CURRICULUM VITAE

NAME

Michael **Nikolaou**

BIRTHDATE

April 14, 1960

EDUCATION

PhD, Chemical Engineering, University of California, Los Angeles, 1989.
Diploma, Chemical Engineering, National Technical University, Athens, Greece, 1984.

PROFESSIONAL EXPERIENCE

Academic

Professor, Chemical Engineering Dept., University of Houston, (2007-present)
Associate Professor, Chemical Engineering Dept., University of Houston, 9/97-8/07.
Associate Professor, Chemical Engineering Dept., Texas A&M University, 9/95-8/97.
Visiting Scientist, Chemical Engineering Dept., MIT, Fall 1995.
Assistant Professor, Chemical Engineering Dept., Texas A&M University, 9/89-8/95
Teaching/Research Assistant, Chemical Engineering Dept., UCLA, 1/86-8/89.

Industrial

Process Engineer/Computer Specialist, Union Pacific Resources, Bryan, TX, Summer 1991.

PROFESSIONAL RECOGNITION

Chairmanship of National Meetings:

Session chair

AIChE Annual Meeting (several)
AIChE Spring Meeting (several)

Programming Committee member

American Control Conference (several)
ESCAPE 6
DYCOPS 5
ADCHEM 2003, 2009
FOCAPO 2008
IFAC World Congress, 2009
SPE Workshop on Bridging the Gap Between Reservoir Engineering and Facilities Design, 2012 (Organizing Committee)

International Programming Committee Chair

IFAC Conference on Control of Offshore Oil & Gas Drilling Operations, Trondheim, Norway, 2012
FOCAPO/CPC 2023

U.S. Well - Exhibit 2023
Liberty v. U.S. Well - IPR2025-00066
Page 1 of 23

Awards

Fluor Award, Highest distinction of Cullen College of Engineering, 2019
Dukler Award, Cullen College of Engineering Alumni Award, 2017
Cullen College of Engineering Senior Faculty Research Excellence Award, 2010
"Professor Solution" in "Automation Avengers" educational campaign, ISA, 2008
CAST Directors Poster Paper Award (with M. Darby), AIChE Annual Meeting, 2007
Top 2% Reviewer, Automatica (leading int'l journal on automatic control), 2007
Cullen College of Engineering Teaching Excellence Award, 2007
3rd place, Keck Center 2005 Annual Research Conference Poster Contest
Halliburton Energy Services Award, for paper SPE 71647 (co-authored with M. J. Economides and S. Sankaran)
TEES Fellow, Texas A&M, 1996, 1997
Professor of the Year, Texas A&M AIChE Student Chapter, 1994
Junior TEES Fellow, Texas A&M 1992
Teaching Assistant of the Year, UCLA 1988

TEACHING

Undergraduate

Numerical & Statistical Methods for Chemical Engineers (CHEE 3334, Junior UH)
Process Dynamics & Control (CHEE 3367, Junior UH)
Introduction to Computing for Engineers (CHEE/INDE/CIVE 1331, Freshman/Sophomore UH)
Modeling and Analytical Methods for Chemical Engineers (CHEE 3321, Junior UH)
Plant Economics (Senior, TAMU)
Plant Design (Senior, TAMU)
Chemical Engineering Thermodynamics I (Sophomore, TAMU)
Statistical Methods in Chemical Engineering (Senior elective, TAMU)
Statistical Quality Control Methods (Senior elective, TAMU)
Written and oral communication for chemical engineers (Junior, TAMU)

Graduate

Mathematical Methods in Chemical Engineering (CHEE 6331)
Foundations of Mathematical Methods in Chemical Engineering (CHEE 6397/6330)
Advanced Process Control (CHEE 6367/5367)
Data Analysis and Design of Experiments (Lectures in Experimental Methods – CHEE 6397)
Data Analytics (CHEE 6397)
Gas to Liquids (Lectures in Natural Gas Engineering – PETR 6350)

SUPERVISION OF RESEARCH

PhD Theses Supervision

Texas A&M University

1. Hasmet Genceli (currently with Bryan Research & Engineering)
2. Yong You (currently with Invensys)
3. Vijay Hanagandi (currently Principal of Applied Optimization, Inc.)
4. Harry Sarimveis (currently full Professor, National Technical University, Athens, Greece)
5. Wangyan (Charles) Feng (currently with Hewlett-Packard)
6. Manoj Shouche (currently with Montel Polyolefins)
7. Prem Vuthandam (currently with AspenTech)
8. Alex Schwarm (currently with Applied Materials)
9. Gabe Haarsma (currently with Shell)

U.S. Well - Exhibit 2023
Liberty v. U.S. Well - IPR2025-00066
Page 2 of 23

University of Houston

10. S. Alper Eker – Spring 2001 (currently with General Electric Corporate R&D)
11. Haiyang Zhang – Spring 2002 (currently in China)
12. Dimitri Sagias – Fall 2003 (currently with Bayer, Baytown)
13. Pratik Misra – Spring 2003 (currently with Air Products)
14. Luigi Saputelli – Spring 2003 (co-supervised with M. J. Economides) (currently with Halliburton)
15. Sathish Sankaran – Spring 2003 (co-supervised with M. J. Economides) (currently with Anadarko)
16. Nirmal Tatavalli, Ph.D – Summer 2007 (co-supervised with D. J. Economou) (currently with Shell)
17. Ankur Awasthi, PhD – Spring 2008 (currently with BHP)
18. Mark Darby, PhD – Fall 2008 (currently proprietor of CM*i*D Solutions, LLC)
19. Jan Einar Gravdal, PhD – Summer 2011 (co-supervisor; currently with IRIS, Norway)
20. Oeyvind Breyholtz, PhD – Summer 2011 (co-supervisor; currently with Statoil, Norway)
21. Ajay Singh, PhD – Summer 2012 (currently with Halliburton)
22. Pratik Bhagunde, PhD – Summer 2012 (currently with Astra-Zeneca)
23. Srimoyee Bhattacharya, PhD – Fall 2012 (currently with Shell)
24. Liv Carlsen, PhD – Fall 2012 (co-supervisor; currently with IRIS, Norway).
25. Hans-Peter Lohne, PhD – Summer 2013 (co-supervisor; currently at U. of Stavanger, Norway).
26. Shyam Panjwani, PhD 2017
27. Shobhit Misra, PhD 2017
28. Guofan Luo, PhD 2019 (co-supervisor)
29. Iordanis Kesisoglou, PhD 2022 (with Merck, effective May 2022)
30. Garima Singh, PhD 2023

Masters Theses Supervision

Texas A&M University

1. Yong You
2. Harry Sarimveis
3. Tong Zeng
4. Pablo Echeverria

University of Houston

5. Mohan Cherukuri
6. Diwakar Mantha
7. Cédric Oudinot (co-supervised with M. J. Economides)
8. Bilu Cherian (co-supervised with M. J. Economides)
9. Emre Serpen (co-supervised with Christine Ehlig-Economides)
10. Aysu Öztürk
11. Kevin Ziervogel
12. Aditya Kumar (eventually graduated with non-thesis MS)
13. Parag Kulkarni (ECE student) (co-supervisor) – Summer 2012
14. Kyle MacFarlan, 2014
15. Khanal, Aaditya (PETR), 2014
16. Supriya Gupta (PETR), 2015

17. Yue Lin (PETR; eventually graduated with non-thesis MS)
18. Sunit Mathur (PETR), 2017
19. Bharat Thakur (PETR), 2017
20. Nitish Goyal (PETR), 2018
21. Fahad Alwarda (PETR, co-supervisor), 2020
22. Leila Zeinali (PETR, co-supervisor), 2021
23. Murtaza Khan (PETR, co-supervisor), 2023

U.S. Well - Exhibit 2023
Liberty v. U.S. Well - IPR2025-00066
Page 4 of 23

PUBLICATIONS[1]
Full up to date list is also available at
https://scholar.google.com/citations?hl=en&user=mLs4L3UAAAAJ

