PSE 2021+ KYOTO

Program at glance

as of 2 May 2022

Contents

Program 19 June 2022	1
Program 20 June 2022	2
Program 21 June 2022	3
Program 22 June 2022	4
Program 23 June 2022	5
Oral sessions details 20 June 2022	6
Poster session details 20 June 2022	9
Oral sessions detail 21 June 2022	13
Poster session details 21 June 2022	16
Oral sessions details 22 June 2022	20
Poster session details 22 June 2022	24
Oral sessions detail 23 June 2022	28

Japan Std. Time	Sunday, 19 June
	Main Hall
15:00-20:00	Registration
17:00-18:30	Christodoulos A. Floudas Distinguished Lectureship sponsored by the Elsevier journal Computers & Chemical Engineering Ignacio E. Grossman *Optimal Synthesis and Planning of Sustainable Chemical Processes and Energy Systems*
18:30-20:00	Welcome Reception (at a different location)

PSE 2021+ KYOTO

Program at glance

as of 2 May 2022

Japan Std. Time	Monday, 20 June			
	Main Hall	Hall I	Hall II	Hall III
9:30-9:50	Opening			
09:50-10:40	Plenary 1 Yoshihiko Hamamura *Actions toward Carbon-Neutral Society with Fuel Cell Technology*			
10:40-10:55	Break			
10:55-13:00	Process and Product Design/ Synthesis (1) 11,12,13 (11:55-12:00 break) 14,15,16	Process Dynamics and Control (1) 56,57,58 (11:55-12:00 break) 59,60,61	Cyber-Physical Systems and Security 242,243,244 (11:55-12:00 break) 245,246,247	Energy, Food and Environmental Systems (1) 308,309,310 (11:55-12:00 break) 311,312,313
13:00-14:00	Lunch			
14:00-15:30	**On-site poster: 14:00-15:30 JST** and/or On-line poster: 22:30-23:30 JST **On-site poster venue: International Science Innovation Bldg.** Process and Product Design/Synthesis Process Dynamics and Control Cyber-Physical Systems and Security Energy, Food and Environmental Systems 31-55,69-74,248-251,333-353 (56)			
15:30-15:40	Break			
15:40-16:20	Keynote 1 Ruth Misener *Optimization formulations for machine learning surrogates*	Keynote 2 Jongmin Lee *Q-MPC: Integration of Reinforcement Learning and Model Predictive Control for Safe Learning*		
16:20-16:35	Break			
16:35-19:00	Process and Product Design/ Synthesis (2) 17,18,19 (17:35-17:40 break) 20,21,22,23	Process Dynamics and Control (2) 62,63,64 (17:35-17:40 break) 65,66,67,68	Supply Chain Management and Logistics 91,92,93 (17:35-17:40 break) 94,95,96,97	Energy, Food and Environmental Systems (2) 314,315,316 (17:35-17:40 break) 317,318,319,320
19:00-22:30	Break			
22:30-23:30	On-site poster: 14:00-15:30 JST and/or **On-line poster: 22:30-23:30 JST** **On-line poster at: oVice** Process and Product Design/Synthesis Process Dynamics and Control Cyber-Physical Systems and Security Energy, Food and Environmental Systems 31-55,69-74,248-251,333-353 (56)			

PSE 2021+ KYOTO

Program at glance

as of 2 May 2022

Japan Std. Time	Tuesday, 21 June			
	Main Hall	Hall I	Hall II	Hall III
6:00-7:00	On-site poster: 14:00-15:30 JST and/or **On-line poster: 6:00-7:00 JST** **On-line poster at: oVice** Machine Learning and Big Data Scheduling and Planning Supply Chain Management and Logistics Process Intensification Integration of Process Operations and Design/Synthesis 82-90,98-105,111-116,129-134,278-307 (59)			
7:00-9:30	Break			
9:30-10:20	Plenary 2 Rqfiqul Gani *Challenges and Opportunities for Process Systems Engineering in a Changed World*			
10:20-10:35	Break			
10:35-13:00	Machine Learning and Big Data (1) 252,253,254 (11:35-11:40 break) 255,256,257,258	Scheduling and Planning 75,76,77 (11:35-11:40 break) 78,79,80,81	Process and Product Design/ Synthesis (3) 24,25,26 (11:35-11:40 break) 27,28,29,30	Integration of Process Operations and Design/ Synthesis (1) 117,118,119 (11:35-11:40 break) 120,121,122,123
13:00-14:00	Lunch			
14:00-15:30	**On-site poster: 14:00-15:30 JST** and/or On-line poster: 6:00-7:00 JST **On-site poster venue: International Science Innovation Bldg.** Machine Learning and Big Data Scheduling and Planning Supply Chain Management and Logistics Process Intensification Integration of Process Operations and Design/Synthesis 82-90,98-105,111-116,129-134,278-307 (59)			
15:30-15:40	Break			
15:40-17:20	Machine Learning and Big Data (2) 259,260,261,262,263	Process Intensification 106,107,108,109,110	Energy, Food and Environmental Systems (3) 321,322,323,324,325	Integration of Process Operations and Design/ Synthesis (2) 124,125,126,127,128
	Banquet (at a different location)			

PSE 2021+ KYOTO

Program at glance

as of 2 May 2022

Wednesday, 22 June

Japan Std. Time	Main Hall	Hall I	Hall II	Hall III
9:30-10:20	Plenary 3 Marianthi Ierapetritou *PSE Tools and Challenges in the Development of Advanced Pharmaceutical Manufacturing*			
10:20-10:35	Break			
10:35-13:00	Pharma and Healthcare Systems (1) 354,355,356 (11:35-11:40 break) 357,358,359,360	Machine Learning and Big Data (3) 264,265,266 (11:35-11:40 break) 267,268,269,270	Modeling, Analysis and Simulation (1) 135,136,137 (11:35-11:40 break) 138,139,140,141	Optimization Methods and Computational Tools (1) 188,189,190 (11:35-11:40 break) 191,192,193,194
13:00-14:00	Lunch			
14:00-15:30	**On-site poster: 14:00-15:30 JST** and/or On-line poster: 22:30-23:30 JST **On-site poster venue: International Science Innovation Bldg.** Pharma and Healthcare Systems Process Monitoring and Safety Modeling, Analysis and Simulation Optimization Methods and Computational Tools 156-187,209-220,228-241,368-371 (62)			
15:30-15:40	Break			
15:40-16:20	Keynote 3 Hirokazu Sugiyama *Pharma PSE: a multiscale approach for reimagining pharmaceutical manufacturing*	Keynote 4 Raghunathan Rengasamy *Artificial Intelligence and Process Systems Engineering*		
16:20-16:35	Break			
16:35-19:00	Pharma and Healthcare Systems (2) 361,362,363 (16:35-16:40 break) 364,365,366,367	Process Monitoring and Safety 221,222,223 (16:35-16:40 break) 224,225,226,227	Modeling, Analysis and Simulation (2) 142,143,144 (16:35-16:40 break) 145,146,147,148	Optimization Methods and Computational Tools (2) 195,196,197 (16:35-16:40 break) 198,199,200,201
19:00-22:30	Break			
22:30-23:30	On-site poster: 14:00-15:30 JST and/or **On-line poster: 22:30-23:30 JST** **On-line poster at: oVice** Pharma and Healthcare Systems Process Monitoring and Safety Modeling, Analysis and Simulation Optimization Methods and Computational Tools 156-187,209-220,228-241,368-371 (62)			

PSE 2021+ KYOTO

Program at glance

as of 2 May 2022

Japan Std. Time	Thursday, 23 June			
	Main Hall	Hall I	Hall II	Hall III
9:30-10:10	Keynote 5 Yasunori Kikuchi *Application of PSE into social changes: biomassbased production, recycling systems, and regional systems design and assessment*	Keynote 6 Selen Cremaschi *Surrogate Modeling and Surrogate-Based Optimization with Stochastic Simulations*		
10:10-10:20	Break			
10:20-11:20	Energy, Food and Environmental Systems (4) 326,327,328	Modeling, Analysis and Simulation (3) 149,150,151	Optimization Methods and Computational Tools (3) 202,203,204	Machine Learning and Big Data (4) 271,272,273
11:20-12:20	Lunch			
12:20-13:40	Energy, Food and Environmental Systems (5) 329,330,331,332	Modeling, Analysis and Simulation (4) 152,153, 154, 155	Optimization Methods and Computational Tools (4) 205,206,207,208	Machine Learning and Big Data (5) 274,275,276,277
13:40-13:50	Break			
13:50-14:40	Plenary 4 Iftekhar Karim *Experience and Perspectives on our Journey towards Deep Decarbonization*			
14:40-15:00	Closing			

