

Davood B. Pourkargar

Associate Professor, Tim Taylor Department of Chemical Engineering
Warren and Gisela Kennedy Keystone Research Scholar
Kansas State University, Manhattan, KS, Email: dbpourkargar@ksu.edu
<https://che.k-state.edu/about/people/faculty/pourkargar/>
<https://scholar.google.com/citations?user=1lhogOcAAAAJ&hl=en>

APPOINTMENTS

Associate Professor (with Tenure), Tim Taylor Department of Chemical Engineering, Kansas State University, Manhattan, KS, 2026 – Present

Assistant Professor, Tim Taylor Department of Chemical Engineering, Kansas State University, Manhattan, KS, 2020 – 2026

Faculty Researcher, Johnson Cancer Research Center, Kansas State University, Manhattan, KS, 2022 – Present

Graduate Faculty, Food Science Institute, Kansas State University, Manhattan, KS, 2023 – 2026

Visiting Assistant Professor, Terasaki Institute for Biomedical Innovation, Los Angeles, CA, 2024 – 2026

Senior Engineer, ExxonMobil Research and Engineering, Spring, TX, 2019 – 2020

Postdoctoral Associate, Department of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, 2016 – 2019

Postdoctoral Researcher, Catalysis Center for Energy Innovation (CCEI), Department of Energy EFRC, University of Delaware, Newark, DE, 2015 – 2016

EDUCATION

Ph.D. in Chemical Engineering, Pennsylvania State University, University Park, 2015

M.S. in Process Simulation and Control, Sharif University of Technology, 2010

B.S. in Chemical Engineering, Sharif University of Technology, 2008

SELECTED ACHIEVEMENTS AND AWARDS

- NSF CAREER Award, 2026
- Warren and Gisela Kennedy Keystone Research Scholar, Carl R. Ice College of Engineering, Kansas State University, 2025-2030
- Carl R. Ice College of Engineering Outstanding Assistant Professor Award, Kansas State University, 2024
- Keynote Speaker, Cybersecurity and High-Performance Computing, AIChE Next-Gen Manufacturing Topical Conference, 2024
- National Science Foundation EPSCoR Research Fellowship, 2024-2027
- Big XII Faculty Fellowship, Kansas State University, 2023
- Air Force Office of Scientific Research (AFOSR) Summer Faculty Fellowship, 2023
- Kansas EPSCoR First Award, 2023
- Best Presentation in the Session Award, AIChE Annual Meeting, 2017
- Robert F. Smith Distinguished Junior Researcher Award, Cornell University, 2017
- Institute for Mathematics and its Application (IMA) Visiting Fellowship, University of Minnesota, 2016
- AIChE Computing and Systems Technology (CAST) Director's Student Presentation Finalist and Travel Award, 2015
- O. Hugo Schuck Best Paper Award, American Automatic Control Council (AACC), 2014
- Best Presentation Awards in American Control Conferences, 2013 & 2015
- Walter R. and Aura Lee Supina Graduate Fellowship, Pennsylvania State University, 2011

AWARDED GRANTS

1. CAREER: Digital intelligence architecture for efficient and secure operation of integrated polygeneration systems, National Science Foundation, Division of Chemical, Bioengineering, Environmental, and Transport Systems (CBET), Award Number: 2543146, 07/01/2026 - 06/30/2031, \$524,960 (**Sole PI**)
https://www.nsf.gov/awardsearch/show-award?AWD_ID=2543146

Davood B. Pourkargar

Associate Professor, Tim Taylor Department of Chemical Engineering
Warren and Gisela Kennedy Keystone Research Scholar
Kansas State University, Manhattan, KS, Email: dbpourkargar@ksu.edu
<https://che.k-state.edu/about/people/faculty/pourkargar/>
<https://scholar.google.com/citations?user=1lhogOcAAAAJ&hl=en>

2. Physics-informed learning-based synthesis of functional chemical products for renewable energy applications, National Science Foundation, Division of Chemical, Bioengineering, Environmental, and Transport Systems (CBET), Award Number: 2414683, 12/01/2024 - 11/30/2027, \$578,793 (**Lead PI**)
https://www.nsf.gov/awardsearch/show-award?AWD_ID=2414683
3. Physics-informed machine learning with organ-on-a-chip data for an in-depth understanding of disease progression and drug delivery dynamics, National Science Foundation, Office of Integrative Activities (OIA), Award Number: 2327473, 02/01/2024 - 01/31/2027, \$245,403 (**Sole PI**)
https://www.nsf.gov/awardsearch/show-award?AWD_ID=2327473
4. A physics-informed machine learning-based predictive modeling framework to enhance efficiency, sustainability, and resilience for global food systems, Global Food Systems Seed Grant, Kansas State University, 07/01/2024 – 06/30/2026, \$199,739 (**Lead PI**)
5. Biomanufacturing innovation lab for sustainable, safe, and secure bioeconomy, Biomanufacturing Initiative, Kansas State University, 11/15/2023 - 06/30/2024, \$320,000 (**Lead PI**)
6. Distributed green ammonia generation for resilient energy storage and fertilizer production in rural communities, Kansas NSF EPSCoR, 04/01/2023 - 03/31/2024, \$71,221 (**Sole PI**)
7. Sustainable and smart processing for delivering health and nutrition, Game-Changing Research Initiative Program, Kansas State University, 09/01/2023 - 06/30/2024, \$100,000 (**co-PI**), my share: \$25,000
8. Nanoscale materials for improved energy storage and conversion, food security and safety, and environmental sustainability, Game-Changing Research Initiative Program, Kansas State University, 09/01/2023 - 06/30/2024, \$100,000 (**co-PI**), my share: \$25,000
9. Physics-informed machine learning modeling of opioid pharmacokinetics in a liver cancer microphysiological system for precision pain management, Johnson Cancer Research Center, Kansas State University, 06/01/2026 - 09/30/2026, \$7,500 (**Sole PI**)
10. Multiscale modeling of tumor drug transport and bioreactivity: A high-fidelity framework for Chemotherapy Optimization, Johnson Cancer Research Center, Kansas State University, 05/01/2025 - 07/31/2025, \$7,500 (**Sole PI**)
11. Johnson Cancer Research Fall Stipend Award, Kansas State University, 12/01/2023 - 05/15/2024, \$1,500 (**Sole PI**)
12. Big 12 Faculty Fellowship, Kansas State University, 06/27/2023 - 09/01/2024, \$1,763 (**Sole PI**)
13. Development of resilient urban food systems that ensure food security in the face of climate change, Game-Changing Research Initiative Program, Kansas State University, 09/01/2023 - 06/30/2024 (**co-PI**), my share: \$4,500
14. Faculty Startup Grant, Tim Taylor Department of Chemical Engineering, Kansas State University, 08/01/2020 - 07/31/2024, \$400,000 (**Sole PI**)

