

ID	Title	Authors	Acceptance Status
5	Cybersecurity in Process Control, Operations, and Supply Chain	Sandra Parker, Zhe Wu and Panagiotis Christofides	Invited
24	FEASIBILITY/FLEXIBILITY-BASED OPTIMIZATION FOR PROCESS DESIGN AND OPERATIONS	Huayu Tian, Jnana Sai Jagana, Qi Zhang and Marianthi Ierapetritou	Invited
41	Process operations: from models and data to digital applications	Constantinos C. Pantelides, Frances E. Pereira, Penelope J. Stanger and Nina F. Thornhill	Invited
45	Formulating data-driven surrogate models for process optimization	Ruth Misener and Lorenz Biegler	Invited
49	RESILIENT SUPPLY CHAINS – ROBUSTNESS AND DYNAMICS IN GLOBAL SUPPLY CHAINS	Ana Barbosa-Povoa and Jose Pinto	Invited
52	The Future of Control of Process Systems	Prodromos Daoutidis, Larry Megan and Wentao Tang	Invited
68	Integration of Chemical Process Operation with Energy and Systems Infrastructure	Jesus Flores-Cerrillo and Christopher Swartz	Invited
78	Circular Economy: Definitions, Challenges, and Opportunities	Styliani Avraamidou and Ana Torres	Invited
82	Future of Supply Chains: Challenges, Trends, and Prospects	Cristiana Lara and John Wassick	Invited
84	Open-Source Modeling Platforms	John Hedengren and Bethany Nicholson	Invited
97	Impact of Emerging Computing Architectures and Opportunities for Process Systems Engineering Applications	David Bernal, Carl Laird, Stuart Harwood, Dimitar Trenev and Davide Venturelli	Invited
110	Systems Engineering for Sustainability in a Globalized World: Resources, Ecosystems, Boundaries	Bhavik Bakshi and Christos Maravelias	Invited
115	HYPERSCALE MODELING: MOLECULE, PROCESS, ENTERPRISE	André Bardow and Ignacio Grossmann	Invited
116	DIGITAL TRANSFORMATION AND EXPANDING CAPABILITIES OF INDUSTRIAL PROCESS CONTROL AND OPTIMIZATION	Whit McConnell, Dimitrios Georgis, Tyler Soderstrom and Jitendra Kadam	Invited
117	FUTURE OF CO2 MANAGEMENT SYSTEMS: DESIGN AND OPERATIONS	David Miller	Invited
6	Physics-Informed Machine Learning Modeling for Model Predictive Control of Nonlinear Processes: An Overview of Recent Results	Yingzhe Zheng and Zhe Wu	Monday Poster
8	Statistical Machine Learning in Model Predictive Control of Nonlinear Processes: An Overview of Recent Results	Mohammed Alhajeri, Aisha Alnajdi, Zhe Wu and Panagiotis Christofides	Monday Poster
13	A NOVEL STOCHASTIC OPTIMIZATION SOFTWARE FOR THE OPTIMAL DESIGN OF CHEMICAL PROCESSES MODELED IN COMMERCIAL SIMULATION SOFTWARE	Fanyu Duanmu, Dian Ning Chia and Eva Sorensen	Monday Poster
15	MODEL PREDICTIVE CONTROL TUNING BY MONTE CARLO SIMULATION AND CONTROLLER MATCHING	Morten Ryberg Wahlgreen, John Bagterp Jørgensen and Mario Zanon	Monday Poster
20	Asymptotically Stable Economic Nonlinear Model Predictive Control without Pre-Calculated Steady-State Optimum	Kuan-Han Lin and Lorenz Biegler	Monday Poster
27	BAYESIAN OPTIMIZATION FOR AUTOMATIC TUNING OF MODEL PREDICTIVE CONTROLLERS	Leonardo Gonzalez and Victor Zavala	Monday Poster
30	Online Machine Learning Modeling and Predictive Control of Switched Nonlinear Systems: An Overview of Recent Results	Cheng Hu and Zhe Wu	Monday Poster
36	A REAL-TIME BASED APPROACH TO DISTILLATION CONTROL EDUCATION	Isuru A. Udugama, Michael A. Taube and Brent R. Young	Monday Poster