Session	#	Authors	Title
Process and Product Design/ Synthesis (1) 11,12,13,14,15,16	11	George Stephanopoulos, Bhavik Bakshi and George Basile	Reinventing the Chemical/Materials Company: Transitioning to a Sustainable Circular Enterprise
	12	Nikolaus I. Vollmer, Gürkan Sin and Krist Gernaey	Value Chain Optimization of a Xylitol Biorefinery with Delaunay Triangulation Regression Models
	13	Stefanie Kaiser and Sebastian Engell	Evaluating the Impact of Model Uncertainties in Superstructure Optimization to Reduce the Experimental Effort
	14	Wenlong Wang, Qilei Liu, Lei Zhang, Yachao Dong and Jian Du	Retrosynthesis Pathway Design Using Hybrid Reaction Templates and Group Contribution-Based Thermodynamic Models
	15	Chen Zhang, Clas Jacobson, Qi Zhang, Lorenz Biegler, John Eslick, Miguel A. Zamarripa, David Miller, Georgia Stinchfield, John Siirola and Carl Laird	Optimization-based Design of Product Families with Common Components
	16	Semie Kim and Young-il Lim	Economic evaluation and analysis of electricity and nano-porous silica productions from rice husk
Process Dynamics and Control (1) 56,57,58,59,60,61	56	Sophie Sitter, Damien van de Berg, Max Max Mowbray, Antonio del Rio-Chanona and Panagiotis Petsagkourakis	Convex Q-learning: Reinforcement learning through convex programming
	57	Hyein Jung, Jong Woo Kim and Jong Min Lee	Differential dynamic programming approach for parameter dependent system control
	58	Masaharu Daiguji and Yoshiyuki Yamashita	Optimization of an air-cooler operation in an industrial distillation column
	59	San Dinh and Fernando Lima	Dynamic Operability Analysis for the Calculation of Transient Output Constraints of Linear Time-Invariant Systems
	60	Masanori Oshima, Sanghong Kim, Yuri Shardt and Ken-Ichiro Sotowa	Effective Re-identification of Multivariate Process under Model Predictive Control Using Information from Plant-Model Mismatch Detection
	61	Zhen-Feng Jiang, Xi-Zhan Wei, Jia-Lin Kang, David Shan-Hill Wong, Yuan Yao, Yao-Chen Chuang, Shi-Shang Jang and John Di-Yi Ou	Model Predictive Control of Grade Transition with Attention Base Sequence-to-Sequence Model
Cyber-Physical Systems and Security 242,243,244,245,246,247	242	Shilpa Narasimhan, Nael H. El-Farra and Matthew Ellis	Cyberattack Detectability-Based Controller Design for Multiplicative Sensor-Controller Attacks
	243	Toshiaki Honda, Takashi Hamaguchi and Yoshihiro Hashimoto	OPC UA information transfer via unidirectional data diode for ICS cyber security
	244	Takanori Miyoshi, Isao Kato, Shota Shimizu, Kanata Nishida and Masato Izawa	Study on Device Authentication System for Dynamic Zoning of Industrial Control Systems
	245	Yuitaka Ota, Haruna Asai, Shiho Taniuchi, Erika Mizuno, Tomomi Aoyama, Yoshiro Hashimoto and Ichiro Koshijima	Designing Framework for Tabletop Exercise to Promote Resilience Against Cyber Attacks
	246	Mohammed Aatif Shahab, Babji Srinivasan and Rajagopalan Srinivasan	Self-Organizing Map Based Approach for Assessment of Control Room Operator Training
	247	Yongbeom Shin, Jongyeon Oh, Dongkuk Jang and Dongil Shin	Digital Twin of Alkaline Water Electrolysis Systems for Green Hydrogen Production

Session	#	Authors	Title
Energy, Food and Environmental Systems (1) 308,309,310,311,312,313	308	Victor Moretti, Celma O. Ribeiro, Claudio A. O. Nascimento, Alison Fairbrass and Julia Tomei	Emission and mitigation of CO2 and CH4 produced by cattle: a case study in the Brazilian Pantanal
	309	Edgar Martin-Hernandez, Yicheng Hu, Victor M. Zavala, Mariano Martin and Gerardo J. Ruiz-Mercado	Promoting phosphorus recovery at livestock facilities in the Great Lakes region: Analysis of incentive policies
	310	Luis David Servian-Rivas, Ismael Diaz, Manuel Rodriguez, Emilio J. Gonzalez and Maria Gonzalez-Miquel	Production of ethanol, xylitol and antioxidants in a biorefinery from olive tree wastes: process economics, carbon footprint and water consumption
	311	Yasunori Kikuchi and Yuichiro Kanematsu	Application of CAPE Tools into Prospective Life Cycle Assessment: A Case Study in Acetylated Cellulose Nanofiber-Reinforced Plastics
	312	Wei-Han Chen and Fengqi You	Climate Control in Controlled Environment Agriculture Using Nonlinear MPC
	313	Jamileh Fouladi, Tareq Al-Ansari, Ahmed Alnouss and Yusuf Bicer	Thermodynamic analysis of an integrated renewable energy driven EWF nexus: a trade-off analysis of combined systems
Process and Product Design/ Synthesis (2) 17,18,19,20,21,22,23	17	Juan-Manuel Restrepo-Florez and Christos T. Maravelias	Future biofuels: A Superstructure-based Optimization Framework Integrating Catalysis, Process Synthesis, and Fuel Properties
	18	Thien An Huynh, Vincent Reurslag, Maryam Raeisi, Meik B. Franke and Edwin Zondervan	Superstructure Optimization of Biodiesel Production from Continuous Stirred Tank and Membrane Reactors
	19	Jamie Rose and Thomas Adams	Process Design and Techno-Economic Analysis of Usage of Biomass Pyrolysis By-Products in the Ontario and Aichi Steel Industries
	20	Wanrong Wang, Jie Li and Nan Zhang	Optimal synthesis and design of solar-aided hydrogen production process using molten salt with integration of CO2 utilization
	21	Donghoi Kim, Zhongxuan Liu, Rahul Anantharaman, Luca Riboldi, Lars Odsæter, David Berstad, Thijs Peters, Jonathan Polfus, Harald Malerød-Fjeld and Truls Gundersen	Design of a novel hybrid clean hydrogen production process with membrane assisted CO2 capture through liquefaction
	22	Mohammad Lameh, Dhabia M. Al-Mohannadi and Patrick Linke	Analysis and design of integrated renewable energy and CO2 capture, utilization and storage systems for low cost emissions reduction
	23	Ali Al-Yaeeshi, Ahmed Alnouss and Tareq Al-Ansari	Techno-economic-environmental assessment for optimal utilisation of CO2 in the Fischer-Tropsch Gas-to-liquid Process
Process Dynamics and Control (2) 62,63,64,65,66,67,68	62	Naganjaneyulu Suruvu and Kazuya Ijichi	Real Time Optimization of series of fixed bed Catalytic reactors
	63	Yueyang Luo, Xinmin Zhang and Zhihuan Song	Self-triggered MPC for Perturbed Continuous-time Nonlinear Systems
	64	Anikesh Kumar, Lakshminarayan Samavedham, Iftekhar Karimi and Rajagopalan Srinivasan	A comparative study between MPC and selector-based PID control for an industrial heat exchanger
	65	Florian Joseph Baader, André Bardow and Manuel Dahmen	MILP Formulation for Dynamic Demand Response of Electrolyzers