PEER-REVIEWED PUBLICATIONS

Book Chapters:

1. Bagheri A., Cabral T.O., Sheikhezadeh S., Alavi S., Pourkargar D.B., Learning-based digital twin for quality control in food manufacturing: A case study in extrusion-based plant protein texturization, *Digital Twins in Manufacturing: Applications and Case Studies* (Edited by Soroush M. and Braatz R.), 2026 (**Accepted for Publication**)

Journal Papers:

2. Bagheri A., Ebrahimi A., **Pourkargar D.B.**, Distributed transformer architectures for cyberattack detection and resilient recovery in integrated process networks, *AIChE Journal*, 2026 (**Under Review**)
3. Cabral T.O., **Pourkargar D.B.**, Resilient moving horizon dynamic optimization of integrated chemical-energy communities under supply chain disruptions, *Computers and Chemical Engineering*, 2026 (**Under Review**)

Davood B. Pourkargar

Associate Professor, Tim Taylor Department of Chemical Engineering

Warren and Gisela Kennedy Keystone Research Scholar

Kansas State University, Manhattan, KS, Email: dbpourkargar@ksu.edu

<https://che.k-state.edu/about/people/faculty/pourkargar/>

<https://scholar.google.com/citations?user=1lhogOcAAAAJ&hl=en>

4. Bagheri A., Sheikhezadeh S., Alavi S., **Pourkargar D.B.**, An integrated vision-guided deep learning framework for quantitative structural quality assessment in plant-based meat extrusion processes, *Engineering Applications of Artificial Intelligence*, 2026 (**Under Review**)
5. Ighalo J.O., Ebrahimi A., Smith M., He X., Li G., **Pourkargar D.B.**, Amama P.B., Ni exsolution dynamics in NiCr_2O_4 spinels for high-performance dry reforming of methane, *Applied Catalysis B: Environment and Energy*, 2026 (**Under Review**)
6. Bagheri A., Albright C., Ghanbarian B., **Pourkargar D.B.**, A distributed physics-guided time series learning architecture for spatially consistent soil water content prediction, *Computers and Electronics in Agriculture*, 2026 (**Under Review**)
7. Cabral T.O., Ebrahimi A., Bagheri A., Khorsandi D., Dokmeci M., Jucaud V., **Pourkargar D.B.**, A digital twin framework for predictive modeling of liver-on-a-chip system dynamics with limited experimental data, *Chemical Engineering Journal*, 2026; 539: 177046 <https://doi.org/10.1016/j.cej.2026.177046>
8. Ebrahimi A., Bagheri A., Cabral T.O., Ighalo J.O., Amama P.B., **Pourkargar D.B.**, A microkinetic-informed learning framework for predictive modeling of catalytic dry reforming with limited experimental data, *Chemical Engineering Science*, 2026; 332:124062 <https://doi.org/10.1016/j.ces.2026.124062>
9. Bagheri A., Sheikhezadeh S., Alavi S., **Pourkargar D.B.**, An integrated time series modeling and computer vision framework for predictive structure characterization of extruded plant-based meat products, *Artificial Intelligence in Agriculture*, 2026; 16(2):854-872 <https://doi.org/10.1016/j.aiia.2026.03.010>
10. Ebrahimi A., **Pourkargar D.B.**, Dynamic graph-based adaptive distributed estimation and control of integrated chemical process systems undergoing operational transitions, *Industrial and Engineering Chemistry Research*, 2026; 65(8):4510-4522 <https://doi.org/10.1021/acs.iecr.5c04213>
11. Cabral T.O., **Pourkargar D.B.**, Nonlinear predictive regulation of an integrated green hydrogen and ammonia production system under time-varying renewable energy supply, *Computers and Chemical Engineering*, 2026; 204:109376 <https://doi.org/10.1016/j.compchemeng.2025.109376>
12. Bagheri A., Ebrahimi A., **Pourkargar D.B.**, Self-attention transformer architectures for cyberattack detection and secure state reconstruction of integrated chemical process systems, *Chemical Engineering Research and Design*, 2025; 220:162-179 <https://doi.org/10.1016/j.cherd.2025.06.038>
13. Ighalo J.O., Ebrahimi A., Smith M., Al Mayyahi A., Almkhelfe H., **Pourkargar D.B.**, Amama P.B., Exploiting MXenes properties for coking resistance of Ni catalyst in dry reforming of methane, *Journal of Catalysis*, 2025; 450:116268 <https://doi.org/10.1016/j.jcat.2025.116268>
14. Marmolejo C.E.V., **Pourkargar D.B.**, A multiphase-multiphysics modeling framework for nonlinear predictive control of particulate polysilicon reactor systems, *Industrial and Engineering Chemistry Research*, 2025; 64(20):10163-10180 <https://doi.org/10.1021/acs.iecr.5c00551>
15. Bagheri A., Patrignani A., Ghanbarian B., **Pourkargar D.B.**, A time series-based hybrid and physics-informed machine learning framework to predict soil water content, *Engineering Applications of Artificial Intelligence*, 2025; 144:110105 <https://doi.org/10.1016/j.engappai.2025.110105>
16. Bagheri A., Cabral T.O., **Pourkargar D.B.**, Integrated learning-based estimation and nonlinear predictive control of an ammonia synthesis reactor, *AIChE Journal*, 2025; 71(5):e18732 <https://doi.org/10.1002/aic.18732>
17. Cabral T.O., Amama P.B., **Pourkargar D.B.**, Multiscale-multiphysics predictive modeling of chemical vapor deposition processes for carbon nanotube synthesis, *Chemical Engineering Science*, 2025; 305:121137 <https://doi.org/10.1016/j.ces.2024.121137>
18. Ebrahimi A., **Pourkargar D.B.**, Multi-agent distributed control of integrated process networks using an adaptive community detection approach, *Digital Chemical Engineering*, 2024; 13:100196 <https://doi.org/10.1016/j.dche.2024.100196>
19. Ebrahimi A., **Pourkargar D.B.**, An adaptive distributed architecture for multi-agent state estimation and control of complex process systems, *Chemical Engineering Research and Design*, 2024; 210:594-604 <https://doi.org/10.1016/j.cherd.2024.09.014>