39	DATA-ENABLED EXPERIMENTAL DEVELOPMENT OF POLYMER-BASED ORGANIC ELECTRONICS	Aaron Liu, Rahul Venkatesh, Carson Meredith, Elsa Reichmanis and Martha Grover	Monday Poster
40	Digitalization and Control of an Experimental Electrochemical Reactor	Junwei Luo, Berkay Çıtmacı, Joon Baek Jang, Carlos Morales-Guio and Panagiotis Christofides	Monday Poster
46	Characterizing the pareto optimal trade-off between model-based information content and measurements cost	Jialu Wang and Alexander Dowling	Monday Poster
47	Optimizing Membrane Characterization using the DATA (Diafiltration Apparatus for high-Throughput Analysis) Framework	Xinhong Liu, Jonathan Ouimet, Laurianne Lair, William Phillip and Alexander Dowling	Monday Poster
51	Decision making with hybrid models under parameter and epistemic uncertainty: reactor optimization case study	Kyla Jones, Elvis Eugene and Alexander Dowling	Monday Poster
53	Plant wide steady state optimization using reinforcement learning	Kalpesh Patel and Gabriel Winter	Monday Poster
58	EXTENSION OF SIGN-PERTURBED SUMS METHOD TO MULTIVARIATE SYSTEMS	Masanori Oshima, Sanghong Kim, Yuri Shardt and Ken-Ichiro Sotowa	Monday Poster
64	Tracking Chemical Additive Releases in the Plastics End-Of-Life Management stage to close the loop	John D. Chea, Matthew Conway, Austin L. Lehr, Gerardo J. Ruiz-Mercado and Kirti M. Yenkie	Monday Poster
69	ADVANCED MPC FOR LARGE SCALE DYNAMIC SYSTEMS BASED ON MODEL REDUCTION TECHNIQUE AND FEEDFORWARD ARTIFICIAL NEURAL NETWORK	Weiguo Xie	Monday Poster
73	Approximation of Nonlinear Model Predictive Control Using Mixture Density Networks	Morimasa Okamoto, Jiayang Ren, Qiangqiang Mao and Yankai Cao	Monday Poster
75	INTERPRETABLE QSAR MODEL FOR HEALTH RISK ASSESSMENT OF HAZARDOUS CHEMICAL BASED ON STRUCTURE-TO-TOXICITY TRANSFORMER	SangYoun Kim, Shahzeb Tariq, SungKu Heo, ChanHyeok Jeong, MinHyeok Shin, TaeYong Woo and Chang	Monday Poster
83	Bidirectional Inventory Control With Optimal Use Of Intermediate Storage And Minimum Flow Constraints	Lucas Ferreira Bernardino and Sigurd Skogestad	Monday Poster
96	Evaluating solution performance under uncertainty in superstructure optimization	Julia Granacher, Rafael Castro-Amoedo, Ivan Daniel Kantor and François Maréchal	Monday Poster
98	MIXED-INTEGERS QUADRATIC OPTIMIZATION USING QUANTUM COMPUTING FOR PROCESS APPLICATIONS	Ashfaq Iftakher, Monzure-Khoda Kazi and M. M. Faruque Hasan	Monday Poster
99	Reconfiguration in the model predictive control of numbered-up modular facilities	Yi Dai and Andrew Allman	Monday Poster
104	A PREDICTIVE MODEL FOR IN-SITU MONITORING OF MOLECULAR WEIGHT OF COPOLYMERS USING SPECTROSCOPIC METHODS	Tung Nguyen, Ahmad Shamsabadi and Mona Bavarian	Monday Poster
105	Model-based control algorithms for the quadruple tank system: An experimental comparison	Anders H. D. Andersen, Tobias K. S. Ritschel, Steen Hørsholt, Jakob Kjøbsted Huusom and John Bagterp Jørgensen	Monday Poster
106	State Estimation for Continuous-Discrete-Time Nonlinear Stochastic Systems	Marcus Krogh Nielsen, Tobias K.S. Ritschel, Ib Christensen, Jess Dragheim, Jakob Kjøbsted Huusom, Kristian	Monday Poster