Session	#	Authors	Title
	66	Erik Esche, Christian Hoffmann, Joris Weigert and Jens-Uwe Repke	Real-Time Optimal Operation of a Chlor-Alkali Electrolysis Process under Demand Response
	67	Styliani Avraamidou, Iosif Pappas and Efstratios Pistikopoulos	Explicit Multi-Objective and Hierarchical Model Predictive Control
	68	Iosif Pappas, Nikolaos A. Diangelakis, Richard Oberdieck and Efstratios N. Pistikopoulos	A Robust Optimization Strategy for Robust Explicit Model Predictive Control
Supply Chain Management and Logistics 91,92,93,94,95,96,97	91	Ioannis Giannikopoulos, Alkiviadis Skouteris, David T. Allen, Michael Baldea and Mark A. Stadtherr	Multi-Objective Optimization of Production Cost and Carbon Loss in the U.S. Petrochemicals Industry
	92	Amrita Sen, George Stephanopoulos and Bhavik Bakshi	Mapping Anthropogenic Carbon Mobilization through Chemical Process and Manufacturing Industries
	93	Brook Tesfamichael, Montastruc Ludovic, Stephane Negny and Abubeker Yimam	Optimal Design and Planning of Ethiopia's Biomass-to-Biofuel Supply Chain Considering Economic and Environmental Dimensions under Strategic and Tactical Levels
	94	Li Yu and Qiang Xu	A Novel Integrated Optimal Scheduling Framework for Holistic Refinery Supply Chain Management
	95	Adnan Al-Banna, Robert Franzoi, Brenno Menezes, Ahad Al-Enazi, Simon Rogers and Jeffrey Kelly	Roadmap to digital supply chain resilience
	96	Ken-Ichiro Sotowa	Development of Flexible Framework for Biomass Supply Chain Optimization
	97	Ariel Uribe-Rodriguez, Pedro M Castro, Gonzalo Guillen-Gosalbez and Benoit Chachuat	Lagrangean decomposition for integrated refinery – petrochemical short-term planning
Energy, Food and Environmental Systems (2) 314,315,316,317,318,319,320	314	Yasir Ibrahim, Dhabia Al-Mohannadi, Patrick Linke and Mohammad Lameh	Low Carbon Hydrogen production in industrial clusters
	315	Konstantin Matveev and Jacob Leachman	Thermoacoustic Flow-Through Cooler for Cryogenic Hydrogen
	316	Malik Sajawal Akhtar and Jay Liu	Life Cycle Assessment of Green Hydrogen Transportation ¥& Distribution Pathways
	317	Nicholas Salmon and René Bañares-Alcántara	Sector coupling of green ammonia production to Australia's electricity grid
	318	Shigeki Hasegawa, Shun Matsumoto, Yoshihiro Ikogi, Sanghong Kim, Miho Kageyama and Motoaki Kawase	Development of Muliti-purpose Dynamic Physical Model of Fuel Cell System
	319	Thomas Knight, Chao Chen and Aidong Yang	Embracing the era of renewable energy: model-based analysis of the role of operational flexibility in chemical production
	320	Cheng-Liang Chen, Jui-Yuan Lee and Kuan-Chen Chen	Hollow Fiber-based Rapid Temperature Swing Adsorption (RTSA) Process for Carbon Capture from Coal-fired Power Plants

Session	#	Authors	Title
Poster session on Monday, 20 June	31	Junqing Xia and Yoshiyuki Yamashita	Construction of Database and Data-driven Statistical Models for the Solubility of Nanomaterials in Organic Solvents
	32	Orakotch Padungwatanaroj, Nichakorn Kuprasertwong, Jakkraphat Kogncharoenkitkul, Kornkanok Udomwong, Anjan Tula and Rafiqul Gani	Fast, efficient and reliable problem solution through a new class of systematic and integrated computer aided tools
	33	Jia Wen Chong, Suchithra Thangalazhy-Gopakumar, Kasturi Muthoosamy and Nishanth Chemmangattuvalappil	Design of Bio-Oil Solvents using Multi-Stage Computer-Aided Molecular Design Tools
	34	J. Rafael Alcantara Avila, Maho Okunishi and Shinji Hasebe	Synthesis of azeotropic distillation processes without using a decanter
	35	Yutaka Yamada, Simone Genovese, Cal Depew, Ralph Cos, Hiroshi Kuwahara and Taiga Inoue	Reduce Environmental Impact and Carbon Footprint for Cost Competitive Process Plant Design: Integrating AVEVA Process Simulation with modeFRONTIER®
	36	Juin Yau Lim, Akos Orosz, Bing Shen How, Ferenc Friedler and Changkyoo Yoo	Reliability incorporated optimal process pathway selection for sustainable microalgae-based biorefinery system: P-graph approach
	37	Kensaku Matsunami, Sara Badr and Hirokazu Sugiyama	Framework for Designing Solid Drug Product Manufacturing Processes Based on Economic and Quality Assessment
Poster session on Monday, 20 June	38	Gwangsik Kim, Van Duc Long Nguyen, Dongyoung Lee, Yujeong Lee, Jonghoon Baek, Wonseok Jeong, Myungjin Kim, Choongyoung Kwag, Youngmok Lee, Sungwon Lee and Moonyoung Lee	Marine flue gas desulfurization processes: recent developments, challenges, and perspectives
	39	Renanto Renanto, Sony Ardian Affandy, Adhi Kurniawan, Juwari Purwo Sutikno and Rendra Panca Anugraha	A Novel Process Synthesis of a Dehydrating Unit of Domestic Natural Gas Using TEG Contactor and TEG Regenerator
	40	Ishanki De Mel, Saif Kazi and Michael Short	A new trust-region approach for optimization of multi-period heat exchanger networks with detailed shell-and-tube heat exchanger designs
	41	Jui-Yuan Lee and Wilasinee Seesongkram	A Mathematical Technique for Utility Exchanger Network synthesis and Total Site Heat Integration
	42	Hideyuki Matsumoto, Kanako Kurahashi, Haruna Tachikawa and Takaya Iseki	Synthesis and Assessment of NOx to Ammonia Conversion Process in Combined Cycle Power Generation Systems
	43	Nagyeong Lee, Dongil Shin and Jaewook Lee	Knowledge Integrated, Deep Neural Network-Based Prediction of Stress-Strain Curves of Polymer Composites for AI-Assisted Materials Design
	44	Kakeru Fujita, Ryousuke Akimoto, Yasuhiko Suzuki, Yuki Ogasawara and Keigo Matsuda	Evaluation of Economic Performance of CO2 Separation Process Using Mix MatrixX Membrane
Poster session on Monday, 20 June	45	Guillermo Galán, Mariano Martin and Ignacio E. Grossmann	Nature vs engineering: Production of methanol from CO2 capture
	46	Maryam Raeisi, Jiawei Huang, Thien An Huynh, Meik B. Franke and Edwin Zondervan	Superstructure optimization for the design of an algae biorefinery producing added value products
	47	Chatchan Treeyawetchakul	Process Simulation of Biodiesel Production Catalyzed by a High Stability Solid in a Reactive Distillation

Session	#	Authors	Title
	48	Thibaut Neveux, Tahar Nabil and Jean-Marc Commenge	Generatives Approaches for the Synthesis of Process Structures
	49	Xiang Zhang, Teng Zhou and Kai Sundmacher	Metal-Organic Framework Targeting for Optimal Pressure Swing Adsorption Processes
	50	Niels Normann Sørensen, Haoshui Yu, Lars Erik Ebbesen, Jesper Vester Leifhof Nielsen and Gü rkan Sin	Energy integration through retrofitting of heat exchanger network at Equinor Kalundborg Oil Refinery
	51	Alejandro Garciadiego, Mozammel Mazumder, Bridgette Befort and Alexander Dowling	Modeling and Optimization of Ionic Liquid Enabled Extractive Distillation of Ternary Azeotrope Mixtures
Poster session on Monday, 20 June	52	Dian Ning Chia and Eva Sorensen	Optimal Design of Hybrid Distillation/Pervaporation Processes
	53	Ting He, Truls Gundersen and Wensheng Lin	Design and analysis of a single mixed refrigerant natural gas liquefaction process integrated with ethane recovery and decarbonization using cryogenic distillation
	54	Zekun Yang, Nan Zhang and Robin Smith	A new decomposition approach for synthesis of heat exchanger network with gloabl heat exchanger optimization
	55	Jo Yee Ho, Wai Teng Tee and Yoke Kin Wan	A mathematical approach for synthesis of a wastewater treatment process for a new manufacturing plants via circular economy
	69	Yoichiro Ashida and Masanobu Obika	Data-driven Design of a Feed-forward Controller for Rejecting Measurable Disturbance
	70	Lucas Ferreira Bernardino, Dinesh Krishnamoorthy and Sigurd Skogestad	Optimal Operation of Heat Exchanger Networks with Changing Active Constraint Regions
	71	Shiro Masuda	Iterative Feedback Tuning for Regulatory Control Systems Using Estimate of Sensitivity Function
Poster session on Monday, 20 June	72	Markus Illner, Volodymyr Kozachynskyi, Erik Esche and Jens-Uwe Repke	D-RTO as Enabler for Green Chemical Processes – Systematic Application and Challenges in Reactive Liquid Multiphase Systems
	73	Evren Mert Turan, Rohit Kannan and Johannes Jä schke	Design of PID controllers using semi-infinite programming
	74	Max Mowbray, Panagiotis Petsagkourakis, Antonio Del Rio Chanona and Dongda Zhang	Safe Chance Constrained Reinforcement Learning for Batch Process Optimization and Control
	248	Mariko Fujimoto, Yoshihiro Hashimoto, Takuho Mitsunaga and Tatsuki Matsuzawa	Cyber Security Risks of aspects of operations of OPC Unified Architecture
	249	Federico Mione, Alexis Silva, Martin Luna, M. Nicolás Cruz Bournazou and Ernesto Martinez	Managing Experimental-Computational Workflows in Robotic Platforms using Directed Acyclic Graphs
	250	Yukiya Saito, Erika Mizuno, Tetsushi Miwa, Koki Watarai, Yukino Suzuki, Midori Sumi, Takashi Hamaguchi and Yoshihiro Hashimoto	Development of cyber incident exercise to be widely adopted in supply chains
	251	Jonathan Mädler, Isabell Viedt, Julius Lorenz and Leon Urbas	Requirements to a digital twin-centered concept for smart manufacturing in modular plants considering distributed knowledge
Poster session on Monday, 20 June	333	Sarah Namany, Ikhlas Ghiat, Fatima-Zahra Lahlou and Tareq Al-Ansari	An optimized resource supply network for sustainable greenhouses: A circular economy approach