Davood B. Pourkargar

Associate Professor, Tim Taylor Department of Chemical Engineering
Warren and Gisela Kennedy Keystone Research Scholar
Kansas State University, Manhattan, KS, Email: dbpourkargar@ksu.edu
<https://che.k-state.edu/about/people/faculty/pourkargar/>
<https://scholar.google.com/citations?user=1lhogOcAAAAJ&hl=en>

20. Marmolejo C.E.V., **Pourkargar D.B.**, Predictive modeling and robust nonlinear control of a polysilicon reactor system for enhanced solar cell production, *Control Engineering Practice*, 2024; 153:106065
<https://doi.org/10.1016/j.conengprac.2024.106065>
21. Cabral T.O., Bagheri A., **Pourkargar D.B.**, Learning-Based Model Reduction and Predictive Control of an Ammonia Synthesis Process, *Industrial and Engineering Chemistry Research*, 2024; 63(23):10325-10342
<https://doi.org/10.1021/acs.iecr.4c00340>
22. **Pourkargar D.B.**, Armaou A., Lyapunov-based on-line model reduction and control of semilinear dissipative distributed parameter systems with minimum feedback information, *Journal of Process Control*, 2021; 104:135-145
<https://doi.org/10.1016/j.jprocont.2021.05.011>
23. **Pourkargar D.B.**, Moharir M., Almansoori A., Daoutidis P., Distributed estimation and nonlinear model predictive control using community detection, *Industrial and Engineering Chemistry Research*, 2019; 58(30):13495-13507 (**Invited Paper**) <https://doi.org/10.1021/acs.iecr.9b00820>
24. Daoutidis P., Allman A., Khatib S., Moharir M., Palys M.J., **Pourkargar D.B.**, Tang W., Distributed decision making for intensified process systems, *Current Opinion in Chemical Engineering*, 2019; 25:75-81
<https://doi.org/10.1016/j.coche.2018.12.007>
25. Moharir M., **Pourkargar D.B.**, Almansoori A., Daoutidis P., Graph representation for distributed control of diffusion-convection-reaction system networks, *Chemical Engineering Science*, 2019; 204:128-139
<https://doi.org/10.1016/j.ces.2018.11.062>
26. **Pourkargar D.B.**, Almansoori A., Daoutidis P., Comprehensive study of decomposition effects on output tracking of an integrated process over a wide operating range, *Chemical Engineering Research and Design*, 2018; 134:553-563 (**Invited Paper**) <https://doi.org/10.1016/j.cherd.2018.04.045>
27. Moharir M., **Pourkargar D.B.**, Almansoori A., Daoutidis P., Distributed model predictive control of an amine gas sweetening plant, *Industrial and Engineering Chemistry Research*, 2018; 57:13103-13115
<https://doi.org/10.1021/acs.iecr.8b01291>
28. Tang W., **Pourkargar D.B.**, Daoutidis P., Relative time-averaged gain array (RTAGA) for distributed control-oriented network decomposition, *AIChE Journal*, 2018; 64(5):1682-1690
<https://doi.org/10.1002/aic.16130>
29. Feng J., Lansford J., Mironenko A., **Pourkargar D.B.**, Vlachos D.G., Katsoulakis M.A., Non-parametric correlative uncertainty quantification and sensitivity analysis: Application to a Langmuir biomolecular adsorption model, *AIP Advances*, 2018; 8:035021
<https://doi.org/10.1063/1.5021351>
30. Tang W., Allman A., **Pourkargar D.B.**, Daoutidis P., Optimal decomposition for distributed optimization in nonlinear model predictive control through community detection, *Computers and Chemical Engineering*, 2018; 111:43-54
<https://doi.org/10.1016/j.compchemeng.2017.12.010>
31. **Pourkargar D.B.**, Almansoori A., Daoutidis P., The impact of decomposition on distributed model predictive control: A process network case study, *Industrial and Engineering Chemistry Research*, 2017; 56(34):9606-9616
<https://doi.org/10.1021/acs.iecr.7b00644>
32. **Pourkargar D.B.**, Shahri S.M.K., Rioux R.M., Armaou A., Spatiotemporal modeling and parametric estimation of isothermal CO₂ adsorption columns, *Industrial and Engineering Chemistry Research*, 2016; 55(22):6443-6453
<https://doi.org/10.1021/acs.iecr.6b00477>
33. **Pourkargar D.B.**, Armaou A., Dynamic shaping of transport-reaction processes with a combined sliding mode controller and Luenberger-type dynamic observer design, *Chemical Engineering Science*, 2015; 138:673-684
<https://doi.org/10.1016/j.ces.2015.07.054>
34. **Pourkargar D.B.**, Armaou A., Design of APOD-based switching dynamic observers and output feedback control for a class of nonlinear distributed parameter systems, *Chemical Engineering Science*, 2015; 136:62-75 (**Invited Paper**) <https://doi.org/10.1016/j.ces.2015.02.032>
35. **Pourkargar D.B.**, Armaou A., Control of spatially distributed processes with unknown transport-reaction parameters via two-layer system adaptations, *AIChE Journal*, 2015; 61(8):2497-2507
<https://doi.org/10.1002/aic.14852>

Davood B. Pourkargar

Associate Professor, Tim Taylor Department of Chemical Engineering
Warren and Gisela Kennedy Keystone Research Scholar
Kansas State University, Manhattan, KS, Email: dbpourkargar@ksu.edu
<https://che.k-state.edu/about/people/faculty/pourkargar/>
<https://scholar.google.com/citations?user=1lhogOcAAAJ&hl=en>

