Mohammad Fakhroleslam

PERSONAL INFORMATION

Mohammad Fakhroleslam
Assistant Professor
Chemical Engineering Department
Tarbiat Modares University

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Tarbiat Modares University, Tehran, Iran.
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RESEARCH INTERESTS

- Simulation, Optimization, and Control of Process Systems
- Hybrid systems
- Value chain management in oil, gas, and petrochemicals industries
- Application of Artificial Intelligence in chemical engineering

EDUCATION

2012-2017	Ph.D. in Chemical Engineering

School of Chemical Engineering, Faculty of Engineering
University of Tehran, Tehran, Iran
GPA: 19.13/20, Thesis: *Excellent*
Supervisors: Prof. Shohreh Fatemi (Email: shfatemi@ut.ac.ir)
   Prof. Ramin B. Boozarjomehry (Email: rbozorgmehry@sharif.edu)

Thesis: Hybrid Modeling Framework for Simulation and Control of Pressure Swing Adsorption Processes

Oct 2016-Feb 2017, Visiting Ph.D. Student
DISIM, DEWS Center of Excellence,
University of L'Aquila, L'Aquila, Italy
Supervisors: Prof. Maria D. Di Benedetto (Email: mariadomenica.dibenedetto@univaq.it)
   Dr. Elena De Santis, Dr. Giordano Pola
Project: Design of a Hybrid Controller for Pressure Swing Adsorption Processes

2010-2012   M.Sc. in Process Modeling, Simulation and Control
Chemical and Petroleum Engineering Department
Sharif University of Technology, Tehran, Iran
GPA: 18.23/20
Supervisor: Prof. Ramin B. Boozarjomehry (Email: rbozorgmehry@sharif.edu)

Thesis: High Order Approximate Linearization to Control Glucose Level in Patients with Type I Diabetes

2006-2010   B.Sc. in Chemical Engineering
Chemical and Petroleum Engineering Department
Sharif University of Technology, Tehran, Iran
GPA: 16.88/20, ChE GPA: 17.23/20
Supervisor: Prof. Mohammad Kazemeini (Email: kazemeini@sharif.edu)

Thesis: Technical and economical design for a semi-industrial production unit of palladium nanoparticles on carbon nanotubes

PUBLICATIONS

- **M. Fakhroleslam**, S.M. Sadrameli, "Thermal cracking of hydrocarbons for the production of light olefins; A review on optimal process design, operation, and control", *I&EC Research* 59 (**2020**) 12288–12303.
- **M. Fakhroleslam**, G. Pola, E. De Santis, M.D. Di Benedetto, "Time-optimal symbolic control of a changeover process based on an approximately bisimilar symbolic model", *Journal of Process Control* 81 (**2019**) 126-135.
- **M. Fakhroleslam**, S.M. Sadrameli, "Thermal/Catalytic cracking of hydrocarbons for the production of olefins; A state-of-the-art review III: process modeling and simulation", *Fuel* 252C (**2019**) 553-566.
- **M. Fakhroleslam**, R.B. Boozarjomehry, S. Fatemi, E. De Santis, M.D. Di Benedetto, G. Pola. "Design of A Hybrid Controller for Pressure Swing Adsorption Processes", *IEEE Trans. Control Systems Technology* 27 (**2019**) 1878-1892.
- **M. Fakhroleslam**, S. Fatemi, R.B. Boozarjomehry, E. De Santis, M.D. Di Benedetto, G. Pola. "Maximal safe set computation for pressure swing adsorption processes", *Computers and Chemical Engineering* 109 (**2018**) 179-190.
- F. Pazhooh, F. Shahraki, J. Sadeghi, **M. Fakhroleslam**, "Multivariable Adaptive Neural Network Predictive Controller in Plantwide Control of Vinyl Acetate Monomer Process in the Presence of Measurement Time-Delay", *Journal of Process Control* 66 (**2018**) 39 50.
- **M. Fakhroleslam**, R.B. Boozarjomehry, S. Fatemi. "Design of a dynamical hybrid observer for pressure swing adsorption processes", *International Journal of Hydrogen Energy* 42 (**2017**) 21027-21039.
- **M. Fakhroleslam**, S. Fatemi, R.B. Boozarjomehry. "A switching decentralized and distributed extended Kalman filter for pressure swing adsorption processes", *International Journal of Hydrogen Energy* 41 (**2016**) 23042-23056.
- **M. Fakhroleslam**, S. Fatemi. "Comparative simulation study of PSA, VSA, and TSA processes for purification of methane from CO_2 via SAPO-34 core-shell adsorbent", *Separation Science and Technology* 51 (**2016**) 2326-2338.
- **M. Fakhroleslam**, R.B. Boozarjomehry, F. Pazhooh. "Nonlinearity assessment of chemical processes", *Scientia Iranica. Trans. C, Chemistry, Chemical Engineering* 22 (**2015**) 967-980.
- **M. Fakhroleslam**, A. Samimi, S.A. Mousavi, R. Rezaei, "Prediction of the effect of polymer membrane composition in a dry air humidification process via neural network modeling", *Iranian Journal of Chemical Engineering,* 13 (**2016**) 73-83.