1. Refereed Journal Publications (in Chronological Order)

1. **Nikolaou**, M. and V. Manousiouthakis, "A Hybrid Approach to Nonlinear System Stability and Performance", *AIChE Journal,* **35,** 4, 559-572 (1989).
2. Manousiouthakis, V. and M. **Nikolaou**, "Analysis of Decentralized Control Structures for Nonlinear Systems", *AIChE Journal,* **35,** 4, 549-558 (1989).
3. **Nikolaou**, M. and V. Manousiouthakis, "Sensitivity Analysis of Optimal Control Policies for Batch Processes", *Chemical Engineering Communications* **97**, 27-45 (1990).
4. Fan, J. Y., M. **Nikolaou**, and R. E. White, "An Approach to Fault Diagnosis of Chemical Processes via Neural Networks", *AIChE J*. **39**, 1, 82-88 (1993).
5. You, Y., and M. **Nikolaou**, "Dynamic Process Modeling with Recurrent Neural Networks", *AIChE J*., **39**, 10, 1654-1667 (1993).
6. **Nikolaou**, M. and V. Hanagandi, "Input-Output Exact Linearization of Nonlinear Dynamical Systems Modeled by Recurrent Neural Networks", *AIChE J*., **39**, 11, 1890-1894 (1993).
7. Genceli, H., and M. **Nikolaou**, "Robust Stability Analysis of Constrained l_1-Norm Model Predictive Control", *AIChE J*., **39**, 12, 1954-1965 (1993).
8. Holtzapple, M. T., E. P. Ripley, and M. **Nikolaou**, "Saccharification, Fermentation, and Protein Recovery from AFEX-Treated Coastal Bermudagrass", *Biotechnology and Bioengineering*, **44**, 1112–1131 (1994).
9. **Nikolaou**, M., and V. Hanagandi, "Recurrent Neural Networks in Decoupling Control of Multivariable Nonlinear Systems", *Chem. Eng. Communications*, **136**, 201-216 (1995).
10. Vuthandam, P., H. Genceli, and M. **Nikolaou**, "Performance Bounds of Robust Model-Predictive Control", *AIChE J.*, **41**, 9, 2083-2097 (1995).
11. Genceli, H. and M. **Nikolaou**, "Design of Robust Constrained Nonlinear Model Predictive Controllers with Volterra Series", *AIChE J.*, **41**, 9, 2098-2107 (1995).
12. Hanagandi, V., H. Ploehn, and M. **Nikolaou**, "Solution of the Self-Consistent Field Model for Polymer Adsorption by Genetic Algorithms", *Chem. Eng. Sci.* , **51**, 7, 1071-1078 (1996).
13. Sarimveis, H., H. Genceli, and M. **Nikolaou**, "Design of Robust Non-Square Constrained Model Predictive Control", *AIChE J.*, **42**, 9, 2582-2593 (1996).
14. Genceli, H., and M. **Nikolaou**, "New Approach to Constrained Predictive Control with Simultaneous Model Identification", *AIChE J.*, **42**, 10, 2857-2869 (1996).
15. Hanagandi, V., and **Nikolaou**, M. "A Hybrid Approach to Global Optimization Using a Clustering Algorithm in a Genetic Search Framework," *Computers & Chem. Engng.*, **22,** 12, 1913-1925 (1998).
16. **Nikolaou**, M., and V. Hanagandi, "Nonlinearity Quantification and its Application to Nonlinear System Identification", *Chem. Eng. Comm.*, **166**, 1-33 (1998).
17. Shouche M., H. Genceli, P. Vuthandam, and M. **Nikolaou**, "Simultaneous Constrained Model Predictive Control and Identification of DARX Processes", *Automatica*, **34**, 12, 1521-1530 (1998).
18. Moridis, G. J., M. **Nikolaou**, and Y. You, "The Use of Wavelet Transforms in the Solution of Two-Phase Flow Problems", *SPE J.*, **29144**, 169-178 (1996).

[1] Highlights indicate publications with students.

U.S. Well - Exhibit 2023
Liberty v. U.S. Well - IPR2025-00066
Page 5 of 23

19. Shouche, M., H. Genceli, and M. **Nikolaou**, "Dependence of Model Predictive Control and Identification Performance on On-Line Optimization Techniques", *Computers Chem. Engng.,* **26**, 9, 1241-1252 (2002).
20. Vuthandam, P., and M. **Nikolaou**, "Constrained Model Predictive Control and Identification: A Weak Persistent Excitation Approach", *AIChE J.*, **43**, 9, 2279-2288 (1997).
21. **Nikolaou**, M., and P. Vuthandam, "FIR Model Identification: Achieving Parsimony through Kernel Compression with Wavelets", *AIChE J.*, **44**, No. 1, 141-150 (1998).
22. Schwarm, A., and M. **Nikolaou**, "Chance Constrained Model Predictive Control", *AIChE Journal*, **45**, 8, 1743-1752 (1999).
23. Eker, S. A., and M. **Nikolaou**, "Adaptive Control through On-line Optimization: The MPCI Paradigm and Variants", *Appl. Math. And Comp. Sci.*, **9**, 1, 101-128 (1999).
24. **Nikolaou**, M., "Identification and Adaptive Control", *Comp. Chem. Eng., special issue on NSF/NIST Vision 2020 Workshop*, 23/2, pp. 217 - 227, (1998).
25. Zhang, H., Y. Peng, M. **Nikolaou**, "Development of a Data Driven Dynamic Model for a Plasma Etching Reactor", *J. Vac. Sci. Tech.* B 20 (3): 891-901 MAY-JUN 2002.
26. Eker, S. A., and M. **Nikolaou**, "Linear Control of Nonlinear Systems - The Interplay between Nonlinearity and Feedback", *AIChE J.*, 48 (9): 1957-1980 SEP 2002.
27. Misra P, **Nikolaou** M, "Input design for model order determination in subspace identification", *AICHE J* 49 (8): 2124-2132 AUG 2003.
28. **Nikolaou** M, Misra P, "Linear control of nonlinear processes: recent developments and future directions", *COMPUT CHEM ENG* 27 (8-9): 1043-1059 SEP 15 2003.
29. V. H. Tam, A. N. Schilling, and M. **Nikolaou**, "Modelling time-kill studies to discern the pharmacodynamics of meropenem," *Journal Of Antimicrobial Chemotherapy*, vol. 55, pp. 699-706, 2005.
30. V. H. Tam and M. **Nikolaou**, "Mathematical modelling of resistance emergence," *Journal Of Antimicrobial Chemotherapy*, vol. 56, pp. 983-983, 2005.
31. M. **Nikolaou**, P. Misra, V. H. Tam, and A. D. Bailey, "Complexity in semiconductor manufacturing, activity of antimicrobial agents, and drilling of hydrocarbon wells: Common themes and case studies," *Computers & Chemical Engineering*, vol. 29, pp. 2266-2289, 2005.
32. L. Saputelli, M. **Nikolaou**, and M. J. Economides, "Self-learning reservoir management," *SPE Reservoir Evaluation & Engineering*, vol. 8, pp. 534-547, 2005.
33. M. **Nikolaou** and V. H. Tam, "A new modeling approach to the effect of antimicrobial agents on heterogeneous microbial populations," *Journal of Mathematical Biology*, vol. 52, pp. 154-182, 2006.
34. **Nikolaou**, M., "Control of Snack Food Manufacturing Systems: Potato chips and micro-chips are more similar than commonly believed", *IEEE Control Systems Magazine*, **featured on cover of** special issue on process control, 26 (4) : 40-54, 2006.
35. L. Saputelli, M. **Nikolaou** b, and M.J. Economides, "Real-Time Reservoir Management: A Multi-Scale Adaptive Optimization and Control Approach", *J. Computational Geosciences*, invited publication for Special Issue on Closed-Loop Reservoir Management, 10, 61-96, 2006.
36. Darby, M. L., and M. **Nikolaou**, "A Parametric Programming Approach to Moving Horizon State Estimation", *Automatica*, 43 (5): 885-891, 2007.
37. **Nikolaou** M, Schilling AN, Vo G, et al., "Modeling of microbial population responses to time-periodic concentrations of antimicrobial agents" ANNALS OF BIOMEDICAL ENGINEERING 35 (8): 1458-1470 AUG 2007.
38. Tam, V. H.; Schilling, A. N.; Poole, K.; **Nikolaou**, M., Mathematical modelling response of Pseudomonas aeruginosa to meropenem. *Journal Of Antimicrobial Chemotherapy* **2007,** 60, (6), 1302-1309.