36. **Pourkargar D.B.**, Armaou A., APOD-based control of linear distributed parameter systems under sensor/controller communication bandwidth limitations, *AIChE Journal*, 2015; 61(2):434-447
<https://doi.org/10.1002/aic.14640>
37. **Pourkargar D.B.**, Armaou A., Geometric output tracking of nonlinear distributed parameter systems via adaptive model reduction, *Chemical Engineering Science*, 2014; 116:418-427
<https://doi.org/10.1016/j.ces.2014.05.030>
38. **Pourkargar D.B.**, Armaou A., Modification to adaptive model reduction for regulation of distributed parameter systems with fast transients, *AIChE Journal*, 2013; 59(12):4595-4611 (**Finalist for the Best Paper Award, Department of Chemical Engineering, The Pennsylvania State University, 2014**)
<https://doi.org/10.1002/aic.14207>
39. **Pourkargar D.B.**, Shahrokhi M., Optimal fuzzy synchronization of generalized Lorenz chaotic systems, *The Journal of Mathematics and Computer Science*, 2011; 2(1):27-36 (**Invited Paper**)
<http://dx.doi.org/10.22436/jmcs.002.01.04>

Proceedings Papers:

40. Bagheri A., **Pourkargar D.B.**, A distributed machine learning approach for cyberattack detection in integrated process systems, *In Proceedings of the 65th IEEE Conference on Decision and Control*, Honolulu, HI, 2026 (**Under Review**)
41. Bagheri A., Ebrahimi A., **Pourkargar D.B.**, A distributed machine learning approach for cyberattack detection in integrated process systems, *In Proceedings of the American Control Conference (ACC)*, New Orleans, LA, 2026; 4241-4247 (**In Press**)
42. Bagheri A., Cabral T.O., **Pourkargar D.B.**, Learning-based estimation and predictive control of an ammonia synthesis reactor, *In Proceedings of the American Control Conference (ACC)*, Denver, CO, 2025; 2311-2316
<https://doi.org/10.23919/ACC63710.2025.11107844>
43. Ebrahimi A., **Pourkargar D.B.**, An adaptive distributed architecture for state estimation and control of integrated process networks during operational transitions, *In Proceedings of the American Control Conference (ACC)*, Denver, CO, 2025; 3267-3272 <https://doi.org/10.23919/ACC63710.2025.11107915>
44. Cabral T.O., **Pourkargar D.B.**, Nonlinear model predictive control of a modular hydrogen-ammonia and renewable energy generation system, *In Proceedings of the American Control Conference (ACC)*, Denver, CO, 2025; 2402-2407 <https://doi.org/10.23919/ACC63710.2025.11107711>
45. Marmolejo C.E.V., **Pourkargar D.B.**, Nonlinear model predictive control of a particulate polysilicon reactor system for enhanced solar cell production, *IFAC-PapersOnLine*, 2024; 58(14): 531-537
<https://doi.org/10.1016/j.ifacol.2024.08.391>
46. Ebrahimi A., **Pourkargar D.B.**, Distributed estimation and control of process networks using adaptive community detection, *IFAC-PapersOnLine*, 2024; 58(14): 754-760 <https://doi.org/10.1016/j.ifacol.2024.08.428>
47. Cabral T.O., Bagheri A., **Pourkargar D.B.**, Learning-based model predictive control of an ammonia synthesis reactor, *In Proceedings of the American Control Conference (ACC)*, Toronto, Canada, 2024; 45-50
<https://doi.org/10.23919/ACC60939.2024.10644317>
48. Ebrahimi A., **Pourkargar D.B.**, Distributed model predictive control of integrated process networks based on an adaptive community detection approach, *In Proceedings of the American Control Conference (ACC)*, Toronto, Canada, 2024; 208-213 <https://doi.org/10.23919/ACC60939.2024.10644230>
49. Bagheri A., Patrignani A., Ghanbarian B., **Pourkargar D.B.**, A physics-informed machine learning approach to predict soil water content for agricultural decision-making, *In Proceedings of the American Control Conference (ACC)*, Toronto, Canada, 2024; 2-7 <https://doi.org/10.23919/ACC60939.2024.10644411>
50. Sundberg B., **Pourkargar D.B.**, Cyberattack awareness and resiliency of integrated moving horizon estimation and model predictive control of complex process networks, *In Proceedings of the American Control Conference (ACC)*, San Diego, CA, 2023; 3815-3820 <https://doi.org/10.23919/ACC55779.2023.10155964>

Davood B. Pourkargar

Associate Professor, Tim Taylor Department of Chemical Engineering
Warren and Gisela Kennedy Keystone Research Scholar
Kansas State University, Manhattan, KS, Email: dbpourkargar@ksu.edu
<https://che.k-state.edu/about/people/faculty/pourkargar/>
<https://scholar.google.com/citations?user=1lhogOcAAAJ&hl=en>