Session	#	Authors	Title
	334	Diana Tinoco-Caicedo, Jhonatan Calle Murillo and Eduarda Feijóo Villa	Exergoeconomic optimization of a double effect evaporation process in an instant coffee plant in Ecuador
	335	Amira Siniscalchi, Ruben Lara and Maria Soledad Diaz	Ecohydrological modeling and dynamic optimization for water management in an integrated aquatic and agricultural livestock system
	336	Amjad Riaz, Muhammad Abdul Qyyum, Arif Hussain, Muhammad Islam, Hansol Choe and Moonyong Lee	Parametric Analysis of Ortho-to-Para Conversion in Hydrogen Liquefaction
	337	Qiao Yan Soh, Edward O'Dwyer, Salvador Acha and Nilay Shah	Model agnostic framework for analyzing rainwater harvesting system behaviors
	338	Lanyu Li and Xiaonan Wang	Global assessment and optimization of the economic and carbon reduction potential of renewable energy and negative emission technologies
	339	Maria Isabella Yliruka, Stefano Moret, Francisca Jalil-Vega, Adam Hawkes and Nilay Shah	The Trade-Off between Spatial Resolution and Uncertainty in Energy System Modelling
Poster session on Monday, 20 June	340	Varun Punnathanam and Yogendra Shastri	Designing a Resilient Biorefinery System under Uncertain Agricultural Land Allocation
	341	Carina L. Gargalo, Liliana A. Rodrigues, Alexandre Paiva, Ana Carvalho and Krist V. Gernaey	LCA modeling as a decision-tool for experimental design: the case of extraction of astaxanthin from crab waste
	342	Shoma Kato and Yasuki Kansha	Decomposition of organic compounds in water from oil refineries
	343	Yasuki Kansha and Masanori Ishizuka	Energy Harvesting Wireless Sensors Using Magnetic Phase Transition
	344	Bawornpong Pornchuti, Yuttana Phoochahan, Prarana Padma, Suchada Ruengrit and Pravit Singtothong	Competitive Adsorption of Copper, Nickel, and Chromium Ions onto Amine Functionalized SBA-15
	345	Antoine Merlo and Grégoire Léonard	Use of Environmental Assessnent and Techno Economic Analysis (TEA) to Evaluate the Impact and Feasibility of Coatings for Manufacturing Processes
	346	Sebastian Topalian, Xavier Flores-Alsina, Pedram Ramin, Kasper Kjellberg, Murat Kulahci, Damien Batstone and Krist Gernaey	Forecasting Operational Conditions: A case-study from dewatering of biomass at an industrial wastewater treatment plant
Poster session on Monday, 20 June	347	Vicente Tomas Monje, Helena Junicke, Kasper Kjellberg, Krist Gernaey and Xavier Flores-Alsina	Plant wide modelling of a full-scale industrial water treatment system
	348	Manali S. Zantye, Akhilesh Gandhi, Mengdi Li, Akhil Arora and M.M. Faruque Hasan	A Systematic Framework for the Integration of Carbon Capture, Renewables and Energy Storage Systems for Sustainable Energy
	349	Shoma Fujii, Yuichiro Kanematsu and Yasunorio Kikuchi	Integration of Experimental Study and Computer-Aided Design: A Case Study in Thermal Energy Storage
	350	Yuichiro Kanematsu, Shoma Fujii and Yasunori Kikuchi	Design support toolbox for renewable-based regional energy systems; The concept, data integration, and simulator development

Session	#	Authors	Title
	351	Nasyitah Husniyah Mahbob and Haslenda Hashim	Circular Economy Integration into Carbon Accounting Framework for Comprehensive Sustainability Assessment
	352	Shih-Chieh Chen and Jyh-Cheng Jeng	Design and Analysis of Fuel-Assisted Solid Oxide Electrolysis Cell Combined with Biomass Gasifier for Hydrogen Production
	353	Hossam A.Gabbar and Emmanuel Galiwango	Plasma-Based Pyrolysis of Municipal Solid Plastic Waste for a Robust WTE Process

Session	#	Authors	Title
Machine Learning and Big Data (1) 252,253,254,255,256,257,258	252	Chunpu Zhang, Shota Kato and Manabu Kano	Equivalence Judgment of Equation Groups Representing Process Dynamics
	253	Philipp Samuel Zuercher, Sara Badr, Stephanie Knueppel and Hirokazu Sugiyama	Data-driven operation support for equipment deterioration detection in drug product manufacturing
	254	Mark Jones, Mads Stevnsborg, Rasmus Nielsen, Deborah Carberry, Khosrow Bagherpour, Seyed Mansouri, Steen Larsen, Krist Gernaey, Jochen Dreyer, Jakob Huusom, John Woodley and Kim Dam-Johansen	PILOT PLANT 4.0: A Review of Digitalization Efforts of the Chemical Engineering Department at the Technical University of Denmark (DTU)
	255	Ai Yanaga and Masaru Noda	Identification Method of Multiple Sequential Alarms Occured Simultaneously in Plant Operation Data
	256	Deyang Wu and Jinsong Zhao	Understand how CNN diagnoses faults with Grad-CAM
	257	Rexonni Lagare, M. Ziyan Sheriff, Marcial Gonzalez, Zoltan Nagy and Gintaras Reklaitis	A Comprehensive Framework for the Modular Development of Condition Monitoring Systems for a Continuous Dry Granulation Line
	258	Shu Xu and Mark Nixon	Framework for Suppressing Transient Fault Alarms Online
Scheduling and Planning 75,76,77,78,79,80,81	75	Iiro Harjunkoski and Teemu Ikonen	Combining Machine Learning with Mixed Integer Linear Programming in Solving Complex Scheduling Problems
	76	Dan Li, Dongda Zhang, Nan Zhang, Liping Zhang and Jie Li	Knowledge-Guided Hybrid Approach for Scheduling Multipurpose Batch Plants
	77	Akshay Ajagekar and Fengqi You	Scheduling of Electrical Power Systems under Uncertainty using Deep Reinforcement Learning
	78	Max Mowbray, Dongda Zhang and Antonio Del Rio Chanona	A Reinforcement Learning Approach to Online Scheduling of Single-Stage Batch Chemical Production Processes
	79	Ilias Mitrai and Prodromos Daoutidis	An adaptive multi-cut decomposition based algorithm for integrated closed loop scheduling and control
	80	Yuqing Luo and Marianthi Ierapetritou	Uncertainty Evaluation of Biorefinery Supply Chain's Economic and Environmental Performance Using Stochastic Programming
	81	Vassilios Yfantis, Alexander Babskiy, Christian Klanke, Martin Ruskowski and Sebastian Engell	An Improved Optimization Model for Scheduling of an Industrial Formulation Plant based on Integer Linear Programming
Process and Product Design/ Synthesis (3) 24,25,26,27,28,29,30	24	Yuqiu Chen, Xiaodong Liang and Georgios Kontogeorgis	Machine Learning-based Hybrid Process Design for the Recovery of Ionic Liquids
	25	Shuang Xu, Toby Crump, Selen Cremaschi, Mario Eden and Anjan Tula	A Short-Cut Method for Synthesis of Solvent-based Separation Processes
	26	Kyeongjun Seo, Zichao Chen, Joan F. Brennecke, Thomas F. Edgar, Mark A. Stadtherr and Michael Baldea	Modeling and Optimization of Ionic-Liquid-Based Carbon Capture: Impact of Thermal Degradation Kinetics