U.S. Well - Exhibit 2023
Liberty v. U.S. Well - IPR2025-00066
Page 6 of 23

39. Tam, V. H.; Vo, G.; Kabbara, S.; **Nikolaou**, M., Pharmacodynamics of gentamicin against Pseudomonas aeruginosa: modelling bacterial response to drug-selective pressures. *International Journal Of Antimicrobial Agents* **2007,** 29, S87-S88.
40. Tam, V. H.; Ledesma, K. R.; Vo, G.; Kabbara, S.; Lim, T. P.; **Nikolaou**, M., Pharmacodynamic Modeling of Aminoglycosides against Pseudomonas aeruginosa and Acinetobacter baumannii: Identifying Dosing Regimens To Suppress Resistance Development. *Antimicrobial Agents And Chemotherapy* **2008,** 52, (11), 3987-3993.
41. Lim, T. P.; Ledesma, K. R.; Chang, K. T.; Hou, J. G.; Kwa, A. L.; **Nikolaou**, M.; Quinn, J. P.; Prince, R. A.; Tam, V. H., Quantitative assessment of combination antimicrobial therapy against multidrug-resistant Acinetobacter baumannii. *Antimicrobial Agents And Chemotherapy* **2008,** 52, (8), 2898-2904.
42. Darby, M. L. and M. **Nikolaou**, Multivariable system identification for integral controllability, *Automatica*, 45(10): 2194-2204, **2009**.
43. W. J. Foster, N. Dowla, S. Y. Joshi, M. **Nikolaou**, "The fluid mechanics of scleral buckling surgery for the repair of retinal detachment", *Graefes Arch Clin Exp Ophthalmol*, DOI 10.1007/s00417-009-1198-z, SEP 2009. (ONLINE).
44. M. **Nikolaou**, "Optimizing the Logistics of Compressed Natural Gas Transportation by Marine Vessels", *Journal of Natural Gas Science and Engineering*, 2(1), 1-20, **2010**.
45. Bhagunde P, Chang KT, Singh R, Singh V, Garey KW, **Nikolaou** M, Tam VH, "Mathematical Modeling To Characterize the Inoculum Effect", *Antimicrobial Agents And Chemotherapy*, Volume: 54 Issue: 11 Pages: 4739-4743 Published: NOV 2010.
46. Gravdal, J.E., **Nikolaou**, M., Breyholtz, Ø., and Carlsen, L.A. 2010. Improved Kick Management During MPD by Real-Time Pore-Pressure Estimation. *SPE Drilling & Completion,* 25 (4): 577-584. SPE-124054-PA. doi: 10.2118/124054-PA.
47. Bhagunde, P., R. Singh, K. R. Ledesma, K. T. Chang, M. **Nikolaou** and V. H. Tam (2011). "Modelling biphasic killing of fluoroquinolones: guiding optimal dosing regimen design." *Journal of Antimicrobial Chemotherapy* 66(5): 1079-1086.
48. Breyholtz, Ø., G. Nygaard and M. **Nikolaou** (2011). "Managed-Pressure Drilling: Using Model Predictive Control To Improve Pressure Control During Dual-Gradient Drilling." *SPE Drilling & Completion* 26(2): 182-197.
49. Darby, M. L., M. **Nikolaou**, J. Jones and D. Nicholson (2011). "RTO: An overview and assessment of current practice." *Journal of Process Control* 21(6): 874-884.
50. Diomede, P., M. **Nikolaou** and D. J. Economou (2011). "Voltage waveform to achieve a desired ion energy distribution on a substrate in contact with plasma." *Plasma Sources Science & Technology* 20(4).
51. Economides, M. J. and M. **Nikolaou** (2011). "Technologies for Oil and Gas Production: Present and Future." *AIChE Journal* 57(8): 1974-1982. (Exceprted in *Chemical Engineering Progress*, 8:12, 2011).
52. Tam, V. H. and M. **Nikolaou** (2011). "A Novel Approach to Pharmacodynamic Assessment of Antimicrobial Agents: New Insights to Dosing Regimen Design." **featured on cover of** *PLoS Computational Biology* 7(1). (**Reviewed at Priority Paper Evaluation** by J. Mouton, *Future Microbiol*. (2011) 6(6), 613–616).
53. Guo, B. N., K. Abdelraouf, K. R. Ledesma, K. T. Chang, M. **Nikolaou** and V. H. Tam (2011). "Quantitative Impact of Neutrophils on Bacterial Clearance in a Murine Pneumonia Model." *Antimicrobial Agents and Chemotherapy* 55(10): 4601-4605.
54. Guo, B., Abdelraouf, K., Ledesma, K., **Nikolaou**, M., Tam, V. (2012). "Predicting bacterial fitness cost associated with drug resistance", *Journal of Antimicrobial Chemotherapy* 67(4): 928-932.

55. Breyholtz, Ø. and M. **Nikolaou** (2012). "Drilling Automation: Presenting a Framework for Automated Operations." *SPE Drilling & Completion,* 27(1): 118-126.
56. Darby, M.L. and **Nikolaou**, M. (2012). "MPC: Current practice and challenges". *Control Engineering Practice,* 20(4): 328-342.
57. Bhattacharya, S., and M. **Nikolaou**, (2012). "Unified Fracture Design for Unconventional Reservoirs", *Journal of Natural Gas Science and Engineering*, 9, 184-195.
58. **Nikolaou**, M. (2013). "Computer-Aided Process Engineering in Oil and Gas production", *Computers and Chemical Engineering,* special issue on CPC VIII, 51(0), 96-101. (**Most-downloaded list**)
59. Singh, A., and M. **Nikolaou**, (2013). "Control of a process with unmeasured disturbances that change its steady-state gain sign", *Journal of Process Control*, 23(3): 294-305.
60. Carlsen, L.A., G. Nygaard, and M. **Nikolaou**, (2013). "Evaluation of Control Methods for Drilling Operations with Unexpected Gas Influx", *Journal of Process Control*, 23(3): 306-316.
61. Bhattacharya, S., and M. **Nikolaou**, (2013). "Analysis of Production History for Unconventional Gas Reservoirs with Statistical Methods", *SPE Journal*, 18(5): 878-896.
62. Singh, A. and M. **Nikolaou**, (2014) "Optimal rules for central bank interest rate subject to zero lower bound", *Economics*, 8 (2014-37): 1—67. http://dx.doi.org/10.5018/economics-ejournal.ja.2014-37 .
63. Singh, A., and M. **Nikolaou**, (2014) "Debottlenecking level control for tanks in series", *Journal of Process Control* 24(3): 158-171.
64. Darby, ML, **Nikolaou**, M (2014) "Identification test design for multivariable model-based control: An industrial perspective", *Control Engineering Practice*, 22: 165-180.
65. Tan, MW, Lye, DC, Ng, TM, **Nikolaou**, M, and Tam, VH (2014) "Mathematical Model To Quantify the Effects of Risk Factors on Carbapenem-Resistant Acinetobacter baumannii", *Antimicrobial Agents and Chemotherapy*, 58(9): 5239-5244.
66. Bravo, C, Saputelli, L, Rivas, F, Perez, AG, **Nikolaou**, M, Zangl, G, de Guzman, N, Mohaghegh, S, Nunez, G (2014) "State of the Art of Artificial Intelligence and Predictive Analytics in the E&P Industry: A Technology Survey", *SPE Journal*, 19(4): 547-563.
67. Bhagunde, P, VH Tam, and M **Nikolaou** (2015). Modeling Heterogeneous Bacterial Populations Exposed to Antibiotics: The Logistic-Dynamics Case. *AIChE J,* 61(8) 2385-2393.
68. Panjwani, S and M **Nikolaou** (2016). Experiment Design for Control-Relevant Identification of Partially Known Stable Multivariable Systems. *AIChE J,* DOI 10.1002/aic.15212.
69. Misra, S and M. **Nikolaou** (2015), "Adaptive Design of Experiments for Identification of Dynamic Models subject to Integral Controllability", *Computers and Chemical Engineering*.
70. Bhattacharya, S., & **Nikolaou**, M. (JUN 2016). Comprehensive Optimization Methodology for Stimulation Design of Low-Permeability Unconventional Gas Reservoirs. SPE Journal, 21(3), 947-964.
71. Panjwani, S., & **Nikolaou**, M. (SEP 2016). Ensuring integral controllability for robust multivariable control. *Computers & Chemical Engineering*, 92, 172-179. doi: 10.1016/j.compchemeng.2016.05.004.
72. Panjwani, S., & **Nikolaou**, M. (SEP 2016). Experiment Design for Control-Relevant Identification of Partially Known Stable Multivariable Systems. *AIChE Journal*, 62(9), 2986-3001. doi: 10.1002/aic.15212.
73. Khanal, A., Khoshghadam, M., Lee, W. J., & **Nikolaou**, M. (FEB2017). New forecasting method for liquid rich shale gas condensate reservoirs with data driven approach using principal component analysis. *Journal of Natural Gas Science and Engineering*, 38, 621-637.