51. Hinkel P., **Pourkargar D.B.**, An integrated moving horizon estimation and model predictive control framework for semi-closed greenhouse systems, *In Proceedings of the IEEE Conference on Control Technology and Applications (CCTA)*, Trieste, Italy, 2022; 699-705 <https://doi.org/10.1109/CCTA49430.2022.9966060>
52. **Pourkargar D.B.**, Jogwar S.S., Distributed model predictive control of integrated process networks: Optimal decomposition for varying operating point, *In Proceedings of the American Control Conference (ACC)*, New Orleans, LA, 2021; 801-807 <https://doi.org/10.23919/ACC50511.2021.9482801>
53. **Pourkargar D.B.**, Armaou A., Control of semilinear dissipative distributed parameter systems with minimum feedback information, *In Proceedings of the American Control Conference (ACC)*, Denver, CO, 2020; 2685-2691 <https://doi.org/10.23919/ACC45564.2020.9147399>
54. Moharir M., **Pourkargar D.B.**, Almansoori A., Daoutidis P., Decomposition and distributed control of integrated lumped and distributed parameter process networks, *In Proceedings of the IEEE Conference on Decision and Control (CDC)*, Miami Beach, FL, 2018; 2908-2913 (**Invited Paper**) <https://doi.org/10.1109/CDC.2018.8619216>
55. **Pourkargar D.B.**, Almansoori A., Daoutidis, P., Distributed model predictive control of process networks: Impact of control architecture, *IFAC-PapersOnLine*, 2017; 50(1): 12452-12257 <https://doi.org/10.1016/j.ifacol.2017.08.1920>
56. **Pourkargar D.B.**, Armaou A., Spatiotemporal response shaping of transport-reaction processes via adaptive reduced order models, *In Proceedings of the American Control Conference (ACC)*, Boston, MA, 2016; 4157-4162 <https://doi.org/10.1109/ACC.2016.7525575>
57. **Pourkargar D.B.**, Armaou A., Adaptive control of chemical distributed parameter systems, *IFAC-PapersOnLine*, 2015; 48(8): 681-686 <https://doi.org/10.1016/j.ifacol.2015.09.047>
58. **Pourkargar D.B.**, Armaou A., Low-dimensional adaptive output feedback controller design for transport-reaction processes, *In Proceedings of the European Control Conference (ECC)*, Linz, Austria, 2015; 879-884 <https://doi.org/10.1109/ECC.2015.7330654>
59. **Pourkargar D.B.**, Armaou A., Wave motion suppression in the presence of unknown parameters using recursively updated empirical basis functions, *In Proceedings of the American Control Conference (ACC)*, Chicago, IL, 2015; 2619-2624 (**Best Session Presentation Award in American Control Conference, 2015, Session ThA16**) <https://doi.org/10.1109/ACC.2015.7171129>
60. **Pourkargar D.B.**, Armaou A., Output tracking of spatiotemporal thermal dynamics in transport-reaction processes via adaptive model reduction, *In Proceedings of the American Control Conference (ACC)*, Portland, OR, 2014; 3364-3370 <https://doi.org/10.1109/ACC.2014.6859206>
61. **Pourkargar D.B.**, Armaou A., Feedback control of linear distributed parameter systems via adaptive model reduction in the presence of device network communication constraints, *In Proceedings of the American Control Conference (ACC)*, Portland, OR, 2014; 1667-1673 (**Invited Paper**) <https://doi.org/10.1109/ACC.2014.6859125>
62. **Pourkargar D.B.**, Armaou A., A refined adaptive model reduction approach for control of fast-evolving distributed parameter systems, *In Proceedings of the 21st International Symposium on Mathematical Theory of Networks and Systems (MTNS)*, Groningen, Netherlands, 2014; 140-147 (**Invited Paper**)
63. **Pourkargar D.B.**, Armaou A., Control of dissipative partial differential equation systems using APOD based dynamic observer designs, *In Proceedings of the American Control Conference (ACC)*, Washington DC, 2013; 502-508 (**Invited Paper, O. Hugo Schuck Best Paper Award in the Application Category, American Automatic Control Council (AACC), 2014, Best Session Presentation Award in American Control Conference, 2013, Session MoA14**) <https://doi.org/10.1109/ACC.2013.6579887>

CONFERENCE PRESENTATIONS

1. **Pourkargar D.B.**, Dowling A., Digital twins in process systems engineering, FOCAPO-CPC: Foundation of Computer Aided Process Operations – Chemical Process Control, Tucson, AZ, 2027 (**Keynote Presentation**)

Davood B. Pourkargar

Associate Professor, Tim Taylor Department of Chemical Engineering
Warren and Gisela Kennedy Keystone Research Scholar
Kansas State University, Manhattan, KS, Email: dbpourkargar@ksu.edu
<https://che.k-state.edu/about/people/faculty/pourkargar/>
<https://scholar.google.com/citations?user=1lhogOcAAAJ&hl=en>

2. **Pourkargar D.B.**, A physics-informed machine learning framework for autonomous synthesis of functional materials, Symposium MT03 on AI-Driven Workflows and Autonomous Platforms for Functional Material Design and Catalysis, MRS Fall Meeting & Exhibit, Boston, MA, 2026 (**Invited Presentation**)
3. **Pourkargar D.B.**, Multiscale digital twins for autonomous process systems in emerging manufacturing applications, Next-Gen Manufacturing Topical Conference, AIChE Annual Meeting, Minneapolis, MN, 2026
4. Bagheri A., Albright C., **Pourkargar D.B.**, A cluster-based distributed hybrid and physics-informed time series modeling approach for predicting soil water content in precision agriculture, AIChE Annual Meeting, Minneapolis, MN, 2026
5. Bagheri A., Tobar E., Yucel U., Trinetta V., **Pourkargar D.B.**, A physics-informed machine learning framework for predictive dynamic modeling and optimal control of microbial inactivation by oxidative sanitizers, AIChE Annual Meeting, Minneapolis, MN, 2026
6. Ebrahimi A., Mondal N., Duan C., Liu B., **Pourkargar D.B.**, An integrated framework for predictive first-principles and atomistic modeling of solid-state perovskite oxide synthesis for energy applications, AIChE Annual Meeting, Minneapolis, MN, 2026
7. Ebrahimi A., Bagheri A., Adeoye S., Cabral T.O., Amama P.B., **Pourkargar D.B.**, An uncertainty-aware physics-informed learning method for predictive multiscale modeling of chemical vapor deposition in carbon nanotube synthesis, AIChE Annual Meeting, Minneapolis, MN, 2026
8. **Pourkargar D.B.**, A physics-informed machine learning framework for autonomous additive manufacturing of functional materials (108e), Next-Gen Manufacturing Topical Conference, AIChE Annual Meeting, Boston, MA, 2025
9. Bagheri A., Sheikhzadeh S., Alavi S., **Pourkargar D.B.**, Multimodal machine learning for predictive structural characterization of plant-based meat products in food extrusion processes (124c), AIChE Annual Meeting, Boston, MA, 2025
10. Bagheri A., Ebrahimi A., **Pourkargar D.B.**, A data-driven transformer-based framework for cyber-process incident detection and state reconstruction in highly integrated process systems (243d), Next-Gen Manufacturing Topical Conference, AIChE Annual Meeting, Boston, MA, 2025
11. Ebrahimi A., Cabral T.O., Ighalo J., Amama P.B., **Pourkargar D.B.**, Data-driven discrepancy quantification in microkinetic modeling of catalytic processes via Bayesian calibration (329f), AIChE Annual Meeting, Boston, MA, 2025
12. Bagheri A., Cabral T.O., **Pourkargar D.B.**, Nonlinear model predictive control of ammonia synthesis and separation process using integrated surrogate modeling (391d), AIChE Annual Meeting, Boston, MA, 2025
13. Cabral T.O., **Pourkargar D.B.**, Moving horizon optimization of a renewable-driven chemical-energy community under varying disruptions (467h), AIChE Annual Meeting, Boston, MA, 2025
14. Ebrahimi A., Cabral T.O., **Pourkargar D.B.**, Digital twin modeling of liver-on-a-chip systems: Integrating computational fluid dynamics and biochemical kinetics for drug metabolism studies (595g), AIChE Annual Meeting, Boston, MA, 2025
15. **Pourkargar D.B.**, Resilient multi-agent estimation and control of complex process networks (702a), Next-Gen Manufacturing Topical Conference, AIChE Annual Meeting, San Diego, CA, 2024 (**Keynote Presentation**)
16. Bagheri A., **Pourkargar D.B.**, A physics-informed deep learning approach to predict soil water content for agricultural decision-making (579a), AIChE Annual Meeting, San Diego, CA, 2024
17. Ebrahimi A., **Pourkargar D.B.**, Dynamic graph-based distributed estimation and control of fast-evolving complex process networks (664f), AIChE Annual Meeting, San Diego, CA, 2024
18. Bagheri A., Cabral T.O., **Pourkargar D.B.**, Time-series integrated surrogate modeling for control of ammonia synthesis and adsorption processes (711a), AIChE Annual Meeting, San Diego, CA, 2024
19. Marmolejo C.E.V., **Pourkargar D.B.**, Predictive modeling and optimal control of a particulate polysilicon reactor system for enhanced solar cell manufacturing (617c), AIChE Annual Meeting, San Diego, CA, 2024