Session	#	Authors	Title
	27	Taofeeq O. Bello, Rita M.B. Alves, Antonio E. Bresciani and Claudio A.O. Nascimento	Process Design of Formic Acid and Methanol Production from CO2 Promoted by Ionic Liquid: Techno-Economic Analysis
	28	Jaehyun Shim and Jong Min Lee	Synthesis of Distillation Sequence with Thermally Coupled Configurations Using Reinforcement Learning
	29	Fanyi Duanmu and Eva Sorensen	Optimal Design of Heat Integrated Reduced Vapor Transfer Dividing Wall Columns
	30	Sultana R Syeda, Easir A Khan, Nichakorn Kuprasertwong, Orakotch Padungwatanaroj and Rafiqul Gani	A Model-Data Driven Chemical Analysis System for Products and Associated Processes
Integration of Process Operations and Design/ Synthesis (1) 117,118,119,120,121,122,123	117	Can Li, Antonio Conejo, Peng Liu, Benjamin Omell, John Siirola and Ignacio Grossmann	Power Systems Infrastructure Planning with High Renewables Penetration
	118	Seolhee Cho and Ignacio E. Grossmann	An Optimization Model for Design and Operation of Reliable Power Generation Systems
	119	Eduardo Perez-Cisneros, Mario Eden and Rafiqul Gani	Rule-based Framework for Retrofitting Conventional Processes with Integrated Units
	120	Christian Hoffmann, Erik Esche and Jens-Uwe Repke	Integration of Design and Operation for the CO2-based Methanol Synthesis
	121	Hussain Alibrahim, Siddig Khalafalla, Usama Ahmed and Umer Zahid	Blue Syngas Synthesis via the Integration of Gasification and Reforming Processes
	122	Ana Somoza-Tornos, Omar J. Guerra, Wilson A. Smith and Bri-Mathias Hodge	Network optimization of the electrosynthesis of chemicals from CO2
	123	Hua Liu, Lasse Røngaard Clausen, Ligang Wang and Ming Chen	A robust design of heat exchanger network for high temperature electrolysis systems
Machine Learning and Big Data (2) 259,260,261,262,263	259	Quirin Göttl, Dominik G. Grimm and Jakob Burger	Using Reinforcement Learning in a Game-like Setup for Automated Process Synthesis Without Prior Process Knowledge
	260	Tim Janus, Felix Riedl and Sebastian Engell	Generation and Benefit of Surrogate Models for Blackbox Chemical Flowsheet Optimization
	261	Lukas Schulze Balhorn, Qinghe Gao, Dominik Goldstein and Artur M. Schweidtmann	Flowsheet recognition using deep convolutional neural networks
	262	Julia Granacher and François Maréchal	Active learning for multiobjective optimizaiton of processes and energy systems
	263	Burcu Beykal, Zahir Aghayev, Onur Onel, Melis Onel and Efstratios N. Pistikopoulos	Data-driven Stochastic Optimization of Numerically Infeasible Differential Algebraic Equations: An Application to the Steam Cracking Process
Process Intensification 106,107,108,109,110	106	Tony Joseph Mathew, Mohit Tawarmalani and Rakesh Agrawal	Systematically Identifying Energy-Efficient and Attractive Multicomponent Distillation Configurations
	107	Isabel Pazmiño Mayorga, Anton Kiss and Megan Jobson	Synthesis of Advanced Reactive Distillation Technologies: Early-Stage Assessment Based on Thermodynamic Properties and Kinetics
	108	Zewei Chen, Edwin Andres Rodriguez Gil and Rakesh Agrawal	Process Synthesis and Intensification for Upgrading Natural Gas Liquids in Shale Gas

Session	#	Authors	Title
	109	Xinyan Liu, Yang Lei, Hao Luo, Xiaoqin Wu and Rafiqul Gani	Energy-Efficient Direct Cyclohexene to Cyclohexanol Process by Heat Pump Assisted Reactive Distillation
	110	Mohammed Sadaf Monjur, Ashfaq Iftakher and M. M. Faruque Hasan	Sustainable Process Intensification of Refrigerant Mixture Separation and Management: A Multiscale Material Screening and Process Design Approach
Energy, Food and Environmental Systems (3) 321,322,323,324,325	321	Eric O'Neill and Christos Maravelias	Determining Accurate Biofuel System Outcomes: Spatially Explicit Methods for Combined Landscape-Feedstock and Supply Chain Design
	322	Cecilia Salah, Selene Cobo Gutiérrez and Gonzalo Guillén-Gosálbez	Assessing the Environmental Potential of Hydrogen from Waste Polyethylene
	323	Antonio Sánchez, Elena C. Blanco, Mariano Martín and Pastora Vega	A Systematic Comparison of Renewable Liquid Fuels for Power Generation: Towards a 100¥% Renewable Energy System
	324	Vyom Thakker and Bhavik Bakshi	Guiding Innovations and Value-chain improvements using Life-cycle design for Sustainable Circular Economy
	325	Caroline Satye Martins Nakama, Agnes Camilla Tysland, Brage Rugstad Knudsen and Johannes Jäschke	Simultaneous Optimal Operation and Design of a Thermal Energy Storage Tank for District Heating Systems with Varying Energy Source
Integration of Process Operations and Design/ Synthesis (2) 124,125,126,127,128	124	Sara Badr, Kozue Okamura, Nozomi Takahashi and Hirokazu Sugiyama	Techno-economic Assessment of Upstream and Downstream Process Alternatives for the Production of Monoclonal Antibodies
	125	Ahmad Naquash, Muhammad Abdul Qyyum and Moonyong Lee	Biomethane liquefaction followed by crystallization based biogas upgrading process
	126	Nicholas Salmon and Rene Banares-Alcantara	Importance of interannual renewable energy variation in the design of green ammonia plants
	127	Elizabeth Abraham, Dhabia Al-Mohannadi and Patrick Linke	Integrating Carbon Negative Technologies in Industrial Clusters
	128	Christian Langner, Elin Svensson, Stavros Papadokonstantakis and Simon Harvey	Flexibility analysis of chemical processes considering overlaying uncertainty sources

Session	#	Authors	Title
Poster session on Tuesday, 21 June	82	Demian Presser, Vanina Cafaro and Diego Cafaro	Optimal Sourcing, Supply and Development of Carbon Dioxide Networks for Enhanced Oil Recovery in CCUS Systems
	83	Lautaro Marcolini, Franco Novara and Gabriela Henning	Production scheduling in multiproduct multistage semicontinuous processes. A constraint programming approach
	84	Bogdan Dorneanu, Vassilis Vassiliadis and Harvey Arellano-Garcia	Maintenance scheduling optimization for decaying performance nonlinear dynamic processes: Advancements and future directions
	85	Parag Patil, Babji Srinivasan and Rajagopalan Srinivasan	Cleaning Schedules for Heat Exchanger Networks Subjected to Maintenance Constrains
	86	Nicole Cortes, Xian Gao, Bernard Knueven and Alexander Dowling	Estimating Energy Market Schedules using Historical Price Data
	87	Hector Perez, John Wassick and Ignacio Grossmann	Scheduling of Material and Information Flows in the Manufacturing of Chemicals for the Order-to-Cash Process of a Digital Supply Chain
	88	Jian Su, Yuhong Wang, Su Zhang and Xiaoyong Gao	Optimization of Maximum Completion Time of Polymerization Section Based on Improved Estimation of Distribution Algorithm
Poster session on Tuesday, 21 June	89	Christian Klanke, Engelbert Pasieka, Dominik Bleidorn, Christian Koslowski, Christian Sonntag and Sebastian Engell	Evolutionary Algorithm-based Optimal Batch Production Scheduling
	90	Misagh Ebrahimpour, Wei Yu and Brent Young	Cream Cheese Fermentation Scheduling
	98	Hanchu Wang, Prodromos Daoutidis and Qi Zhang	Green Ammonia Supply Chain Design for Maritime Transportation
	99	Sergio Iván Martínez-Guido, Claudia Gutiérrez-Antonio, Juan Fernando Garcia-Trejo and Fernando Israel Gómez-Castro	Optimal agriculture residues revalorization as a biofuel alternative in electric power grids
	100	Apoorva Katragadda, Xiaonan Wang and Iftekhar Abubakar Karimi	Global Supply Chain Optimization for COVID-19 Vaccine
	101	Dnyanesh Deshpande, Rajagopalan Srinivasan and Iftekhar Karimi	Optimal Liquefied Natural Gas (LNG) Annual Delivery Program Reflecting Both Producer and Customer Perspectives
	102	Fabian Lechtenberg, Antonio Espuña and Moisès Graells	The Waste-to-Resource Game: Informed Decision-Making for Plastic Waste Transformers
Poster session on Tuesday, 21 June	103	Valentina Negri and Gonzalo Guillén-Gosálbez	Implications of Optimal BECCS Supply Chains on Absolute Sustainability
	104	Kevin Dooley, Fatima Hafsa, Matt Scholz, Bhavik Bakshi, Vyom Thakker, George Basile and Raj Buch	A Multi-Disciplinary Assessment of Innovations to Improve Grocery Bag Circularity
	105	Cátia da Silva, Ana Barbosa-Póvoa and Ana Carvalho	Process Sustainable Supply Chain: integrating monetization strategies in the design and planning
	111	Eva Sorensen, Aikaterini Tsatse, Stijn Oudenhoven and Antoon ten Kate	A systematic methodology for the optimisation, control and consideration of uncertainty of reactive distillation
	112	Saif Kazi, Rahul Gandhi and Lorenz Biegler	Equation Oriented Optimization of Multi Stream Heat Exchanger Design and Operation in Natural Gas Liquefaction Process