U.S. Well - Exhibit 2023
Liberty v. U.S. Well - IPR2025-00066
Page 8 of 23

74. Misra, S., Darby, M., Panjwani, S., & **Nikolaou**, M. (SEP2017). Design of Experiments for Control-Relevant Multivariable Model Identification: An Overview of Some Basic Recent Developments. *Processes*, 5(3).
75. Misra, S., & **Nikolaou**, M. (MAY2017). Adaptive design of experiments for model order estimation in subspace identification. Computers & Chemical Engineering, 100, 119-138.
76. Panjwani, S., McDaniel, J., & **Nikolaou**, M. (NOV2017). Improvement of zonal isolation in horizontal shale gas wells: A data-driven model-based approach. *Journal of Natural Gas Science and Engineering*, 47, 101-113.
77. Misra, S., & **Nikolaou**, M. (NOV 2018). A data-driven modeling approach to zonal isolation of cemented gas wells. *Journal of Natural Gas Science and Engineering*, 59, 262-273. doi: 10.1016/j.jngse.2018.08.028
78. Eales, B. M., C. S. Hudson, I. Kesisoglou, W. Wang, M. **Nikolaou** and V. H. Tam (2021). "Experimental Validation of a Mathematical Framework to Simulate Antibiotics with Distinct Half-Lives Concurrently in an In Vitro Model." *Antibiotics* 10(10): 1256.
79. Luo, G., C. Ehlig-Economides and M. **Nikolaou** (2021). "Advantage of miscible fluid injection and tight oil production through a single-well alternating production-injection procedure over other single-well EOR methods." *Journal of Petroleum Science and Engineering* 199: 108091.
80. **Nikolaou**, M. (2020). "A fundamental inconsistency in the sir model structure and proposed remedies." medRxiv. (not refereed)
81. **Nikolaou**, M. (2020). "Simple Formulas for a Two-Tier Strategy to Flatten the Curve." arXiv preprint arXiv:2004.04271. (not refereed)
82. **Nikolaou**, M. (2020). "Using Feedback on Symptomatic Infections to Contain the Coronavirus Epidemic: Insight from a SPIR Model." medRxiv. (not refereed)
83. Kesisoglou, I., B. M. Eales, K. R. Ledesma, P. R. Merlau, V. H. Tam, W. Wang and M. **Nikolaou** (2021). "Simultaneous in vitro simulation of multiple antimicrobial agents with different elimination half-lives in a pre-clinical infection model." *Computers & Chemical Engineering* 155: 107540.
84. Kesisoglou, I., G. Singh and M. **Nikolaou** (2021). "The Lambert function should be in the engineering mathematical toolbox." *Computers & Chemical Engineering* 148: 107259.
85. Kesisoglou, I., V. H. Tam, A. P. Tomaras and M. **Nikolaou** (2022). "Discerning in vitro pharmacodynamics from OD measurements: A model-based approach." *Computers & Chemical Engineering* 158: 107617.
86. **Nikolaou**, M. (2022). "Ziegler and Nichols meet Kermack and McKendrick: Parsimony in dynamic models for epidemiology." *Computers & Chemical Engineering* 157: 107615.
87. Tam, V. H., H. Abodakpi, W. Wang, K. R. Ledesma, P. R. Merlau, K. Chan, R. Altman, T. T. Tran, M. **Nikolaou** and A. K. Sofjan (2021). "Optimizing pharmacokinetics/pharmacodynamics of β-lactam/β-lactamase inhibitor combinations against high inocula of ESBL-producing bacteria." *Journal of Antimicrobial Chemotherapy* 76(1): 179-183.
88. Ehlig-Economides, C., M. **Nikolaou** and M. A. Khan Methodology to Estimate Low Grade Enhanced Geothermal System (EGS) Reserves Using Heat Extracted from Depleted Wells in High Temperature Shale Gas Formations, OnePetro.
89. Kesisoglou, I., B. M. Eales, P. R. Merlau, V. H. Tam and M. **Nikolaou** (2022). "Deciphering longitudinal optical-density measurements to guide clinical dosing regimen design: A model-based approach." Computer Methods and Programs in Biomedicine 227: 107212.
90. Kesisoglou, I., V. H. Tam, A. P. Tomaras and M. **Nikolaou** (2022). "Discerning in vitro pharmacodynamics from OD measurements: A model-based approach." Computers & chemical engineering 158: 107617.

91. **Nikolaou**, M. (2022). "Revisiting the standard for modeling the spread of infectious diseases." Scientific Reports 12(1): 7077.
92. **Nikolaou**, M. (2022). "Ziegler and Nichols meet Kermack and McKendrick: Parsimony in dynamic models for epidemiology." Computers & Chemical Engineering 157: 107615.
93. Singh, G., M. A. Orman, J. C. Conrad and M. **Nikolaou** (2023). "Systematic design of pulse dosing to eradicate persister bacteria." PLOS Computational Biology 19(1): e1010243.

2. Book Chapters (in Chronological Order)

1. **Nikolaou**, M., and Y. You, "Use of Wavelets for Numerical Solution of Differential Equations", *Wavelet Applications in Chemical Engineering*, B. Joseph and R. Motard (Editors), 209-274, Kluwer (1994).
2. Hanagandi, V., and M. **Nikolaou**, "Applications of Genetic Algorithms in Chemical Engineering", *Practical Handbook of Genetic Algorithms*, Lance Chambers Ed., Volume 2, 221-252, CRC Press (1995).
3. **Nikolaou**, M., "Model Predictive Controllers: A Critical Synthesis of Theory and Industrial Needs", *Advances in Chemical Engineering Series*, Academic Press (2001).
4. **Nikolaou**, M., "Selecting Optimal Dosing Regimens for Antimicrobial Agents: A Data-Driven Modeling Approach", *Optimization in Medicine and Biology*, G. Lim (Editor), Taylor & Francis, (2007).
5. M. **Nikolaou**, "Compressed Natural Gas" in *Advanced Natural Gas Engineering*, X. Wang and M. J. Economides, Gulf Publishing, 2009.

3. Major Reports

Nikolaou, M., Jesse L. Buffington, Angel Herrera, Jr., and Hwang Inkeuk, *Traffic Air Pollution Effects of Elevated, Depressed, and at-Grade Level Freeways in Texas*, FHWA/TX-97/1327-4, Texas Transportation Institute, The Texas A&M University System, College Station, Texas 77843-3135 (1997).

4. Refereed Conference Proceedings Publications (in Chronological Order)

1. Manousiouthakis, V. and M. **Nikolaou**, "On the Nonlinear Block Relative Gain", *Proceedings of the American Control Conference*, Seattle, WA, 2120-2125 (1987).
2. **Nikolaou**, M. and V. Manousiouthakis, "A Hybrid Approach to Nonlinear System Theory", *Proceedings of the 26th IEEE Conference on Decision and Control*, Century City, CA, 2127-2132 (1987).
3. **Nikolaou**, M. and V. Manousiouthakis, "Robust Control of Batch Processes", *Proceedings of the American Control Conference*, Atlanta, GA, 665-670 (1988).
4. **Nikolaou**, M. and V. Manousiouthakis, "On the Characterization and Evaluation of Stability of Nonlinear Systems", *Proceedings of the American Control Conference*, Atlanta, GA, 1559-1564 (1988).
5. **Nikolaou**, M. and V. Manousiouthakis, "Stability Aspects of Exact Linearization Methods: A Hybrid Approach", *Proceedings of the American Control Conference*, San Diego, CA, 2736-2740 (1990).