108	Progressive relaxations for efficient determination of conservative design spaces	Daniel Laky, Michael Bynum, Shankar Vaidyaraman, Salvador García Muñoz and Carl Laird	Monday Poster
109	A Partial Multiparametric Programming method for Model Predictive Control	Dustin Kenefake, Sahithi Akundi and Efstratios Pistikopoulos	Monday Poster
1	Oil Production Under Gas-Coning Conditions by Well-Cycling and Mixed-Integer Programming	Jose Santiago Rodriguez, Abhishek Mishra, Keith Zorn and Francisco Trespalacios	Oral
2	Automatic Decomposition of Large-scale Industrial Processes for Distributed MPC on the Shell-Yokogawa Platform for Advanced Control and Estimation (PACE)	Wentao Tang, Pierre Carrette, Yongsong Cai, John Williamson and Prodromos Daoutidis	Oral
3	SIMULTANEOUS DESIGN AND OPERATIONAL OPTIMIZATION FOR FLEXIBLE CARBON CAPTURE PLANTS	Kyeongjun Seo, Adhika P. Retnanto, Jorge L. Martorell, Mark A. Stadtherr, Thomas F. Edgar and Michael F.	Oral
7	Data-based modeling and control of nonlinear process systems using sparse identification: an overview of recent results	Fahim Abdullah, Zhe Wu and Panagiotis Christofides	Oral
9	LEARNING TO INITIALIZE GENERALIZED BENDERS DECOMPOSITION VIA ACTIVE LEARNING	Ilias Mitrai and Prodromos Daoutidis	Oral
11	SEAMLESS IMPLEMENTATION OF A NOVEL VALVES STICTION DETECTION ALGORITHM USING SEEQ DATA LAB	Timothy Essinger, Ashwin Venkat and Margret Bauer	Oral
12	Data-Driven Distributionally Robust Optimization for Long-Term Contract vs. Spot Allocation Decisions	Dimitri Papageorgiou	Oral
14	TOWARDS A DIGITAL TWIN FOR ANALYTICAL HPLC	Monica Tirapelle, Maximilian Besenhard, Luca Mazzei, Jinsheng Zhou, Scott Andrew Hartzell and Eva Sorro	Oral
16	Surrogate-based Optimization of a Flexible Integrated Biorefinery	Yuqing Luo and Marianthi Ierapetritou	Oral
17	TOWARDS OPTIMAL ENERGY-WATER SUPPLY SYSTEM OPERATION FOR AGRICULTURAL AND METROPOLITAN ECOSYSTEMS	Marcello Di Martino, Patrick Linke and Efstratios N. Pistikopoulos	Oral
18	An application of the Dulmage-Mendelsohn partition to the analysis of a discretized dynamic chemical looping reactor model	Robert Parker, Chinedu Okoli, Bethany Nicholson, John Sirola and Lorenz Biegler	Oral
22	Handling Interactive Systems in Primal-Dual Feedback-optimizing Control	Risvan Dirza and Sigurd Skogestad	Oral
25	REAL-TIME CHARACTERIZATION OF MIXED PLASTIC WASTE USING MACHINE LEARNING AND INFRARED SPECTROSCOPY	Shengli Jiang and Victor Zavala	Oral
28	CO-OPTIMIZING DESIGN AND OPERATION STRATEGY OF SOLID OXIDE FUEL CELL-BASED HYDROGEN-ELECTRICITY COPRODUCTION SYSTEMS	Nicole P. Cortes, John C. Eslick, Alexander Noring, Naresh Susarla, Chinedu Okoli, Miguel A. Zamarripa, Ar	Oral
29	Data-Driven Model Reduction and Nonlinear Model Predictive Control of an Air Separation Unit by Applied Koopman Theory	Jan C. Schulze, Danimir T. Doncevic, Nils Erwes and Alexander Mitsos	Oral
31	Multi-period fair customer allocation in oligopolies	Asimina Marousi, Jose M. Pinto, Lazaros Papageorgiou and Vassilis Charitopoulos	Oral
34	Recent Advances in Discrete Time Chemical Production Scheduling MILP Models	Nathan Adelgren, Amin Samadi and Christos Maravelias	Oral