Session	#	Authors	Title
	113	Yingjie Ma, Nan Zhang and Jie Li	Optimal Design of Extractive Dividing-Wall Column Using an Improved Sequential Least Squares Programming Algorithm
	114	Abhimanyu Pudi, Martin Andersson and Seyed Soheil Mansouri	Biphasic Dehydration of Sugars to 5-Hydroxymethylfurfural and Furfural—Multiscale Modeling for Easier Optimization and More Accurate Solvent Selection
Poster session on Tuesday, 21 June	115	Bushra Khatoon, Shabih Ul Hasan and M. Siraj Alam	Study of Mass Transfer Coefficient of CO2 Capture in Different Solvents using Microchannel: A Comparative Study
	116	Chinmoy B. Mukta, Nikhil R. Rayaprolu, Selen Cremaschi, Mario R. Eden and Bruce J. Tatarchuk	Techno-Economic Study of Intensified Ethylene Oxide Production Using High Thermal Conductivity Microfibrous Entrapped Catalyst
	129	Nga Thi Quynh Do, Stephane Haag, Frank Castillo-Welter and Armin Guenther	Flexible and Sustainable Methanol Production Including Option with Green Hydrogen
	130	Tsai-Wei Wu and I-Lung Chien	Optimization and Heat Exchanger Network Design of Diethyl Carbonate Two-step Synthesis Process from CO2 and Propylene Oxide
	131	Monzure-Khoda Kazi, Fadwa Eljack, Nikolaos Kazantzis, Vasiliki Kazantzi and Saad Ali Al-Sobhi	Characterization of Industrial Flaring under Uncertainty for the Design of Optimum Flare Recovery and Utilization Systems
	132	Ryosuke Akimoto, Yasuhiko Suzuki, Yuki Ogasawara, Masaru Nakaiwa and Keigo Matsuda	Development of Micro Scale ORC Using Low Grade Geothermal Thermal Energy
	133	Abdul Ahmed, Kayla L. Richardson, Yufei Zhao and Cornelius M. Masuku	Scenario Outcomes for Electric Power Generation Expansion Planning considering the State of Indiana as a Case Study
Poster session on Tuesday, 21 June	134	Isabell Viedt, Jonathan Mädler, Julius Lorenz and Leon Urbas	Requirements for the quality assessment of virtual commissioning models of modular process plants
	278	Shota Kato and Manabu Kano	Towards An Automated Physical Model Builder: CSTR Case Study
	279	Son Ich Ngo and Young-Il Lim	Forward physics-informed neural networks for catalytic CO2 methanation via isothermal fixed-bed reactor
	280	Xinmin Zhang, Jiang Zhai, Zhihuan Song and Yuan Li	Hashing-based just-in-time learning for big data quality prediction
	281	Chaitanya Sampat and Rohit Ramachandran	Physics-constrained autoencoder neural network for the prediction of key granule properties in a twin-screw granulation process
	282	Borja Martinez, Manuel Rodriguez and Ismael Diaz	CSTR control with deep reinforcement learning
	283	Manu Suvarna, Pravin P.S, Ken Shaun Yap and Xiaonan Wang	Application of machine learning and big data for smart energy management in manufacturing
Poster session on Tuesday, 21 June	284	Robert Franzoi, Brenno Menezes, Jeffrey Kelly and Christopher Swartz	Adaptive least-squares surrogate modeling for reaction systems
	285	Hidehisa Togo, Kohei Asanuma and Tatsushi Nishi	Machine Learning and Inverse Optimization Approach for Model Indentification of Scheduling Problems in Chemical Batch Plants
	286	Rishabh Gupta and Qi Zhang	Decision-Focused Surrogate Modeling with Feasibility Guarantee

Session	#	Authors	Title
	287	Shi-Chang Chang, Chun-Yung Chang, Hao-Yeh Lee and I-Lung Chien	Grade Transition Optimization by Using Gated Recurrent Unit Network for Styrene-acrylonitrile Copolymer Process
	288	Kazuhiro Takeda	Development of Estimating Algorithm for Biodegradation of Chemicals Using Clustering and Learning Algorithm
	289	Maaz Ahmad and Iftekhar A. Karimi	Surrogate Classification based on Accuracy and Complexity
	290	William Bradley, Gabriel S. Gusmão, Andrew J. Medford and Fani Boukouvala	Training Stiff Dynamic Process Models via Neural Differential Equations
Poster session on Tuesday, 21 June	291	Louis Allen, Jack Atkinson, Joan Cordiner, Mohammad Zandi and Peyman Moghadam	Wiz 4.0: A Novel Data Visualization and Analytics Dashboard for a Graphical Approach to Industry 4.0
	292	Luise Middelhauve and Francois Marechal	About data reduction techniques and the role of outliers for complex energy systems
	293	Adem Rosenkvist Nielsen Aouichaoui, Resul Al and Gürkan Sin	deepGSA: Plant data-driven global sensitivity analysis using deep learning
	294	Danny Hartanto Djarum, Nur Hidanah Anuar, Zainal Ahmad and Jie Zhang	Analyzing Different Dynamically Modelled Data Structures and Machine Learning Algorithms to Predict PM2.5 Concentration
	295	Jimena Ferreira, Martín Pedemonte and Ana I. Torres	A multi-output machine learning approach for surrogate modeling generation in process engineering
	296	Shumpei Kubosawa, Takashi Onishi, Yoshimasa Tsuruoka, Yasuo Fujisawa, Masanori Endo, Atsushi Uchimura, Masahiko Tatsumi, Norio Esaki, Gentaro Fukano, Tsutomu Kimura, Akihiko Imagawa and Takayasu Ikeda	Practical Human Interface System for Transition Guidance in Chemical Plants using Reinforcement Learning
	297	Tasabeh Ali, Robert Franzoi and Brenno Menezes	Surrogate modeling for nonlinear gasoline blending operations
Poster session on Tuesday, 21 June	298	Haoran Li and Tong Qiu	Continuous Manufacturing Process Sequential Prediction using Temporal Convolutional Network
	299	Aisha Al-Hammadi, Robert Franzoi, Omar Ibrahim and Brenno Menezes	Surrogate Modeling for Mixed Refrigerant Streams in the Refrigeration Cycle of an LNG Plant
	300	Chonghyo Joo, Hyundo Park, Seokyoung Hong, Jongkoo Lim, Insu Han, Hyungtae Cho and Junghwan Kim	Prediction for heat deflection temperature of polypropylene composite with Catboost
	301	Teng Zhou, Zihao Wang and Kai Sundmacher	A New Machine Learning Framework for Efficient MOF Discovery: Application to Hydrogen Storage
	302	Nahyeon An, Hyukwon Kwon, Hyungtae Cho and Junghwan Kim	Data-driven modeling for magma density in continuous crystallization process
	303	Ke Wang, Mortaza Saeidi-Javash, Minxiang Zeng, Zeyu Liu, Yanliang Zhang, Tengfei Luo and Alexander Dowling	Gaussian Process Regression Machine Learning Models for Photonic Sintering
	304	Jonghun Lim, Soohwan Jeong, Sungsu Lim, Hyungtae Cho, Jae Yun Shim, Seok Il Hong, Soon Chul Kwon, Heedong Lee, Il Moon and Junghwan Kim	Development of dye exhaustion behavior prediction model using deep neural network