6. **Nikolaou**, M. and H. Genceli, "Establishing Performance Targets for Model Predictive Control Systems through off-line Optimization", *Proceedings of the American Control Conference*, Boston, MA, 1822-1823 (1991).
7. **Nikolaou**, M., and H. Sarimveis, "Process Modeling with Recurrent Neural Networks", *ANNIE 91 Proceedings* (1991).
8. **Nikolaou**, M., and V. Hanagandi, "Input-Output Exact Linearization of Nonlinear Dynamical Systems Modeled by Recurrent Neural Networks", *ANNIE 91 Proceedings*, St. Louis, MO (1991).
9. **Nikolaou**, M., "When is Nonlinear Dynamic Modeling Necessary?", *ACC Proceedings*, 910-914, San Francisco, CA (1993).
10. **Nikolaou**, M., "Neural Network Modeling of Nonlinear Dynamical Systems", *ACC Proceedings*, 1460-1464, San Francisco, CA (1993).
11. Moridis, G. J., and M. **Nikolaou**, "The Laplace Transform Wavelet (LTW) Method for the Solution of the Equations of Flow and Transport Through Porous Media", *EOS Trans. AGU*, **74**, 43, 307 (1993).
12. Vuthandam, P., H. Genceli, and M. **Nikolaou**, "Analysis and Synthesis Methods for Robust Model Predictive Control", *ADCHEM'94 Proceedings*, Kyoto, JAPAN (1994).
13. **Nikolaou**, M., "The 2-norm for Nonlinear Processes: Application to Modeling and Control Problems", *PSE'94 Proceedings*, Kyongju, KOREA (1994).
14. **Nikolaou**, M., "Teaching Numerical Methods Using Interactive Computer Spreadsheets in Class", *Proceedings of ASEE Annual Conference*, Session 3162, 2731-2736, Edmonton, Canada (1994).
15. Genceli, H., P. Vuthandam, and M. **Nikolaou**, "Analysis and Synthesis Methods for Robust Model Predictive Control", *NATO ASI on Model Based Process Control*, 235-262, Antalya, Turkey (1994).
16. Moridis, G. J., M. **Nikolaou**, and Y. You "The Use of Wavelet Transforms in the Solution of Two-Phase Flow Problems", *Proceedings of SPE 13th Symposium on Reservoir Simulation*, 521-530, San Antonio, TX (1995).
17. Hanagandi, V., S. Brown, R. Sherman, R. Jones, and M. **Nikolaou**, "Control Strategies for the TSTA Distillation Column I", *ACC Proceedings*, 2653-2656 (1995).
18. **Nikolaou**, M., Computer-Aided Process Engineering in the Snack Food Industry, in *Fifth International Conference on Chemical Process Control – CPC V*, AIChE, Kantor et al. (Eds.) (1996).
19. Genceli, H., and M. **Nikolaou**, "A new approach to model predictive control and identification", *1996 IFAC World Congress Proceedings*, San Francisco (July 1996).
20. Sarimveis, H., H. Genceli, and M. **Nikolaou**, "Design of Robust Non-Square Constrained Model Predictive Control", to be included in *European Symposium on Computer-Aided Process Engineering Proceedings*, Rhodes, Greece (May, 1996).
21. Genceli, H., and M. **Nikolaou**, "A New Approach to Constrained Predictive Control with Simultaneous Model Identification", to be included in *European Symposium on Computer-Aided Process Engineering Proceedings*, Rhodes, Greece (May, 1996).
22. **Nikolaou**, M., "Directions in Computer-Aided Process Engineering", *AIChE World Congress Proceedings*, San Diego, CA (1996).
23. **Nikolaou**, M., and B. Joseph, "Intelligent Control", *ISPE 95 Proceedings*, 68-69 (1996).
24. **Nikolaou**, M., and D. Mantha, "Efficient nonlinear modeling using wavelets and related compression techniques", *NSF Workshop on Nonlinear Model Predictive Control*, Ascona, CH (1998).
25. Sankaran, S., M. **Nikolaou**, and M. J. Economides, "Fracture Geometry and Vertical Migration in Multilayered Formations from Inclined Wells", paper SPE 63177, *SPE Annual Meeting*, Dallas (2000).
26. Zhang, H., and M. **Nikolaou**, "Control of Spatial Uniformity in Microelectronics Manufacturing: An Integrated Approach", APC/AEC XII Sematech Workshop, Lake Tahoe (2000).

U.S. Well - Exhibit 2023
Liberty v. U.S. Well - IPR2025-00066
Page 11 of 23

27. Saputelli, L., B. Cherian, K. Grigoriadis, M. **Nikolaou**, C. Oudinot, G. Reddy, M. J. Economides, and C. Ehlig-Economides, "Integration of Computer-Aided High-Intensity Design with Reservoir Exploitation of Remote and Offshore Locations", SPE paper 64621 and *SPE J.,* (2000).
28. Sankaran, S., W. Deeg, M. **Nikolaou**, and M. Economides, "Measurements and Inverse Modeling for Far-Field State of Stress Estimation", SPE paper 71647 (2001).
29. **Nikolaou**, M., and A. D. Bailey, III, "Application of reduced-rank multivariate methods to the monitoring of spatial uniformity of wafer etching", MASM 2002.
30. Saputelli L., Malki H., Canelon J. and M. **Nikolaou**, "A critical overview of artificial neural network applications in the context of continuous oil field optimization" SPE 77703, SPE Annual Meeting (2002).
31. **Nikolaou**, M., and D. Sagias, "Model Identification: Capabilities and Limits", AspenWorld 2002 (Invited Talk).
32. Misra, P., M. **Nikolaou**, and A. D. Bailey, III, "Application of reduced-rank multivariate methods to the analysis of spatial uniformity of Silicon wafer etching", ADCHEM 2003, Hong Kong, 2003 (held in January 2004 because of SARS.)
33. L. Saputelli, M. **Nikolaou**, M. Economides, V. Kelessidis, "Real-Time Decision Making for Value Creation while Drilling", SPE/IADC Middle East Drilling Technology Conference & Exhibition Abu Dhabi, UAE, 20-22 October (2003).
34. Saputelli, L., M. Economides, M. **Nikolaou**, A. Demarchos, "Real-Time Decision Making for Value Creation while Drilling and Well Intervention", paper AADE-03-NTCE-12, 2003 National Technology Conference "Practical Solutions for Drilling Challenges", Radisson Astrodome Houston, Texas, April 1 – 3, (2003).
35. **Nikolaou**, M., and V. H. Tam, "Modeling the effect of antibiotics on bacterial populations of distributed resistance: A system approach" FOSBE 2005, Santa Barbara, CA (2005).
36. **Nikolaou**, M., A. S. Cullick, and L. Saputelli, "Production Optimization: A Moving Horizon Approach", SPE 99358, Intelligent Energy 2006, Amsterdam, NL (2006).
37. **Nikolaou**, M., L. Saputelli, G. Mijares, S. Sankaran , and L. Reis "A Consistent Approach toward Reservoir Simulation at Different Time Scales", SPE 99451, Intelligent Energy 2006, Amsterdam, NL (2006).
38. Darby, M. and M. **Nikolaou**, "RTO: An Overview and Assessment of Current Practice", SICOP/ADCHEM 2006, Gramado, Brazil (2006).
39. A. Awasthi, S. Sankaran, M. **Nikolaou**, L. Saputelli, G. Mijares, "Closing the Gap Between Reservoir Modeling and Production Optimization", SPE 107463-MS (2007).
40. L. A. Carlsen, G. Nygaard, J. E. Gravdal, M. **Nikolaou**, J. Schubert, Performing the Dynamic Shut-In Procedure Because of a Kick Incident When Using Automatic Coordinated Control of Pump Rates and Choke-Valve Opening, SPE 113693-MS (2008).
41. A. Awasthi, S. Sankaran, M. **Nikolaou**, L. Saputelli, G. Mijares, "Short-Term Production Optimization by Automated Adaptive Modeling and Control", SPE 112239-MS (2008).
42. A. Awasthi, S. Sankaran, M. **Nikolaou**, L. Saputelli, G. Mijares, "Meeting the Challenges of Real-Time Production Optimization—A Parametric Model-Based Approach", SPE 111853-MS (2008).
43. Darby, M. and M. **Nikolaou**, "Multivariable System Identification for Integral Controllability – Computational Issues", ADCHEM 2009, Instanbul, Turkey (2009).
44. Darby, M., M. Harmse, B. Froisy, and M. **Nikolaou**, "Model Predictive Control: Current Practice and Challenges", PLENARY talk, ADCHEM 2009, Instanbul, Turkey (2009).
45. M. **Nikolaou**, M. J. Economides, X. Wang, and M. Marongiu-Porcu, "Distributed Compressed Natural Gas Sea Transport" paper OTC-19738-MS, Offshore Technology Conference, Houston, TX 2009.