35	BRIDGING THE SCALES FROM CATALYST SYNTHESIS TO SUSTAINABLE PROCESSES: CO2 HYDROGENATION TO METHANOL	Lukas A. Spiekermann, Thaylan Pinheiro Araujo, Jan M. Seiler, Javier Pérez-Ramírez and André Bardow	Oral
37	AN INDUSTRIAL CASE STUDY ON THE COMBINED IDENTIFICATION AND OFFSET-FREE MODEL PREDICTIVE CONTROL OF A CHEMICAL PROCESS	Steven J. Kuntz, James J. Downs, Stephen M. Miller and James B. Rawlings	Oral

38	ABSOLUTE LIFE CYCLE OPTIMIZATION OF THE CDR-POWER NEXUS	Valentina Negri, Sebastian H. Klukowski, Daniel Vázquez and Gonzalo Guillén-Gosálbez	Oral
42	Characterizing Event Constraints with Generalized Disjunctive Programming	Joshua L Pulsipher, Daniel Ovalle, Hector D Perez, Carl D Laird and Ignacio E Grossmann	Oral
44	Efficient Multi-Echelon Inventory Optimization Models for Industrial Practice	Victoria G. Achkar, Braulio B. Brunaud and Ignacio E. Grossmann	Oral
56	COMPUTATIONAL PERFORMANCE OF ALGEBRAIC MODELING LANGUAGES WITH ALTERNATE SOLVER INTERFACES AND ADVANCED MODELING COMPONENTS	Bashar Ammari, Merve Merakli, Sai Kompalli, Yufeng Qian, Joshua Pulsipher, Michael Bynum, Kevin Furr	Oral
59	A GAUSSIAN PROCESS EMBEDDED FEATURE SELECTION METHOD BASED ON AUTOMATIC RELEVANCE DETERMINATION	Yushi Deng, Mario Eden, Shuxing Cheng, Haijing Gao and Selen Cremaschi	Oral
60	Operation Optimization of Supply Chain Networks Under Disruptions	Daniel Ovalle, Yixin Ye, Kyle Harshbarger, Scott Bury, John M. Wassick, Carl D. Laird and Ignacio E. Grossmann	Oral
61	NMPC for Setpoint Tracking Operation of a Solid Oxide Electrolysis Cell System	Douglas Allan, Vibhav Dabaghao, Mingrui Li, John Eslick, Jinliang Ma, Debangsu Bhattacharyya, Stephen	Oral
62	A Conditional Value-at-Risk Framework For Optimal Microgrid Day-Ahead Market Bidding	Robert Herding, Emma Ross, Wayne R. Jones, Vassilis M. Charitopoulos and Lazaros G. Papageorgiou	Oral
63	Enhanced CNN with Global Features for Fault Diagnosis of Complex Chemical Processes	Qiugang Lu and Saif Al-Wahaibi	Oral
71	Dynamic objective correlation in many-objective optimal operation: An ammonia production case study	Andrew Allman and Justin Russell	Oral
72	Applied Topology and Geometry in Process Monitoring and Fault Detection	Alexander Smith and Victor Zavala	Oral
74	Shared Parameter Network: An efficient process monitoring model	Lucky Yerimah, Sambit Ghosh and B. Wayne Bequette	Oral
76	Stochastic programming of energy system operations considering terminal energy storage levels	Teemu J Ikonen, Dongho Han, Jay H Lee and Iiro Harjunkoski	Oral
79	Application of grey-box modeling for system health monitoring in manufacturing	Ustav Awasthi and George M. Bollas	Oral
80	Improving Moving Horizon Estimation using Parametric Nonlinear Programming Sensitivities	Simen Bjorvand and Johannes Jäschke	Oral
85	Optimization-based Approaches for Design of Chemical Process Families Using ReLU Surrogates	Georgia Stinchfield, Lorenz Biegler, John Eslick, Clas Jacobson, David Miller, John Sirola, Miguel Zamarrip	Oral
87	Opportunities for Industrial Demand Response: A Survey of Grid-Responsive Smart Manufacturing Applications	Blake Billings and Kody Powell	Oral
88	A data-driven random walk approach for solving water flow dynamics in soil systems	Zeyuan Song and Zheyu Jiang	Oral