Session	#	Authors	Title
Poster session on Tuesday, 21 June	305	Ashfaq Iftakher, Chinmay M. Aras and M. M. Faruque Hasan	Guaranteed Error-bounded Surrogate Modeling and Application to Thermodynamics
	306	Isadora F. Brazolin, Felipe Matheus M. Sousa, Flavio V. Silva, Viktor O. C. Concha and Cristiana M. P. Yoshida	Development of an ANN-based soft-sensor to estimate pH variations in Smart Packaging Systems with visual indicators
	307	Farnaz Yousefi Zowj, Kerul Suthar, Marisha Speights and Peter He	Process Systems Engineering Guided Machine Learning for Speech Disorder Screening in Children

Session	#	Authors	Title
Pharma and Healthcare Systems (1) 354,355,356,357,358,359,360	354	Pooja Bhalode, Yingjie Chen and Marianthi Ierapetritou	Hybrid modeling strategies of continuous pharmaceutical manufacturing within digital twin framework
	355	Daniel Laky, Daniel Casas-Orozco, Francesco Rossi, Gintaras Reklaitis, Zoltan Nagy and Jaron Mackey	Determination of probabilistic design spaces in the hybrid manufacture of an active pharmaceutical ingredient using PharmaPy
	356	Kozue Okamura, Sara Badr, Sei Murakami and Hirokazu Sugiyama	Hybrid Modelling of CHO-MK Cell Cultivation in Monoclonal Antibody Production
	357	Atli Freyr Magnússon, Gürkan Sin, Stuart Stocks and Jari Pajander	Multimodal modelling of uneven batch data
	358	Yan-Shu Huang, M. Ziyan Sheriff, Sunidhi Bachawala, Marcial Gonzalez, Zoltan Nagy and Gintaras Reklaitis	Application of MHE-based NMPC on a Rotary Tablet Press under Plant-Model Mismatch
	359	Shuichi Tanabe, Shubhangini Awasthi, Srikanth Gopireddy and Daiki Kako	Gray-box modeling of pharmaceutical roller compaction process
	360	Mohamad H. Muhieddine, Shekhar K. Viswanath, Amparo Galindo, Alan Armstrong and Claire S. Adjiman	Multi-objective Optimisation for Pharmaceutical Process Development
Machine Learning and Big Data (3) 264,265,266,267,268,269,270	264	Charlotte Cronjaeger, Richard Pattison and Calvin Tsay	Tensor-Based Autoencoder Models for Hyperspectral Produce Data
	265	Adem Rosenkvist Nielsen Aouichaoui, Fan Fan, Seyed Soheil Mansouri, Jens Abildskov and Gürkan Sin	Molecular Representations for Deep Learning Applications within Thermophysical Property Prediction: A Comparative Study
	266	Gustavo Campos, Simge Yildiz, Ahmet Palazoglu and Nael El-Farra	Deep Reinforcement Learning for Continuous Process Scheduling with Storage, Day-Ahead Pricing and Demand Uncertainty
	267	Shuyuan Zhang, Xinye Huang, Kai Wang and Tong Qiu	Convolutinoal Neural Network Based Detection and Measurement for Microfluidic Droplets
	268	Jialin Liu, Bing-Yen Tsai and Ding-Sou Chen	Deep Reinforcement Learning Based Controller for Modified Claus Process
	269	Xie Changrui, Chen Xi, Yao Runjie, Liu Zhengbang and Zhu Lingyu	Process performance prediction based on spatial and temporal feature extraction through bidirectional LSTM
	270	Ana Cláudia O. Souza, Flávio V. Silva and Maurício B. Souza Jr.	Exploring the potential of fully convolutional neural networks for FDD of a chemical process
Modeling, Analysis and Simulation (1) 135,136,137,138,139,140,141	135	Nima Nazemzadeh, Josep Serra Olive, Rasmus Fjordbak Nielsen, Krist V. Gernaey, Martin P. Andersson and Seyed Soheil Mansouri	A combinatorial tool for monitoring flocculation processes: Using non-invasive measurements and hybrid deep learning assisted modeling
	136	Enrico Sangoi, Marco Quaglio, Fabrizio Bezzo and Federico Galvanin	Optimal Design of Experiment Based on Artificial Neural Network Classifiers for Fast Kinetic Model Recognition
	137	Mohd Sharizan Md Sarip, Felicia Kang Suet Lyna, Mohd Rizuan Mansor and Ken-Ichiro Sotowa	Modelling of the rice bran protein extraction using response surface methodology
	138	Jun-Jie Lai, Shih-Jie Pan, Chong-Wei Ong and Cheng-Liang Chen	Weibull Reliability Regression Model for Precise Prediction of Bearing Remaining Useful Life

Session	#	Authors	Title
	139	Joschka Winz, Florian Fromme and Sebastian Engell	Supporting Hyperparameter Optimization in Adaptive Sampling Methods
	140	Ronny Tobias Zimmermann, Jens Bremer and Kai Sundmacher	Optimal Catalyst-Reactor Design for Load-Flexible CO2 Methanation by Multi-Period Design Optimization
	141	Mina Naeini, James S. Cotton and Thomas A. Adams II	Data-Driven Modeling of Long-term Performance Degradation in Solid Oxide Electrolyzer Cell System
Optimization Methods and Computational Tools (1) 188,189,190,191,192,193,194	188	Noriyuki Yoshio and Lorenz T. Biegler	A Nested Schur Decomposition Approach for Multiperiod Process Optimization
	189	Ahmed Alnouss and Saad Al-Sobhi	Design and Optimization of Boil-off Gas Recycling Strategy in Liquefied Natural Gas Production
	190	Robert Parker, Lorenz Biegler, Bethany Nicholson, John Siirola and Carl Laird	An implicit function formulation for nonlinear programming with index-1 differential algebraic equation systems
	191	Yuanmeng Duan, Guoxiong Zhan, Fei Chang, Sensen Shi, Jens Abildskov, Jakob Kjøbsted Huusom and Xiangping Zhang	Multi-objective optimization of NH3 and CO2 separation with ionic liquid process
	192	Risvan Dirza, Dinesh Krishnamoorthy and Sigurd Skogestad	Primal-dual Feedback-optimizing Control with Direct Constraint Control
	193	Damien van de Berg, Panagiotis Petsagkourakis, Nilay Shah and Ehecatl Antonio del Rio-Chanona	Data-driven distributed optimization for systems consisting of expensive black-box subproblems
	194	Ning Zhao and Fengqi You	Data-Driven Adaptive Robust Unit Commitment Assisted by Machine Learning Techniques
Pharma and Healthcare Systems (2) 361,362,363,364,365,366,367	361	Zoltán Kis, Kyungjae Tak, Dauda Ibrahim, Simon Daniel, Damien van de Berg, Maria Papathanasiou, Benoît Chachuat, Cleo Kontoravdi and Nilay Shah,	Quality by design and techno-economic modelling of RNA vaccine production for pandemic-response
	362	Tomoyuki Taguchi, Yoshiyuki Yamashita, Toshiyuki Watanabe and Shigeru Kado	Design of Value Function Trajectory for State of Control in Continuous Manufacturing System
	363	Nethrue Pramuditha Mendis and Richard Lakerveld	A Thermodynamic Approach for Simultaneous Solvent, Coformer, and Process Optimization of Continuous Cocrystallization Processes
	364	Suela Jonuzaj, Christopher L. Burcham, Amparo Galindo, George Jackson and Claire S. Adjiman	Optimizing the selection of drug-polymer-water formulations for spray-dried solid dispersions in pharmaceutical manufacturing
	365	Masahiro Yamada, Isuru A. Udugama, Sara Badr, Kenichi Zenitani, Kokichi Kubota, Hayao Nakanishi and Hirokazu Sugiyama	Integrated design of injectable manufacturing processes considering characteristics of process- and discrete-manufacturing systems
	366	Niki Triantafyllou, Andrea Bernardi, Matthew Lakelin, Nilay Shah and Maria Papathanasiou	A bi-level decomposition approach for CAR-T cell therapies supply chain optimisation
	367	Yusuke Hayashi, Kota Oishi and Hirokazu Sugiyama	An agent-based model for cost-effectiveness analysis in the manufacture of allogeneic human induced pluripotent cells in Japan