U.S. Well - Exhibit 2023
Liberty v. U.S. Well - IPR2025-00066
Page 12 of 23

46. Ø. Breyholtz, G. Nygaard, and M. **Nikolaou**, "Advanced Automatic Control for Dual-Gradient Drilling", paper SPE 124631, SPE Annual Technical Conference and Exhibition, New Orleans, 2009.
47. J. E. Gravdal, M. **Nikolaou**, Ø. Breyholtz, and L. A. Carlsen, "Improved Kick Management During MPD by Real-Time Pore-Pressure Estimation", paper SPE 124054-MS, SPE Annual Technical Conference and Exhibition, New Orleans, 2009.
48. Ø. Breyholtz, G. Nygaard, and M. **Nikolaou**, "Automatic Control of Managed Pressure Drilling", invited talk, American Control Conference, June 2010.
49. Ø. Breyholtz, G. Nygaard, H. Siahaan, M. **Nikolaou**, " Managed Pressure Drilling: A Multi-Level Control Approach", paper SPE 128151, Intelligent Energy, Amsterdam, March 2010.
50. Bhattacharya, S. and M. **Nikolaou** (2011a). "Optimal Fracture Spacing And Stimulation Design For Horizontal Wells In Unconventional Gas Reservoirs". SPE-147622-MS, SPE Annual Technical Conference and Exhibition. Denver, Colorado.
51. Bhattacharya, S. and M. **Nikolaou** (2011b). "Using Data From Existing Wells To Plan New Wells in Unconventional Gas Field Development". SPE-147658-MS, Canadian Unconventional Resources Conference. Calgary, Alberta.
52. Moridis, G. J., H. Kuzma-Anderson, M. T. Reagan, T. A. Blasingame, R. Santos, K. Boyle, C. M. Freeman, D. Ilk, Y. W. Wang, S. C. Pullman, S. Bhattacharya and M. **Nikolaou** (2011). "SeTES: A Self-Teaching Expert System for the Analysis, Design, and Prediction of Gas Production From Unconventional Gas Resources". SPE-149485-MS, Canadian Unconventional Resources Conference. Calgary, Alberta, Canada, 2011, SPE.
53. **Nikolaou**, M. "Computer-Aided Process Engineering in Oil and Gas production", Invited presentation at CPC VIII, Savannah, GA, Jan 2012.
54. Bravo, C. E., L. A. Saputelli, F. I. Rivas, A. G. Perez, M. **Nikolaou**, G. Zangl, N. d. Guzman, S. D. Mohaghegh and G. Nunez (2012). "State-of-the-Art Application of Artificial Intelligence and Trends in the E&P Industry: A Technology Survey". SPE-150314-MS, SPE Intelligent Energy International. Utrecht, The Netherlands, Society of Petroleum Engineers.
55. Saputelli L., Bravo C., **Nikolaou** M., Lopez C., Cramer R., Mochizuki T., Moricca G. (2013). "Best practices and lessons learned after 10 years of digital oilfield (DOF) implementations", SPE 167269.
56. **Nikolaou**, M, X Wang, and MJ Economides (2013) Optimization of Compressed Natural Gas Marine Transportation with Composite-Material Containers, SPE 165898-MS.
57. C. Wreden, J.T. Watters, R. Giroux, M. **Nikolaou**, K. Macfarlan, D.A. Richardson (2014) Deepwater Reverse-Circulation Primary Cementing: Applicability and Technical Path Forward for Implementation, OTC 25194-MS.
58. HB. Siahaan, EH Vefring, M **Nikolaou**, JE. Gravdal (2105). Evaluation of Coordinated Control During Back Pressure MPD Operations, Evaluation of Coordinated Control During Back Pressure MPD Operations, SPE 169205.
59. Y Lin, HY Wang, S He, M **Nikolaou**, (2015). Increasing Shale Gas Recovery through Thermal Stimulation: Analysis and an Experimental Study, SPE-175070-MS.
60. Supriya Gupta, Michael **Nikolaou**, Luigi Saputelli, Cesar Bravo (SEP 2016). ESP Health Monitoring KPI: A Real-Time Predictive Analytics Application. SPE 181009-MS, SPE Intelligent Energy International Conference and Exhibition.
61. Supriya Gupta, Luigi Saputelli, Michael **Nikolaou**, (SEP 2016). Applying Big Data Analytics to Detect, Diagnose, and Prevent Impending Failures in Electric Submersible Pumps, SPE 181510-MS, SPE Annual Technical Conference and Exhibition.

U.S. Well - Exhibit 2023
Liberty v. U.S. Well - IPR2025-00066
Page 13 of 23

62. Supriya Gupta, Luigi Saputelli, Michael **Nikolaou**, (OCT 2016). Big Data Analytics Workflow to Safeguard ESP Operations in Real-Time, SPE 181224-MS, SPE North America Artificial Lift Conference and Exhibition.
63. Alwarda, F., G. Liu, M. **Nikolaou** and C. Ehlig-Economides (2020). Automated Procedure for Quantifying ISIP And Friction Losses from Stage By Stage Hydraulic Fracture Treatment Falloff Data. SPE Annual Technical Conference and Exhibition, OnePetro.
64. Zeinali, L., C. Ehlig-Economides and M. **Nikolaou** (2021). Enhanced Geothermal System Model for Flow through a Stimulated Rock Volume. SPE Annual Technical Conference and Exhibition, OnePetro.

Papers at Technical Meetings without Conference Proceedings

Regular presenter annually at AIChE National Meetings (only abstracts required)

Other Publications (in Chronological Order)

1. M. J. Economides, and M. **Nikolaou**, "Energy: Facts and Myths", *Kathimerini*, (major Greek daily; in Greek), June 2009.
2. M. J. Economides, and M. **Nikolaou**, "Greece's great opportunity", *Kathimerini*, (major Greek daily; in Greek), April 2009.
3. Economides, M., N. Mitsos, and M. **Nikolaou**, "Natural Gas and Geopolitical Implications" (in Greek) *Philelefteros*, Cyprus daily, January 2011.
4. Economides, M., and M. **Nikolaou**, "The Future of Natural Gas in Cyprus" (in Greek), *O Politis (Citizen)*, Cyprus daily, October 2011.

Refereed Publications in Citation Order (Partial List of 12 most cited)
Full list at https://scholar.google.com/citations?user=mLs4L3UAAAAJ&hl=en&oi=ao
Google Scholar $\boxed{h = 42}$ (accessed 3/14/2023)

Publication	Citations	Year
RTO: An overview and assessment of current practice ML Darby, M Nikolaou, J Jones, D Nicholson Journal of Process control 21 (6), 874-884	355	2011
MPC: Current practice and challenges ML Darby, M Nikolaou Control Engineering Practice 20 (4), 328-342	338	2012
Chance-constrained model predictive control AT Schwarm, M Nikolaou AIChE Journal 45 (8), 1743-1752	336	1999
Model predictive controllers: A critical synthesis of theory and industrial needs M Nikolaou Academic Press 26, 131-204	203	2001
Robust stability analysis of constrained l_1-norm model predictive control H Genceli, M Nikolaou AIChE Journal 39 (12), 1954-1965	202	1993
Modelling time–kill studies to discern the pharmacodynamics of meropenem VH Tam, AN Schilling, M Nikolaou Journal of antimicrobial chemotherapy 55 (5), 699-706	152	2005
An approach to fault diagnosis of chemical processes via neural networks JY Fan, M Nikolaou, RE White AIChE Journal 39 (1), 82-88	146	1993
Self-learning reservoir management L Saputelli, M Nikolaou, MJ Economides SPE Reservoir Evaluation & Engineering 8 (06), 534-547	136	2005
Real-time reservoir management: A multiscale adaptive optimization and control approach L Saputelli, M Nikolaou, MJ Economides Computational Geosciences 10, 61-96	104	2006
State of the art of artificial intelligence and predictive analytics in the E&P industry: a technology survey C Bravo, L Saputelli, F Rivas, AG Pérez, M Nikolaou, G Zangl, ... Spe Journal 19 (04), 547-563	95	2014
Simultaneous constrained model predictive control and identification of DARX processes M Shouche, H Genceli, V Premkiran, M Nikolaou Automatica 34 (12), 1521-1530	89	1998
Design of robust constrained model-predictive controllers with volterra series H Genecili, M Nikolaou AIChE Journal 41 (9), 2098-2107	89	1995