89	A RISK-BASED REINFORCEMENT LEARNING ALGORITHM TO IMPROVE ACUTE RENAL REPLACEMENT THERAPY	Brian McLaverty, Annabelle Lint, Gilles Clermont and Robert Parker	Oral
90	Automatic Source Code Generation of Complicated Models For Deterministic Global Optimization With Parallel Architectures	Robert Gottlieb, Pengfei Xu and Matthew Stuber	Oral
91	Bilevel optimization of energy system transition pathways considering competition in markets	David Yang Shu, Christiane Reinert, Jacob Mannhardt, Ludger Leenders, Jannik Lühje, Alexander Mitsos	Oral
93	Dynamic Risk-based Design and Explicit Model Predictive Control via Multi-Parametric Programming	Moustafa Ali, Xiaoqing Cai, Faisal Khan and Yuhe Tian	Oral
94	CARBON EMISSION TRADING ON THE BLOCKCHAIN: A GAME-THEORETIC FRAMEWORK	Monzure-Khoda Kazi and M.M. Faruque Hasan	Oral
95	Safe deployment of reinforcement learning using deterministic optimization of trained neural networks	Radu Burtea and Calvin Tsay	Oral
100	Implementing adjoint subgradient evaluation for use in global dynamic optimization	Yulan Zhang and Kamil Khan	Oral
101	A Multiperiod Model for Portfolio Optimization of Carbon Capture and Utilization	Pooja Zen Santhamoorthy, Hariprasad Subramani and Selen Cremaschi	Oral
102	A Bayesian Optimization Approach for Data-Efficient Flexibility Analysis of Expensive Black-Box Models	Akshay Kudva and Joel Paulson	Oral
107	PERSPECTIVES ON DESIGN CONSIDERATIONS INSPIRED BY SECURITY AND QUANTUM TECHNOLOGY IN CYBERPHYSICAL SYSTEMS FOR PROCESS ENGINEERING	Helen Durand, Jihan Abou Haloun, Kip Nieman and Keshav Kasturi Rangan	Oral
113	A Modeling and Closed-Loop Planning Strategy to Achieve Net-Zero Energy Use in Buildings	Michael Risbeck, Chenlu Zhang, Saman Cyrus and Young Lee	Oral
10	DEVELOPING STRATEGIES FOR POLYMER REDESIGN AND RECYCLING USING REACTION PATHWAY ANALYSIS	Linda Broadbelt, Gorugantu SriBala, Rebecca Harmon, Eugene Chen, Changxia Shi, Matthew Coile, Sai Ph	Plenary
70	The quest towards the integration of process control, process operations and process operability – Industrial need or academic curiosity?	Efstathios Pistikopoulos	Plenary
114	Power Systems of the Future	Ernst Scholtz and Alexandre Oudalov	Plenary
118	Harmonizing the use of optimization and feedback in process operations and control	James Rawlings and Robert McAllister	Plenary
119	Innovating for Speed, Complexity and Sustainability in Pharmaceutical Development and Manufacturing	Celia Cruz	Plenary
120	Continuous monitoring for measuring and mitigating methane emissions from oil and gas production operations	David Allen	Plenary
4	THE FUTURE OF THE CHEMICAL INDUSTRY SHAPED BY GLOBAL CONFLICTS: IMPACT OF MAJOR LNG EXPORTS ON THE U.S. CHEMICAL INDUSTRY	Alkiviadis Skouteris, Ioannis Giannikopoulos, David T. Allen, Michael Baldea and Mark A. Stadtherr	Wednesday Poster
19	OPTIMAL DESIGN OF SUPPLY CHAIN FOR PLASTIC UPCYCLING CONSIDERING ECONOMIC AND ENVIRONMENTAL INDICATORS	Oluwadare Badejo, Borja Hernandez and Marianthi Ierapetritou	Wednesday Poster
21	Environmental and Economic Analysis of the Polyethylene Terephthalate Production from Biomass-based p-Xylene	Yuan Liu, Yuqing Luo, Aikaterini Anastasopoulou and Marianthi Ierapetritou	Wednesday Poster