Davood B. Pourkargar

Associate Professor, Tim Taylor Department of Chemical Engineering
Warren and Gisela Kennedy Keystone Research Scholar
Kansas State University, Manhattan, KS, Email: dbpourkargar@ksu.edu
<https://che.k-state.edu/about/people/faculty/pourkargar/>
<https://scholar.google.com/citations?user=1lhogOcAAAAJ&hl=en>

20. Ebrahimi A., Bagheri A., **Pourkargar D.B.**, A distributed data-driven predictive modeling approach for cyber-process incident identification using spectral community detection (375d), AIChE Annual Meeting, San Diego, CA, 2024
21. Cabral T.O., **Pourkargar D.B.**, Predictive modeling and optimal regulation of modular hydrogen-ammonia systems with renewable energy integration for resilient chemical-energy conversion (564d), AIChE Annual Meeting, San Diego, CA, 2024
22. **Pourkargar D.B.**, Physics-informed machine learning modeling for characterization and control of plant-based meat processing systems, The 5th International Electronic Conference on Foods: The Future of Technology, Sustainability, and Nutrition in the Food Domain, 2024 (**Invited Presentation**)
23. Sheikhzadeh S., Das S., **Pourkargar D.B.**, Alavi S., Characterization of structural attributes of plant-based meat alternatives using machine learning-based image analysis, Conference of Food Engineering (CoFE), Seattle, WA, 2024
24. Ebrahimi A., **Pourkargar D.B.**, Distributed estimation and model predictive control of integrated nonlinear process systems using an adaptive community detection approach (295d), AIChE Annual Meeting, Orlando, FL, 2023
25. Cabral T.O., Bagheri A., **Pourkargar D.B.**, Learning-based data reconstruction and predictive modeling of an ammonia synthesis process for state estimation and control applications (207g), AIChE Annual Meeting, Orlando, FL, 2023
26. Cabral T.O., Bagheri A., **Pourkargar D.B.**, A Deep Learning-Based Model Reduction and Control of an Ammonia Synthesis Process (12f), AIChE Annual Meeting, Phoenix, AZ, 2022
27. Hinkel P., **Pourkargar D.B.**, Optimization-Based Estimation and Control of Renewable Energy-Powered Greenhouse Systems (484d), AIChE Annual Meeting, Phoenix, AZ, 2022
28. Hinkel P., **Pourkargar D.B.**, Model Predictive Control of Green-Powered Zero Waste Urban Plant Factories for Sustainable Food Production (587f), AIChE Annual Meeting, Phoenix, AZ, 2022
29. **Pourkargar D.B.**, Armaou A., Output feedback control of nonlinear distributed parameter systems with unknown parameters using a two-tier adaptive identification method (105d), AIChE Annual Meeting, Boston, MA, 2021
30. **Pourkargar D.B.**, Model predictive control of integrated energy and chemical manufacturing systems (537h), AIChE Annual Meeting, Boston, MA, 2021
31. **Pourkargar D.B.**, Output feedback control of integrated lumped and distributed parameter systems using mobile sensor network (172g), AIChE Annual Meeting, San Francisco, CA, 2020
32. **Pourkargar D.B.**, Jogwar S.S., Distributed model predictive control of integrated process networks using community detection (687g), AIChE Annual Meeting, San Francisco, CA, 2020
33. **Pourkargar D.B.**, Armaou A., Constrained control of dissipative distributed parameter systems via on-demand data-driven model reduction (399a), AIChE Annual Meeting, San Francisco, CA, 2020
34. **Pourkargar D.B.**, Moharir M., Almansoori A., Daoutidis P., Distributed estimation and nonlinear control of a benzene chlorination process (40h), AIChE Annual Meeting, Pittsburgh, PA, 2018
35. **Pourkargar D.B.**, Optimization-based control of complex process networks in smart manufacturing: The appearance of cyber-physical systems, cloud computing, and big data analytics (6id), AIChE Annual Meeting, Pittsburgh, PA, 2018
36. Moharir M., **Pourkargar D.B.**, Almansoori A., Daoutidis P., Graph representation and decomposition of diffusion-convection-reaction processes for distributed control (560a), AIChE Annual Meeting, Pittsburgh, PA, 2018
37. Tang W., Allman A., **Pourkargar D.B.**, Daoutidis P., Decomposition of optimization problems using community detection and its application in nonlinear model predictive control (359f), AIChE Annual Meeting, Pittsburgh, PA, 2018