Invited Seminars

Lawrence Berkeley National Laboratory, 1994.
U. of Texas, Austin, 1995.
U. of Massachusetts, Amherst, 1995.
Chemical Process Control Conference, Invited Talk, Tahoe City, 1996 (leading quinquennial international event on Chemical Process Control)
Northwestern University, 1995.
Rice University, 1996.
U. of Houston, 1995, 1997.
NSF/NIST Workshop, New Orleans, 1998.
NSF Workshop on Nonlinear Model Predictive Control, Ascona, Switzerland, 1998.
Texas Tech, Lubbock, TX, 2000.
Texas-Wisconsin Modeling & Control Consortium, Invited Talk, U. of Texas, Austin, 2001.
AspenWorld, Invited Talk, 2002.
"Advanced Computer Control of Chemical Processes: A Critical Overview of Historical and Technical Developments", AIChE South TX Section, January 2004.
"The Role of Academia" GEMI Workshop, April 3, 2003.
"Industry/University Collaborative Technology Development and Dissemination", Invited talk, AspenTech, 3/9/2004.
"Advanced Computer Control of Chemical Processes: A Critical Overview of Historical and Technical Developments", invited talk, AIChE South TX Section, 1/12/2004.
"Production Optimization: A Case for Intelligent Oilfield Operations", invited talk, ConocoPhillips, Houston, TX, 3/14/2005.
"Production Optimization: A Case for Intelligent Oilfield Operations", invited talk, Landmark Graphics, Houston, TX, 2/21/2005.
"Intelligent Oilfield Operations", invited talk, Pontifícia Universidade Católica do Rio de Janeiro, Brazil, 10/8/2004.
"A New Mathematical Modeling Approach to the Effect of Antimicrobial Agents to Heterogeneous Microbial Populations", Methodist Hospital Workshop, November 9, 2005.
"Modeling for making micro-chips, killing pathogens, and drilling hydrocarbon wells: Common themes & case studies", University of Oklahoma, October 20, 2005.
Distinguished Speaker, SPE FIRST ANNUAL EMERGING ENGINEERS CONFERENCE, Houston, TX, May 5, 2005.
"Systems, Control and Optimization" Workshop: Intelligent Wells – A Primer, University of Houston, August 30, 2006.
"Systems, Control and Optimization" Workshop: Instituto Colombiano del Petroleo, October 18, 2006.
" Control-Relevant Identification of Ill-Conditioned Multivariable Systems", ExxonMobil, Baytown, TX, March 8, 2007.
" A New Mathematical Modeling Approach to the Effect of Antimicrobial Agents on Microbial Populations of Distributed Resistance: Theory and Experiments", Mechanical Engineering Dept., UH, April 2007.
"Making the Business Case for Collaborative Technology Investment", Future Fields Summit, London, UK, May 9, 2007.
"Experience from Automation Technologies in Other Industries and Their Transfer to the Petroleum Industry", Real-Time Optimization Advanced Technical Workshop by SPE, Houston, TX, January 22, 2007.

U.S. Well - Exhibit 2023
Liberty v. U.S. Well - IPR2025-00066
Page 17 of 23

"Experience from Automation Technologies in Other Industries and Their Transfer to the Petroleum Industry", Drilling Workshop organized by the International Research Institute of Stavanger, Rice U., Houston, TX, May 7, 2008.

"Experience from Automation Technologies in Other Industries and Their Transfer to the Petroleum Industry", International Research Institute of Stavanger, Norway, June 1, 2008.

(KEYNOTE) "A Holistic View to Natural Gas Production", Risavika Natural Gas Center opening, Stavanger, Norway, August 25, 2008.

"Modeling: Art, Science and Engineering", University of British Columbia, Vancouver, Canada, March 19, 2009.

"Compressed Natural Gas: Present Status and Future Challenges", First Trondheim Gas Technology Conference", October 2009.

"Energy Geopolitics", ELIAMEP, Athens, Greece, May 2009.

"Control hierarchy for drilling automation", International Research Institute of Stavanger, Bergen, Norway, June 2009.

"Modeling: Art, Science, and Engineering", National Technical University, Athens, Greece, May 2009.

"Automation Avengers", ISA Annual Conference (education presentation to 600 HISD students), Houston, October 2009.

“Control system integration for offshore drilling operations”, invited presentation at International Research Institute of Stavanger, Bergen, Norway, June 2010.

“Corn Ethanol”, invited presentation, Celanese, Houston, TX, Dec. 2010**.**

“Modeling: Art, Science, and Engineering”, Imperial College, London, UK (June, 2011). (Invited lecture on the occasion of being External PhD Examiner).

“Improving Safety through Process Automation”, International Research Institute of Stavanger (IRIS) Bergen, Norway (2012).

“Liquefied Natural Gas”, Mare Forum, Pafos, Cyprus (2012).

"Monetizing Natural Gas: GTW, GTL, LNG, and CNG", Mare Forum, Pafos, Cyrpus (2013)

"Monetizing Natural Gas: GTW, GTL, LNG, and CNG", Mare Forum, Athens, Greece (2014)

"Intelligent Energy: The Synergy between Computers and Oil and Gas", Invited Talk, SINOPEC, Beijing, PRC, June 2016.

"Intelligent Energy: The Synergy between Computers and Oil and Gas", Invited Talk, Petroleum Engineering, UH, 2016.

"Intelligent Energy: Computer-Aided Solutions for Oil and Gas", Invited Talk, Petroleum Engineering, Texas A&M U., November 2016.

"Building Good Models for Model-Based Multivariable Controllers: Theory, Algorithms, and Case Studies", Invited Talk, Shell Technology Center, Houston, TX, June 2016.

"Intelligent Energy: Computer-Aided Solutions for Oil & Gas", **Keynote** talk, IPPTC, Beijing, PRC, 2017.

“Intelligent Energy: The Synergy between Computers and Oil & Gas”, Upstream Production Measurement Forum, Houston, TX – Invited Talk, 2018.

“Data-Driven Modeling for Production Optimization, SPE workshop: Smart integration in production system modeling”, Galveston, TX – Invited Talk, 2018.

“Data Analytics in Oil & Gas”, UH Energy webinar, 2020, https://www.youtube.com/watch?v=YsueMZ80gdc

(with M. Darby) “Data Analytics for the Process Industries”, UH Energy webinar, 2021, https://www.youtube.com/watch?v=nsfTvdMKoRc

“Data Analytics in Oil and Gas”, UH Energy presentation to HPE Pointnext Services, 2021.

Patents (in Chronological Order)

- Based on Sathish Sankaran's PhD Thesis, supervised by M. **Nikolaou**:
    - Economides, MJ; Deeg, WFJ; Valko, P; **Nikolaou**, M; and Sankaran, S, *System and Method for Stress and Stability Related Measurements In Boreholes*, US Patent No. 6,834,233 (2004).
    - Economides, MJ; Deeg, WFJ; Valko, P; **Nikolaou**, M; and Sankaran, S, *Method for Stress and Stability Related Measurements in Boreholes*, US Patent No. 7,006,918 (2006).
- Based on multiple grants for collaborative work between the two inventors:
    - Tam, V. H., and M. **Nikolaou**, *High-Throughput Screening For Antimicrobial Dosing Regimens*, US Patent No. 8,452,543 (2013).
- Based on Ankur Awasthi's PhD Thesis, supervised by M. **Nikolaou**:
    - Mijares, G; Garcia, A; Sankaran, S; Rodriguez, S; Saputelli, S; Awasthi, A; and **Nikolaou**, M, *Systems and Methods for Optimization of Real Time Production Operations*, US Patent No. 8,396,826 (2013).
    - Mijares, G., A. Garcia, S. Sankaran, J. Rodriguez, L. Saputelli, A. Awasthi and M. **Nikolaou** (2019). Systems and methods for optimization of real time production operations, US Patent 10,354,207.
- Based on Ajay Singh's PhD Thesis, supervised by M. **Nikolaou**:
    - Singh, AP; **Nikolaou**, M; Saputelli, L; Maucec, M, *Methods and Systems for Reservoir History Matching for Improved Estimation Of Reservoir Performance*, PCT/US2013/042711.
- Based on Supriya Gupta's MS Thesis, supervised by M. **Nikolaou**:
    - Gupta, S; M **Nikolaou**; C Bravo; L. Saputelli, *System And Method For Detecting, Diagnosing, And Correcting Trips or Failures of Electrical Submersible Pumps*, US Patent 11,078,774 (2021).
- Based on G. Luo's PhD Thesis, co-supervised by M **Nikolaou**
    - Provisional Patent Application (3/12/2019): UHID 2019-012 - UNIH-0162PRO (109293.162) - "Method And System For Enhanced Oil Recovery In Hydraulically Fractured Horizontal Wells" (with C. Economides and G. Luo)
- Based on J. Kesisoglou's PhD Thesis, supervised by M **Nikolaou**
    - **Nikolaou**, M., V. H. Tam and I. Kesisoglou (2023). OPTICAL BASED METHODS FOR DETERMINING ANTIMICROBIAL DOSING REGIMENS, US Patent App. 17/636,079.