23	Heuristic Dynamic Ramping Constraints for Demand Response of Processes with Internal Dynamics	Florian Joseph Baader, André Bardow and Manuel Dahmen	Wednesday Poster
26	PRICING AND REMUNERATING LOAD SHIFTING FLEXIBILITY IN ELECTRICITY MARKETS	Weiqi Zhang and Victor Zavala	Wednesday Poster
32	MUNICIPAL SOLID WASTE MANAGEMENT USING A COORDINATED MARKET FRAMEWORK	Aurora Munguia-Lopez, Victor Zavala and Jose Maria Ponce-Ortega	Wednesday Poster
33	TECHNO-ECONOMIC EVALUATION OF INFRASTRUCTURES FOR THERMOCHEMICAL UPCYCLING OF PLASTIC WASTE	Jiaze Ma, Philip Tominac and Victor Zavala	Wednesday Poster
48	LIFE CYCLE OPTIMIZATION OF POWER GENERATION AND TRANSMISSION EXPANSION PLANNING	Iasonas Ioannou, Ignacio Grossmann and Gonzalo Guillén-Gosálbez	Wednesday Poster
50	DISTRIBUTED MANUFACTURING FOR ELECTRIFIED CHEMICAL PROCESSES IN A MICROGRID	Asha Ramanujam and Can Li	Wednesday Poster
54	Integrating CO2 mineralization in industrial clusters: the benefits of material and heat integration	Rafael Castro-Amoedo, Mouhannad Abou Daher, Julia Granacher and Francois Marechal	Wednesday Poster
55	A Shortcut Model for Multicomponent Homogeneous Azeotropic Distillation	Zheyu Jiang	Wednesday Poster
57	APPLICATION OF DISCRETIZED NON-LINEAR PROGRAMMING TO MINIMIZE MIXED OIL FORMATION IN FLUSHING OPERATIONS OF LUBRICANT PIPELINES	Swapana Jerpoth, Robert Hesketh, Stewart Slater, Robert McClernan, Mariano Savelski and Kirti Yenkie*	Wednesday Poster
65	Artificial Intelligence for Improving Process Control in Energy Efficiency Perspective: A Review	Mohamed El Koujok and Mouloud Amazouz	Wednesday Poster
66	SYSTEMATIC DESIGN AND ANALYSIS OF SOLVENT ASSISTED PLASTIC RECYCLING PROCESSES	Austin L. Lehr, Matthew Conway, Kayla L. Heider, Emmanuel A. Aboagye, John D. Chea, Jake P. Stengel, P	Wednesday Poster
67	Process alternatives to stabilize small-scale ammonia production	George Bollas and Laron Burrows	Wednesday Poster
77	XAI-ASSISTED MULTI-AGENT DEEP REINFORCEMENT LEARNING FOR A GUARANTEED AUTONOMOUS CONTROL SYSTEM OF SEQUENCING BATCH REACTOR FOR SUSTAINABLE	SungKu Heo, TaeYong Woo, SangYoun Kim and ChangKyo0 Yoo	Wednesday Poster
81	A FRAMEWORK FOR THE EVALUATION OF THE CIRCULARITY OF PLASTIC WASTE MANAGEMENT SYSTEMS: A CASE STUDY ON MECHANICAL RECYCLING OF HDPE	Elizabeth Chialdikas, Aurora del C. Munguia-Lopez, Horacio Aguirre-Villegas and Styliani Avraamidou	Wednesday Poster
86	Demand Bidding Models for Chemical Processes: Conceptual Framework and a Chlor-Alkali Optimal Power Flow Example	Xin Tang, Elaine Hale, Richard O'Neill, Ross Baldick and Michael Baldea	Wednesday Poster
103	EMBEDDING ADVANCED WASTEWATER TREATMENT TECHNOLOGY MODELS INTO P-GRAPH FRAMEWORK	Emmanuel Aboagye, Jean Pimentel, Akos Orosz, Mihaly Markot, Heriberto Cabezas, Ferenc Friedler and K	Wednesday Poster
111	ADVANCED OPTIMIZATION OF MULTI-SINK CO2-EOR OPERATIONS IN THE CONTEXT OF LONG-TERM CCUS SUPPLY CHAIN DESIGN	Agustin Francisco Montagna, Javier D. Angarita, Alexa E. Duarte, Ariel Uribe, Juan Pablo Osorio, C. Gouna	Wednesday Poster
112	A framework for reliability-embedded design of multi-scale energy systems	Rahul Kakodkar, Natasha J. Chrisandina, Mahmoud M. El-Halwagi and Efstathios N. Pistikopoulos	Wednesday Poster