PRESENTATIONS (Selected)

- M. Fakhroleslam, "PSE for the Design of Hydrogen Supply Chains", A workshop at NRI, the research organization of Iran's Ministry of Energy, Dec. 2019.
- M. Fakhroleslam, S. Fatemi, R.B. Boozarjomehry, E. De Santis, M.D. Di Benedetto, G. Pola. "An event-driven controller for pressure swing adsorption processes", 56th IEEE CDC, Melbourne, Australia, Dec. 2017.
- P. Palumbo, M. Ghasemi, M. Fakhroleslam. "On enzymatic reactions: the role of a feedback from the substrate", 56th IEEE CDC, Melbourne, Australia, Dec. 2017.
- M. Fakhroleslam, R.B. Boozarjomehry, S. Fatemi, Gabriella Fiore. "Dynamical Hybrid Observer for Pressure Swing Adsorption Processes", 20th IFAC WC, Toulouse, France, Jul. 2017.
- M. Ghasemi, M. Fakhroleslam, S. Fatemi, R.B. Boozarjomehry. "Optimal chemotherapy for treatment of tumors in the presence of biological constraints", 9th Int. Chemical Engineering Congress, Shiraz, Iran, Dec. 2015.
- M. Fakhroleslam, S. Fatemi, "Optimization Studies on Hydroisomerization and Hydrocracking of Long Chain n-Paraffins in Tubular Fixed-Bed Reactors", 15th Iranian Chemical Engineering Congress, Tehran, Iran, Feb. 2015.

TEACHING EXPERIENCES

- Lecturer: *Computer-Aided Process Design*, Department of Chemical Engineering, Tarbiat Modares University, Spring 2019, Spring 2020.
- Lecturer: *Modeling and Simulation of Chemical Processes*, Department of Chemical Engineering, Tarbiat Modares University, Autumn 2018, Spring 2020.
- Lecturer: *Advanced Numerical Methods*, Department of Chemical Engineering, Tarbiat Modares University, Spring 2019, Autumn 2019.
- Lecturer: *Applications of Artificial Intelligence in Chemical Engineering*, School of Chemical Engineering, University of Tehran, Spring 2018.
- Lecturer: *Introduction to MatLab and Its Applications*, School of Chemical Engineering, University of Tehran, Spring 2015.
- Lecturer: *Applications of Artificial Intelligence in Chemical Engineering* (Fuzzy Logic, Neural Networks, Heuristic Optimization Methods), School of Chemical Engineering, University of Tehran, Spring 2013.