FUNDED RESEARCH

Grants (in Chronological Order)

NSF, “Comprehensive Design Methodology for Nonlinear Controllers”, $55K (Initiation), 1990-1993.
Frito-Lay, “Control of Snack Food Processes”, $105,000, 1992-1994.
ARP, “Numerical Methods for Differential Equations with Wavelets”, $39,000, 1991-1993.
ATP-D, “Novel Control Methodology for Snack Food Extrusion Cooking”, $150,000, 1993-1996.
Frito-Lay, “Novel Control Methodology for Snack Food Extrusion Cooking”, $136,000, 1993-1996.
Shell Development, unrestricted, $20K/year + student summer support, 1992-1994 and 1997-2003.
DoE (through Lawrence Berkeley Lab), “Wavelets for Solution of Differential Equations Describing Underground Reservoir Two-Phase Flow”, $30,000, 1993-1994.
TXDoT (through TTI), “Traffic Air Pollution Effects of Elevated, Depressed, and at-Grade Level Freeways in Texas”, $100,000, 1993-1996.
Frito-Lay, unrestricted, $150,000, 1996-2000.
NSF, “Design of Model Predictive Control Systems with Enhanced Autonomy”, $180,000, 1997-2001.
Internal grants at Texas A&M University and UH.
Halliburton, “Development of a Novel Methodology for Stress and Stability Related Measurements in Boreholes”, $325,000, 1998-2000 (with M. Economides and P. Valko).
NSF/Lam Research Corporation, “A Study on Plasma Etching Yield Improvements through a Faculty-in-Industry Internship”, $58,000, 6-10/2001.
Lam Research Corporation, Unrestricted, $25,000/year, 2001-2003.
Kellogg Brown and Root, Unrestricted, $30,000+/year, 2001-2004; $40,000/year, 2006.
NSF, “Adaptive design of experiments for optimal uniformity in semiconductor manufacturing”, $340,000, 1/1/2003 – 12/31/2006 (CTS – 0227232) (with D. J. Economou).
American Chemical Society, Petroleum Research Fund, “A New Approach to High-Performance Drilling of Hydrocarbon Wells”, $80,000, 1/1/2004-8/31/2007.
Johns Hopkins, CAAT, “Development of a mathematical model to predict bacterial response to antimicrobial agents”, $18,000, 1/1/2005-12/31/2005.
eSimulation, Unrestricted, $20,000, 2006.
Landmark/Halliburton, "Real-time production optimization", $25,000, 1/1-31/12/2007.
Astra Zeneca, "Pharmacodynamics of antibiotics on resistant bacterial populations", $219,393 7/16/07 to 7/15/09 (with V. H. Tam),
National Science Foundation, “Development and experimental testing of a new approach to modeling the effect of antimicrobial agents on heterogeneous microbial populations”, $400,000, 1/1/2008-12/31/2010. (with V. H. Tam)
Research Partnership to Secure Energy for America (RPSEA), A Self-Teaching Expert System For The Analysis, Design And Prediction Of Gas Production From Shales, $753,060 for M. **Nikolaou** (~$3,000,000 project total).
Shell Global Solutions, “Analysis of Real-time optimization”, $124180, 9/1/2007-8/31/2009.
MaxWells, "Intelligent Drilling of Hydrocarbon Wells" Support for two visiting PhD students from International Research Institute of Stavanger (IRIS) Norway.
Unrestricted grant, Optima PowerWare, $44,000, 2009, 2011.
Unrestricted grant to Chemical & Biomolecular Engineering Dept. for one PhD student scholarship, Bayer Baytown, $90,000, 2008-2010.
RPSEA, “A Self-Teaching Expert System for the Analysis, Design, and Prediction of Gas Production From Unconventional Gas Resources”, $490,000, 2009-2011.
Halliburton, “Shale Oil and Gas Development”, $30,000, 2012.

U.S. Well - Exhibit 2023
Liberty v. U.S. Well - IPR2025-00066
Page 20 of 23

RPSEA, “Lowering Drilling Cost, Improving Operational Safety, and Reducing Environmental Impact Through Zonal Isolation Improvements for Horizontal Wells Drilled in the Marcellus and Haynesville Shales”, $255,000, 2012-2014.

RPSEA, “Deepwater Reverse-Circulation Primary Cementing”, $220,000, 2012-2015.

RPSEA, “Positive Annular Seal to Isolate Fresh Water Aquifers and Wellhead from Shale Hydrocarbon Contamination: Prevention of Fluid Migration and Remediation of Sustained Casing Pressure”, $227,000, 2013-2016.

National Institutes of Health (NIH), "Optimized Antimicrobial Combinations to Suppress Resistance" (1R56AI111793-01) $519,000, 2014-16 (with V. H. Tam).

GEAR, “A novel idea for treatment of persistent bacterial infections”, $30,000, 2017-2019 (with J. C. Conrad).

National Institutes of Health (NIH), “Personalized Antimicrobial Combinations to Combat Resistance”, $3,646,690, 2018-2022 (with V. H. Tam).

DOE, DE-FOA-0002525-GTO-Wells of Opportunity (WOO), $45,000/y for MN (multiple investigators)

SERVICE ACTIVITIES

University Service (in Chronological Order)

YEARS	DEPT./COLLEGE/UNIV.	COMMITTEE TITLE/PURPOSE
1993-1996	CoE, Texas A&M U.	EFAC (Engineering Faculty Advisory Committee)
1995-1997	Texas A&M U.	Council of Principal Investigators
1994-1997	Ch.E. Dept., Texas A&M	Undergraduate Curriculum Committee
1996-1997	Ch.E. Dept., Texas A&M	Graduate Curriculum Committee
1996-1997	Ch.E. Dept., Texas A&M	Web site team leader
1998-	CoE, UH	ABET Steering Committee
1999-2001	Ch.E. Dept., UH	Director of Graduate Studies
2001-2006	Ch.E. Dept., UH	AIChE Student Chapter Advisor
2002-2012	CoE, UH	Graduate Standards Committee
2002-2007	Ch.E. Dept., UH	MChE Program Director
2003-2007	CCoE, UH	Communications Committee
2003-2007	CCoE, UH	Computing Facilities Committee
2005-	Ch.E. Dept., UH,	ABET Outcomes Assessment Committee Chair,
2007-2008	Ch.E. Dept., UH	International ChE graduate student admissions
2007-2010	UH	Graduate and Professional Studies Council
2007-2010	UH	UH Teaching Excellence Awards Committee
2007-2012	UH	SACS Instructional Effectiveness Committee
2007-2010	Texas A&M	Advisory Board, ChE Curriculum Reform Project (NSF)
2005-2009	Process Technology Dept., Houston Community College, Advisory Board	
2011-2012	THECB Tuning Oversight Council for Engineering and Science (www.thecb.state.tx.us)	
2015-present	UH	GPSC in Faculty Senate
2017-2019	UH	ADVANCE Project Liaison, CcoE
2017-present	UH	MChE Program Director

Consulting (in Chronological Order)

Shell Development and Shell Oil, TX, 1990, 1993, 2001.
Frito-Lay Corporation, Dallas, TX, 1991-1997.
Bryan Research & Engineering, Bryan, TX, 1996.
General Electric, Houston, TX, 1998-present.
Simulation Sciences, Houston, TX, 1998.
Noble Drilling, Houston, TX, 2001-03.
Coral Energy, Houston, TX, 2002-03.
Lam Research, Fremont, CA, 2002.
Landmark Graphics, Houston, TX, 2005-06.
Intelligent Agent Corporation, Houston, TX 2006-09.
XGas, Houston, TX, 2008-present.
SABIC, Houston, TX, 2010.
Synergy Fluids, Houston, TX, 2012-2013.
Halliburton, Houston, TX, 2012.
Beirne, Maynard & Parsons, Houston, TX, 2012-2015.
EPT International, 2014-present.
Slider/Schlumberger, 2014.
M Whittaker, Houston, TX, 2015.
OJ Usoro, Houston, TX, 2016-2017.
Fish & Richardson, 2017-2021.
RotoSlide, 2014-present.

OTHER

Professional Affiliations

Society of Petroleum Engineers
American Institute of Chemical Engineers
Omega Chi Epsilon
Technical Chamber of Greece (Registered Engineer)

Foreign Languages

German (excellent)
Spanish & French (engineering material reading ability)
Greek (mother tongue)

Personal

US Citizen, married, two children

U.S. Well - Exhibit 2023
Liberty v. U.S. Well - IPR2025-00066
Page 23 of 23