Davood B. Pourkargar

Associate Professor, Tim Taylor Department of Chemical Engineering
Warren and Gisela Kennedy Keystone Research Scholar
Kansas State University, Manhattan, KS, Email: dbpourkargar@ksu.edu
<https://che.k-state.edu/about/people/faculty/pourkargar/>
<https://scholar.google.com/citations?user=1lhogOcAAAJ&hl=en>

38. **Pourkargar D.B.**, Almansoori A., Daoutidis P., Distributed model predictive control of complex plants: A systematic study of decomposition effects (497a), AIChE Annual Meeting, Minneapolis, MN, 2017
39. **Pourkargar D.B.**, Moharir M., Tang W., Almansoori A., Daoutidis P., Nonlinear distributed model predictive control of gas sweetening processes (170a), AIChE Annual Meeting, Minneapolis, MN, 2017 (**Best Paper in the Session Award, Session 170: Process Control Applications**)
40. Tang W., **Pourkargar D.B.**, Daoutidis P., Relative time averaged gain array for distributed architecture design (497g), AIChE Annual Meeting, Minneapolis, MN, 2017
41. **Pourkargar D.B.**, Optimization-based control of complex process networks: Application to medicine and energy systems (7iq), AIChE Annual Meeting, Minneapolis, MN, 2017
42. **Pourkargar D.B.**, Armaou A., Output Feedback Control of Transport-Reaction Processes with Unknown Parameters Using Adaptive Model Reduction with Minimum Feedback Information (582b), AIChE Annual Meeting, San Francisco, CA, 2016
43. **Pourkargar D.B.**, Armaou A., Adaptive output feedback control of transport-reaction processes via two-layer system adaptations (569g), AIChE Annual Meeting, Salt Lake City, UT, 2015 (**Finalist for the AIChE Computing and Systems Technology (CAST) Director's Student Presentation Award**)
44. **Pourkargar D.B.**, Armaou A., Estimation of spatially distributed processes via adaptive model reduction using mobile sensor network (583a), AIChE Annual Meeting, Salt Lake City, UT, 2015
45. **Pourkargar D.B.**, Shahri S.M.K., Rioux, R.M., Armaou A., Spatiotemporal modeling and identification of CO₂ adsorption columns (662d), AIChE Annual Meeting, Salt Lake City, UT, 2015
46. **Pourkargar D.B.**, Robust adaptive model predictive control of chemical and biological systems (6it), AIChE Annual Meeting, Salt Lake City, UT, 2015
47. **Pourkargar D.B.**, Armaou A., Adaptive control of dissipative distributed parameter systems via recursively updated reduced order models (555f), AIChE Annual Meeting, Atlanta, GA, 2014
48. **Pourkargar D.B.**, Armaou A., Shaping the spatiotemporal dynamics of transport-reaction processes via adaptive proper orthogonal decomposition (610h), AIChE Annual Meeting, Atlanta, GA, 2014
49. **Pourkargar D.B.**, Armaou A., Estimation of distributed parameter systems using recursively updated empirical basis functions (568y), AIChE Annual Meeting, Atlanta, GA, 2014
50. **Pourkargar D.B.**, Armaou A., Robust dynamic shaping of distributed parameter systems via recursively updated empirical basis functions, Session CP7, SIAM Annual Meeting, Chicago, IL, 2014
51. **Pourkargar D.B.**, Armaou A., Output Feedback Control of Nonlinear Distributed Parameter Systems via Adaptive Model Order Reduction, Department of Chemical Engineering Research Symposium, The Pennsylvania State University, University Park, PA, 2014
52. **Pourkargar D.B.**, Armaou A., Control of fast-evolving distributed parameter systems via information-aware model reduction recursions, 11th Annual College of Engineering Research Symposium (CERS), The Pennsylvania State University, University Park, PA, 2014
53. **Pourkargar D.B.**, Armaou A., APOD-based control of spatially distributed processes with limited sensor/controller communication bandwidth, 11th Annual College of Engineering Research Symposium (CERS), The Pennsylvania State University, University Park, PA, 2014
54. **Pourkargar D.B.**, Armaou A., Output feedback control of transport-reaction processes based on adaptive model reduction in the presence of sensor communication constraints (613a), AIChE Annual Meeting, San Francisco, CA, 2013
55. **Pourkargar D.B.**, Armaou A., Improving model reduction approaches for output feedback control of fast-evolving spatially distributed processes (589c), AIChE Annual Meeting, San Francisco, CA, 2013
56. **Pourkargar D.B.**, Armaou A., Design of recursively updated reduced order dynamic observers for distributed parameter systems, Session CP4, SIAM Conference on Control and its Application, San Diego, CA, 2013

Davood B. Pourkargar

Associate Professor, Tim Taylor Department of Chemical Engineering
Warren and Gisela Kennedy Keystone Research Scholar
Kansas State University, Manhattan, KS, Email: dbpourkargar@ksu.edu
<https://che.k-state.edu/about/people/faculty/pourkargar/>
<https://scholar.google.com/citations?user=1lhogOcAAAAJ&hl=en>