HONORS, AWARDS, AND GRANTS

- "Dr. Kazemi Ashtiani" Starting Grant Award for Young Professors, Iran's National Elite Foundation, 2019.
- Visiting Professor Grant Award, University of L'Aquila, Italy, 2018.
- Ranked **1st** among Ph.D. students in the School of Chemical Engineering, University of Tehran, 2017.
- Visiting student abroad scholarship, International affairs, University of Tehran, 2016.
- Identified as an Exceptional Talent by Iran's National Elites Foundation, 2016.
- NIGC (National Iranian Gas Company) research grant for Ph.D. students, 2016.
- Selected as Top Graduated student in Chemical Engineering by Iranian Association of Chemical Engineering (IAChE), 2013.
- Ranked **4th** among 1515 participants in the nationwide entrance exam for Ph.D. degree in chemical engineering, 2012.
- Ranked **1st** among M.Sc. students of Process Simulation and Control, Chemical and Petroleum Engineering Department, Sharif University of Technology, 2012.
- Ranked **15th** in the 15th Iranian National Chemical Engineering Olympiad, 2010.
- Identified as an Exceptional Talent in Sharif University of Technology, 2010
- Ranked **5th** among 7252 participants in the nationwide entrance exam for M.Sc. degree in chemical engineering, 2010.
- Ranked among top 0.5% of about 300,000 participants in the nationwide entrance exam of B.Sc. degree, 2006.

CERTIFICATES

- Master of Business Administration (MBA) program, College of Engineering, University of Tehran, 2017.
- *Various Options for Safe, Secure and Cost-Effective Export of Liquid Products*, Organized by IMPaC Offshore Engineering GMBH, Simorgh Hotel, Tehran, 2017.
- *Managing Corrosion in Oil & Gas Industry*, Organized by TOTAL Company, Ranked **1st** in the exam, 2010.
- *Reduction of CO_2 Emissions by Capture and Storage*, Organized by TOTAL Company, Ranked **1st** in the exam, 2010.

WORK EXPERIENCE

- **Tarbiat Modares University**
  Assistant Professor, Chemical Engineering Department, Since Sep. 2018.

- **University of L'Aquila, Italy**
  Visiting Professor, Department of Information Engineering, Computer Science and Mathematics, Spring 2018.

- **Abdiz Sahra Engineering Co.**
  Design of Automation Philosophy and Control Logics for an Ion-Exchange Package for water demineralization in Sarcheshmeh Copper Complex, Sep 2019-Feb 2020 (Industrial Project)

- **Behta Industrial Group**
  Flow Assurance and dynamic analysis of a sour gas transmission pipeline, Sep 2019-Dec 2019 (Industrial Project)

- **University of Tehran**
  Researcher, head of modeling and control section, Sep 2017-Mar 2018 (Part time)
  - Technical and economic feasibility study, and construction of a Residue Fluid Catalytic Cracking (RFCC) pilot plant, a FS project.

- **Mokran Gas Transmission Pipeline Co.**
  Process and Instrument Engineer, Sep 2013-Apr 2018 (Part time)
  - Asalouyeh-Chabahar Ethane Dense Phase Transmission Pipeline
  - Chabahar harbor tanks and terminals of Mokran Petrochemical Complex

- **Bina Consulting Engineers Co.**
  Process Designer, Jan 2013-Mar 2014 (Industrial Project)
  - Golgohar natural gas transmission pipeline
  - Gavarzin-Bandarabbas natural gas transmission pipeline:

- **National Iranian Gas Company (NIGC)**
  Process Engineer, Jan-Mar 2013 (Industrial Project)
  - Depressurization simulation study for the 56" IGAT VII high pressure natural gas pipeline.

- **Center for Membrane Technology**, Sharif University of Technology
  Process Engineer, Nov 2011-Oct 2012 (Part time)

- **Research Institute of Petroleum Industry (RIPI)**
  Industrial internship: during 360 hours, summer 2010. Supervisors: M. Talaei and T. Feizi.

COMPUTER AND PROGRAMMING SKILLS

- Aspen HYSYS (Static and Dynamic), Aspen PLUS, Aspen Dynamics, Aspen Adsorption
- MATLAB (Expert in: Programming and Simulation, Simulink, Identification, Stateflow, Optimization, Fuzzy Logic, Neural Networks)
- OLGA
- ANSYS (Fluent, AutoDyn), COMSOL

- ProMax and PRO2
- MiniTab
- AutoCAD
- Microsoft Office (Excel+VB, Word, PowerPoint)
- COREL Draw Graphics
- Programming: familiar with FORTRAN, C++, PASCAL, VB