of Refrigeration,
- International Journal of Heat and Mass Transfer,
- Ain Shams Engineering Journal,
- Journal of Porous Media,
- Entropy,
- Arabian Journal of Science and Engineering,
- Microsystem Technologies,
- AUT Journal of Mechanical Engineering,
- Journal of Energy Management and Technology (JEMT),
- Journal of Mechanical Engineering University of Tabriz (JMEU),
- Iranian Journal of Chemistry and Chemical Engineering, …

Journal papers (published):

1- "A Dual Neural Network Approach with PID Control and Reference Tracking to Enhance Oil Recovery", ***Advanced Theory and Simulations, (2025),*** 2401168.

2- "Modeling and enhanced biodiesel production using a sustainable green catalyst based on palm frond-activated carbon supported with zirconium oxide", ***Fuel, (2026),*** 403,136118.

3- “Computational exploration of injection strategies for improving medicine distribution in the liver”, ***Computers in Biology and Medicine, (2025),*** 185, 109585.

4- “Revolutionizing biodiesel with novel MWCNT-COOH@TiO2-ZnO nanocatalysts for enhanced transesterification and tribocorrosion resistance”, ***Renewable Energy, (2025),*** 240, 122288.

5- “Enhancing biodiesel production and tribocorrosion resistance with MWCNT–COOH @TiO2 nanocatalysts”, ***Fuel, (2025),*** 385, 133811.

6- “Advanced MWCNT-COOH@ZnO Nano Catalyst for Biodiesel Production from Used Cooking Oil Enhancing Fuel Quality and Reducing Engine Wear”, ***Iranian J. Chem. Chem. Eng., (2025),*** 44, 07.

7- “Optimization of Waste Valorized Biodiesel Production Using Box-Behnken Design and Sustainable Calcium Oxide Catalysts”, ***Iranian J. Chem. Chem. Eng., (2025),*** 44, 07.

8- “Sustainable water production study from simulation humid air by condensation unit”, ***Desalination and Water Treatment, (2024),*** 320, 100885.

9- “Effects of nanoparticles concentration and steam flowrate on oil recovery from a model porous medium”, ***Chemical Engineering & Technology*****, (2024),** DOI: 10.1002/ceat.202300044.

10- “Injection of polyacrylamide and polyethylene glycol solutions to assess enhanced oil recovery and drawbacks of the polymer injection”, ***Geoenergy Science and Engineering*****, (2024)** 213074.

11- “A Novel Process for Styrene Monomer Production with CO2 Utilization and Membrane Process”, ***Arabian Journal for Science and Engineering*****, (2024)**, DOI: 10.1007/s13369-024-09059-6.

12- “Evaluating the impact of urban multifunctional walls on pedestrian wind comfort on street sidewalks (Case study: Tabriz City)”, ***Wind and Structures (2024),*** 39 (3), pages 223-242.

13- “Effects of transient consecutive cyclic injection-suction of a fluid on the interfacial dynamics during a radial immiscible fluid-fluid displacement inside a Hele-Shaw cell”, ***Iranian J. Chem. Chem. Eng., (IJCCE)*** **(2024),** Vol. 43, No. 8.

14- “Impact of cationic surfactant-coated hydrophilic nanoparticles on polymeric solution performance in chemical enhanced oil recovery (CEOR) from a two-dimensional porous medium”, ***Chemical Engineering Research and Design,*** **(2024),** DOI: 10.1016/j.cherd.2024.03.003.

15- “Effect of Temperature on Enhanced Oil Recovery from a Two-Dimensional Porous Medium when Injecting Polyacrylamide Polymer Solution”, ***Iranian Chemical Engineering Journal***, 22, 130 (**2024**), 118-128.

16- “Simulation of flared gases combustion inside a double-wall thermal chimney using computational fluid dynamics”, ***Iranian J. Chem. Chem. Eng. (IJCCE)*** (**2023**), DOI: 10.30492/IJCCE.2023.2011475.6218.

17- “Evaluation of Thermal Stability of TiO2 Applied on the Surface of a Ceramic Tile to Eliminate Methylene Blue Using Silica-based Doping Materials”, ***Advanced Journal of Chemistry-Section A***, 6(4), (**2023**), 352-365.

18- “Effects of temperature and nanofluid type on the oil recovery from a vertical porous media in antigravity fluid injection”, ***Chemical Engineering Research and Design,*** **(2023),** DOI:10.1016/j.cherd.2023.03.046.

19- "Experimental study of thermal stability of TiO_2 in presence of dopants and silica as a catalyst support at high temperatures", ***Nashrieh Shimi va Mohandesi Shimi Iran***, 42 (2), (**2023**), 133-143.

20- “A Precise Mathematical Correlation to Estimate Product Yield of Delayed Coking Units”, ***Journal of Chemical and Petroleum Engineering***, 57(1), (**2023**), 189- 202.

21- "Effects of heat–light source on the thermal efficiency of flat plate solar collector when nanofluid is used as service fluid", ***Journal of Thermal Analysis and Calorimetry***, (**2023**), DOI: 10.1007/s10973-023-12181-6

22- "Thermal efficiency of flat plate solar collector with TiO2-based nanofluid: synergistic effect of size and facet orientation", ***Physica Scripta***, 98 (**2023**) 045915.