57. **Pourkargar D.B.**, Armaou A., Output feedback control of distributed parameter systems based on adaptive model reduction, 10th Annual College of Engineering Research Symposium (CERS), University Park, PA, 2013
58. **Pourkargar D.B.**, Armaou A., Output feedback control of transport reaction processes using adaptive proper orthogonal decomposition (747d), AIChE Annual Meeting, Pittsburgh, PA, 2012
59. **Pourkargar D.B.**, Orkomi A.A., Boozarjomehry B.R., Thermodynamic and transport properties estimation of a complicated mixture of hydrocarbons by fuzzy clustering methods, 19th International Congress of Chemical and Process Engineering (CHISA19) and the 7th European Congress of Chemical Engineering (ECCE-7), Prague, Czech Republic, 2010
60. Orkomi A.A., **Pourkargar D.B.**, Boozarjomehry R.B., Approximate fuzzy feedback linearization of amine gas sweetening plant via genetic algorithm, 19th International Congress of Chemical and Process Engineering (CHISA19) and the 7th European Congress of Chemical Engineering (ECCE-7), Prague, Czech Republic, 2010
61. **Pourkargar D.B.**, Orkomi A.A., Boozarjomehry R.B., Fuzzy clustering of complex hydrocarbon mixtures, 4th International Conference of Fuzzy Information & Engineering, Amol, 2010
62. **Pourkargar D.B.**, Shahrokhi M., Optimal fuzzy synchronization, 4th International Conference of Fuzzy Information & Engineering, Amol, 2010
63. Orkomi A.A., **Pourkargar D.B.**, Boozarjomehry R.B., Effects of transfer function selection on optimal approximate feedback linearization of CO₂ Absorption by amine solution, 1st International Regional Chemical & Petroleum Engineering Conference & 13th National Iranian Chemical Engineering Congress, Kermanshah, 2010
64. **Pourkargar D.B.**, Shahrokhi M., Synchronization of two chaotic chemical reactors, 1st International Regional Chemical & Petroleum Engineering Conference & 13th National Iranian Chemical Engineering Congress, Kermanshah, 2010
65. **Pourkargar D.B.**, Orkomi A.A., Boozarjomehry R.B., Fuzzy feedforward control of amine gas sweetening plant, International Conference of Control, Instrumentation and Automation (ICCIA), Tehran, 2010
66. **Pourkargar D.B.**, Orkomi A.A., Boozarjomehry R.B., Control of amine gas sweetening plant by approximate fuzzy feedback linearization via genetic algorithm, International Conference of Control, Instrumentation and Automation (ICCIA), Tehran, 2010
67. **Pourkargar D.B.**, Orkomi A.A., Comparison between PID and a novel model-based controller in interactive chemical plants control, International Conference of Control, Instrumentation and Automation (ICCIA), Tehran, 2010

INVITED SEMINARS

1. A digital twin framework for predictive modeling of liver-on-a-chip system dynamics, Terasaki Institute for Biomedical Innovation, Los Angeles, CA, 2025
2. Physics-informed machine learning for characterization, predictive modeling, and optimization of agri-food and biosystems, Center for Grain and Animal Health, Agricultural Research Service, US Department of Agriculture, Manhattan, KS, 2025
3. A learning-based predictive modeling and decision-making framework for functional materials synthesis and integrated chemical manufacturing systems, University of Arkansas, Fayetteville, AR, 2025
4. Physics-informed machine learning for characterization, predictive modeling, and optimization of agri-food and biomedical systems, Department of Biochemistry and Molecular Biophysics, Kansas State University, Manhattan, KS, 2024
5. Physics-informed machine learning: from process systems engineering to decoding disease and drug-delivery dynamics using organ-on-a-chip data, Terasaki Institute for Biomedical Innovation, Los Angeles, CA, 2024
6. A learning-based multiscale predictive modeling framework for optimal control of advanced materials manufacturing systems, Materials Informatics Webinar, NASA Glenn Research Center, 2024

Davood B. Pourkargar

Associate Professor, Tim Taylor Department of Chemical Engineering
Warren and Gisela Kennedy Keystone Research Scholar
Kansas State University, Manhattan, KS, Email: dbpourkargar@ksu.edu
<https://che.k-state.edu/about/people/faculty/pourkargar/>
<https://scholar.google.com/citations?user=1lhogOcAAAAJ&hl=en>

7. A learning-based multiscale predictive modeling and decision-making framework for integrated renewable energy and chemical manufacturing systems, Department of Industrial and Manufacturing Systems Engineering, Kansas State University, Manhattan, KS, 2024
8. Optimization-based control of complex process networks, Department of Chemical Engineering, University of California, Davis, CA, 2019
9. Optimization-based control of complex process networks, ExxonMobil Research and Engineering, Spring, TX, 2018
10. Optimization-based control of complex process networks, Department of Chemical Engineering, Kansas State University, Manhattan, KS, 2018
11. Optimization-based control of complex process networks, Pfizer Global Research and Development, Groton, CT, 2018
12. Optimization-based control of complex process networks, Department of Biomedical and Chemical Engineering and Sciences, Florida Institute of Technology, Melbourne, FL, 2018
13. Optimization-based control of complex process networks, Department of Chemical and Environmental Engineering, University of Cincinnati, Cincinnati, OH, 2018
14. Optimization-based control of complex process networks, Department of Chemical, Biological and Bioengineering, North Carolina A&T State University, Greensboro, NC, 2018
15. Optimization-based control of complex process networks: Handling complexity through model reduction and system decomposition, William G. Lowrie Department of Chemical and Biomolecular Engineering, The Ohio State University, Columbus, OH, 2018
16. Optimization-based control of complex process networks, Distinguished Junior Researcher Seminar, Robert Frederick Smith School of Chemical and Biomolecular Engineering, Cornell University, Ithaca, NY, 2017
17. Output feedback control of transport-reaction processes via two-layer system adaptations, Applied and Computational Mathematics Research Program, Princeton University, Princeton, NJ, 2015

PROFESSIONAL ACTIVITIES

- Associate Editor, American Control Conferences, 2021-2023, 2025, 2026
- Chair/Co-Chair for 25 sessions on Process Modeling, Control, and Artificial Intelligence at the AIChE Annual Meetings, Next-Gen Manufacturing Topical Conferences, and American Control Conferences, 2020-2026
- Reviewer for >20 scientific journals
- Panelist for >10 proposal review panels organized by NSF, DOE, USDA, ACS, and FFAR
- Review Editor, Frontiers in Chemical Engineering, 2022-Present
- Senior Member of American Institute of Chemical Engineers (AIChE), 2013-Present
 - AIChE Computing and System Technology (CAST) Division, AIChE Catalysis and Reaction Engineering (CRE) Division, Institute for Sustainability, Process Development Division, Education Division
- Member of the Institute of Electrical and Electronics Engineers (IEEE), 2012-Present
 - IEEE Control Systems Society (CSS), IEEE Young Professionals, IEEE Cloud Computing Community, IEEE Internet of Things Community, IEEE Smart Grid Community, IEEE Consultants Network, IEEE SIGHT, IEEE Sensors Council, IEEE Systems Council
- Member of Society for Industrial and Applied Mathematics (SIAM), 2012-Present
 - SIAM Activity Groups on Control and Systems Theory (SIAG/CST), Analysis of Partial Differential Equations (SIAG/APDE), Uncertainty Quantification (SIAG/UQ), Data Mining and Analytics (SIAG/DMA), Optimization, Computational Science and Engineering (SIAG/CS&E), Dynamical Systems