23- "Effects of hot nanofluid injection on oil recovery from a model porous medium", ***Chemical Engineering Research and Design*** 186 (**2022**) 451–461.

24- "Experimental study on cylindrical and flat plate solar collectors' thermal efficiency comparison" ***Renewable Energy*** 190 (**2022**) 848-864.

25- "Epoxy resin matrix integrating epoxy-polydimethylsiloxane based self-healing microcapsules: Healing efficiency, mechanical and thermal stability", ***Polymer Engineering and Science,*** 62 (7) (**2022**) 2302-2311.

26- "Left atrial appendage shape impacts on the left atrial flow hemodynamics: A numerical hypothesis generating study on two cases", ***Computer Methods and Programs in Biomedicine,*** 213 (**2022**) 106506.

27- "Excellent electromagnetic wave absorption by complex systems through hybrid polymerized material" Polymer Bulletin, ***Polymer Bulletin,*** 79 (**2022**) 955-970.

28- "Experimental Study on Viscose Fingering Instability in Radial Displacing of Carboxymethyl Cellulose Solution by Paraffin in Hele-Shaw Cell", ***Journal of the Taiwan Institute of Chemical Engineers,*** 127 (**2021**) 46-55.

29- "Capabilities of α-Al_2O_3, γ-Al_2O_3, and bentonite dry powders used in flat plate solar collector for thermal energy storage***", Renewable Energy*** 173 (**2021**) 704-720.

30- "Effects of phase change on enhanced oil recovery during injection of steam carrying alumina nanoparticles: Numerical simulation", ***Arabian Journal for Science and Engineering***, (**2021**) doi.org/10.1007/s13369-021-05738-w.

31- "Towards convective heat transfer optimization in aluminum tube automotive radiators: Potential assessment of novel Fe_2O_3-TiO_2/water hybrid nanofluid", ***Journal of the Taiwan Institute of Chemical Engineers,*** 124 (**2021**) 424-436.

32- "Effects of the wettability gradient of the flow structure inside a sessile droplet carrying a hydrophobic microparticle on solid substrate", ***Nashrieh Shimi va Mohandesi Shimi Iran, (*2021*).***

33- "Nanoparticles enhanced phase change materials (NePCMs)-A recent review", **Applied Thermal Engineering,** 176 (**2020**) 115305.

34- "Compatibilization of immiscible polymer blends (R-PET/PP) by adding PP-g-MA as compatibilizer: analysis of phase morphology and mechanical properties", ***Polymer Bulletin,*** 77 (**2020**) 5753-5766.

35- "Effects of utilizing nanofluid as working fluid in a lab-scale designed FPSC to improve thermal absorption and efficiency", ***Physica A Journal,*** 540 (**2020**) 123109.

36- "Effect of Wetting and Dewetting on the Dynamics of Atomic Force Microscopy Measurements", ***Langmuir***, 35 (41) (**2019**) 13301-13310.

37- "Application of Lab-Scale MBBR to Treat Industrial Wastewater using K3 Carriers: Effects of HRT, High COD Influent, and Temperature", ***International Journal of Environmental Sciences & Natural Resources***, 2 (2) (**2019**) 556031.

38- “Application of phosphorescent material in activation of N:Cu:TiO_2 photocatalyst as antibacterial and dye removal agent from solid surfaces used in hospitals”, ***Journal of Environmental Chemical Engineering***, 7 (**2019**) 102956.

39- “Application of oak powder/Fe3O4 magnetic composite in toxic metals removal from aqueous solutions” ***Advanced Powder Technology,*** 30 (**2019**) 544–554.

40- “Condensate Retention as a function of condensate flow rate on horizontal enhanced PIN-FIN Tubes”, ***Thermal Science,*** 23 (**2019**) 3887-3892.

41- "Studying the physicochemical characteristics and metals adsorptive behavior of CMC-g-HAp/Fe3O4 nanobiocomposite", ***Journal of Environmental Chemical Engineering***, 6 (**2018**) 6049–6058

42- “Six stages of microdroplet detachment from microscaled fibres", ***Langmuir,*** 34 (1) (**2018**) 198-204.

43- "An experimental study of enhanced heat sinks for thermal management using n-eicosane as phase change material", ***Applied Thermal Engineering***, (**2018**) 132, 52–66.

44- "Coalescence of sessile microdroplets subject to a wettability gradient on a solid surface”, ***Physical Review E***, 94 (**2016**) 033112.

45- “Dynamics of liquid bridges inside microchannels subject to external pulsatile flow ", ***European Journal of Mechanics B/Fluids***, 57 (**2016**) 129–142.

46- “Immiscible flow displacements with phase change in radial injection “, ***International Journal of Multiphase flows,*** 72 (**2015**) 73-82.

47- “Dynamics of viscous liquid bridges inside microchannels subject to external oscillatory flow “, ***Physical Review E,*** 91 (**2015**) 023002.

48- “Motion and coalescence of sessile drops driven by substrate wetting gradient and external flow”, ***Journal of Fluid Mechanics***, 746 (**2014**) 214- 235.

49- “Relative permeability for two-phase flow through corrugated tubes as model porous media”, ***International Journal of Multiphase flows,*** 47 (**2012**) 85-93.

50- “Interfacial flows in corrugated micro-channels: flow regimes, transitions and hysteresis”, ***International Journal of Multiphase flows***, 37 (**2011**) 1266-1276.

51- "CFD approach for the moisture prediction in spray chamber for drying of salt solution", ***Journal of Industrial and Engineering Chemistry***, 17 (3) (**2011**) 527-532.

52- "Effect of coronary-coronary bypass geometrical configuration on blood flow parameters in end-to-side and side-to-end anastomoses regions", ***Iranian J. Chem. Chem. Eng. (IJCCE)***, 3 (29) (**2010**) 101-109.

53- "Simulation of three-dimensional pulsatile blood flow in aorta-coronary bypass", ***Iranian Journal of Biomedical Engineering***, 4 (1) (**2010**) 65-72.

54- "A Numerical Study of Pulmonary Gas Exchange System to Assess a Proper Relationship between Respiration Rhythm and Individual's Activity Rate", ***Iranian Journal of Biomedical Engineering***, 2 (1) (**2008**) 39-46.

55- "Blood flow simulation and comparing of hemodynamic factors in aorta-coronary and coronary-coronary bypasses", ***Iranian Journal of Biomedical Engineering,*** 1 (2) (**2007**) 111-118.

56- “Design, make and startup of a multipurpose absorbing packed bed tower in laboratory scale", ***Iranian Journal of Chemical Engineering***, 24 (**2006**) 75-81.

Selected conference papers:

1- "Dynamics of liquid bridges inside microchannels subject to pure oscillatory flows", 67th annual APS-DFD meeting, San Francisco, CA, USA, Nov. 2014.

2- “Phase Change Effects on Immiscible Flow Displacements in Radial Injection", 67th annual APS-DFD meeting, San Francisco, CA, USA, Nov. 2014.

3- "Motion and coalescence of sessile drops driven by substrate wetting gradient and external flow", 65th annual APS-DFD meeting, San Diego, CA, USA, Nov. 2012.

4- “Interfacial flows in micro-channels: Flow regimes, transitions & hysteresis”, ICIAM, Vancouver, BC. July, 2011.

5- “Interfacial flows in micro-channels”, CANCAM, Vancouver, BC. June, 2011.

6- “Interfacial flows in micro-channels: Flow regimes, transitions”, 63rd annual APS-DFD meeting, Long beach, CA, USA, Nov. 2010.

7- "A numerical study to assess a proper relationship between respiration rhythm and athletes activities ", Paper Code: BM-104, 4th Cairo International Biomedical Engineering Conference 2008 (CIBEC'08).

8- "CFD simulation and PIV measurement of dual rushton impeller stirred tank reactor", ACOMEN 2008, Liège, Belgium, May 2008.

9- "Design and fluid flow analysis of helix heat exchangers", Paper code: 01211, pp. 366-374, The 5th International Chem. Eng. Congress (IChEC 2008), Kish Island, Iran, Jan. 2008.

10- "CFD simulation of power and mixing time for rushton turbine in a baffled-tank reactor", Paper code: 01182, pp. 292-301, The 5th International Chem. Eng. Congress (IChEC 2008), Kish Island, Iran, Jan. 2008.

11- **"**Effects of nozzle diameter, flow rates and jet angel on mixing time in a jet mixer", Paper code: 01224, pp. 433-442, The 5th International Chem. Eng. Congress (IChEC 2008), Kish Island, Iran, Jan. 2008.

12- "The study of oxygen diffusivity effects on oxygen uptake in pulmonary capillaries", Paper Code: ICBME0062, ICBME2008, Mashhad, Iran, Dec. 2008.

13- "Simulation of Blood Treatment Flow in Artificial Kidney", Paper Code: ICBME0062, ICBME2008, Mashhad, Iran, Dec. 2008.

14- "Effects of the stenos percent and graft angle on the temporal shear stress gradients in the aorto-coronary bypass", Paper code: 01183, Abstract pp. 37, IChEC11, Tehran - Iran, Nov. 2006.

15- “Effects of variable stenos percents and bypass graft angles on the temporal shear stress gradients in the aorto-coronary bypass”, Paper code: CF14_586, pp. 7113 – 7128, IChEC10, Zahedan - Iran, Dec. 2005.

16- "Effects of different stenos percents and graft angles on blood flow field in coronary – coronary bypass", Paper code: TP116, pp. 33 - 44, IChEC9, Tehran - Iran, Nov. 2004.

17- “Simulation of three dimensional pulsatile blood flow in aorta-coronary bypass”, Paper code: 305, ICBME 2004, pp. 72, Tehran - Iran, Feb. 2004.

18- “Comparing of aorta-coronary bypass and coronary-coronary bypass blood flow fields”, Paper code: 315, ICBME 2004, pp. 73, Tehran –Iran, Feb. 2004.

References:

References are available upon request.