Session	#	Authors	Title
Process Monitoring and Safety 221,222,223,224,225,226,227	221	Garima Patel and Mani Bhushan	Design of Non-Redundant Sensor Networks for Reliable Estimation in Nonlinear Systems
	222	Yang Li, Cheng Ji, Jingde Wang and Wei Sun	A novel global-local feature preserving projection method based on adaptive linear local tangent space alignment for process monitoring
	223	Efi Safikou and George Bollas	Prognostics on Noisy and Uncertain Dynamic Systems using Cumulative Sum Chart of Inferential Sensors
	224	Gustavo L.R. Caldas, Thiago F.B. Bento, Roger M. Moreira and Maurício B. de Souza Jr.	Quantifying Subsea Gas Leakages using Machine Learning: a CFD-based study
	225	Yuchen Wang, Zuzhen Ji, Shuanghua Yang and Yi Cao	Dynamic Risk Analysis for Process Safety
	226	Bogdan Dorneanu, Mohamed Heshmat, Abdelrahim Mohamed and Harvey Arellano-Garcia	Monitoring of smart chemical processes: A Sixth Sense approach
	227	Pedram Ramin, Xavier Flores-Alsina, Sebastian Olivier Nymann Topalian, Ulf Jeppsson and Krist Gernaey	Fault detection in a benchmark simulation model for wastewater treatment plants
Modeling, Analysis and Simulation (2) 142,143,144,145,146,147,148	142	Toji Kakiuchi, Tomoyuki Yajima, Nobuyuki Shigaki and Yoshiaki Kawajiri	Modeling and Optimal Design of Pressure Swing Adsorber for Carbon Dioxide and Hydrogen Separation from Industrial Waste Gas
	143	Xinhong Liu, Jialu Wang, Jonathan Ouimet, William Phillip and Alexander Dowling	Membrane Characterization with Model-Based Design of Experiments
	144	Robert Pujan, Philipp Sengupta and Heinz A. Preisig	Systematic Modelling of Distillation Columns based on Topologies and Ontologies
	145	David Young, Yasuhiro Shoji, Maliha Yel Mahi, Selen Cremaschi, Lorenzo Cremaschi and Mike Ellis	Sensitivity Analysis of an Electrospray Dehumidification System
	146	Junu Kim, Hironori Yonekura, Takeaki Watanabe, Satoshi Yoshikawa, Hayao Nakanishi, Hirokazu Sugiyama and Sara Badr	Rigorous modeling for assessing batch and flow syntheses of drug substance in heterogeneous hydrogenation
	147	J. Rafael Alcantara Avila and Rodrigo Tinoco Saenz	Assessment on the heat integration potential for different pressure thermally coupled distillation structures
	148	Chengyu Han, Shiping Huang and Wei Sun	Python platform for Tennessee Eastman Process
Optimization Methods and Computational Tools (2) 195,196,197,198,199,200,201	195	Philipp Kenkel, Timo Wassermann and Edwin Zondervan	Heat integration for superstructure models: A MILP formulation for easy implementation and fast computing
	196	Purusothmn Nair S Bhasker Nair, Raymond Tan, Dominic Foo and Michael Short	A Software Framework for Optimal Multiperiod Carbon-Constrained Energy Planning
	197	Ikhlas Ghiat, Ahmed Alnouss and Tareq Al-Ansari	Superstructure optimisation in various carbon capture and utilisation supply chains
	198	David Young, Mark Carpenter and Selen Cremaschi	Efficient Scenario Generation for Stochastic Programs with Extreme Events

Session	#	Authors	Title
	199	Jaime David Ponce-Rocha, Martín Picón-Núñez, Andreia Santos, Ana Carvalho, Fernando I. Gómez-Castro and Ricardo Morales-Rodriguez	A Sustainable Framework for Optimal and Flexible Design Under Uncertainty in Separation Processes: Exergy, Energy, Economic, and Environmental Aspects
	200	Wonsuk Chung and Jay H. Lee	Application of nonlinear surrogate models on optimization of carbon capture and utilization network
	201	Alexander Guzman, Haruka Tanaka, Hajime Ohno and Yasuhiro Fukushima	Systematic process energy optimization via multi-level heat integration: A case study on low-temperature reforming for methanol synthesis

Session	#	Authors	Title
Poster session on Wednesday, 22 June	156	Andrei Torgashov, Svetlana Samotylova and Fan Yang	Soft sensors development for industrial reactive distillation processes under small training datasets
	157	Kensuke Suzuki, Tomoyuki Yajima and Yoshiaki Kawajiri	Comprehensive quantification of model prediction uncertainty for simulated moving bed chromatography
	158	Mohammad Alherbawi, Ahmed Alnouss, Rajesh Govindan, Gordon McKay and Tareq Al-Ansari	A predictive model for multi-criteria selection of optimal thermochemical processing pathways in biorefineries
	159	Ken-Ichiro Sotowa, Soranasataporn Pattana, Osamu Tonomura and Sanghong Kim	Numerical Investigation of the Shear Rate Variation in Cooling Crystallization
	160	Seongwoong Min, Amjad Riaz, Muhammad Abdul Qyyum, Hansol Choe, Sang-gi Moon and Moonyong Lee	Application of machine learning model to optimization of hydrogen liquefaction process
	161	Diego Román-Montalvo and Myrna H. Matus	Density Functional Theory Study on the CO2 Absorption Process with Ionic Liquids
	162	Alejandro Solis-Jácome, Victor Rivera, Griselda Castruita de León and Miguel Morales-Cabrera	Transport of CO2/CH4 through Dense Membranes: Synthesis, Characterization, Experiments and Mass Transfer Modeling
Poster session on Wednesday, 22 June	163	Richard Yentumi, Bogdan Dorneanu and Harvey Arellano-Garcia	Mathematical Modelling, Simulation and Optimisation of an Indirect Water Bath Heater at the Takoradi Distribution Station (TDS)
	164	Dong Young Lee, Van Duc Long Nguyen, Gwangsik Kim, Myungjin Kim, Choongyong Kwag, Youngmok Lee, Sungwon Lee and Moonyong Lee	Marine SOx Scrubber: Mass transfer Analysis, Design, Simulation and Experiment
	165	Julien de Beer and Mihaela Hahne	Connecting the simulation model to its digital twin to help drive sustainability
	166	Fabian Lechtenberg, Osamu Tonomura, Satoshi Taniguchi and Shinji Hasebe	Development of Predictive Model for the Size of Gas and Liquid Slugs formed in Millimeter Scaled T-Junctions
	167	Andrea Bernardi, Fatima Bello, Antonio Valente, David Chadwick, Gonzalo Guillen-Gonzalbez and Benoit Chachuat	Enviro-economic assessment of DME synthesis using hydrogen obtained from methane pyrolysis and CO2
	168	Chinmoy B. Mukta, Selen Cremaschi and Mario R. Eden	Operational Envelopes of Cost-effective Sour Gas Desulfurization Processes
	169	Usama Ahmed, Umer Zahid, Nabeel Ahmad and Nauman Ahmad	Process Alternatives for the Co-Production of Hydrogen and Methanol using Fuel Switch and Energy Mix Systems
Poster session on Wednesday, 22 June	170	Heinz A Preisig	Documenting Models Comprehensively Using a Minimal Graphical Language
	171	Jingyu Zhang, Shuai Zhang, Le Wu, Yuqi Wang and Lan Zheng	Simulation and CO2 emission analysis for co-processing of bio-oil and vacuum gas oil
	172	Jinliang Ma, Miguel Zamarripa, John Eslick, Quang Le, Debangsu Bhattacharyya, Lorenz Biegler, Stephen Zitney, Anthony Burgard and David Miller	Dynamic Simulation and Optimization of a Subcritical Coal-Fired Power Plant During Load-Ramping Operations
	173	Santiago Zapata Boada, Maria Gonzalez Miquel, Megan Jobson and Rosa Cuellar Franca	Solvent screening methodology considering techno-economic and environmental sustainability criteria for algae lipid extraction

Session	#	Authors	Title
	174	César García, Daniela Yusti, Jessica Velandia, Silvia Ochoa and Iván Gil	Modeling and simulation of n-butyl lactate production in a reactive distillation column at pilot plant scale
	175	Sunwoo Kim, Seongwhan Kang and Jayhyung Lee	Optimal Design of Offshore Wind Power Farm Considering Wind Uncertainty
	176	Otávio Fonseca Ivo and Lars Struen Imsland Imsland	Economic and environmental impact of fouling in produced water re-injection
Poster session on Wednesday, 22 June	177	Xinhong Liu, Riju De, Alexander Perez, John Hoffman, William Phillip and Alexander Dowling	Mathematical Modelling of Reactive Inks for Additive Manufacturing of Charged Membranes
	178	Heechang Son, Bjørn Austbø, Truls Gundersen, Jihyun Hwang and Youngsub Lim	Economic Analysis of a Hydrogen Liquefaction Process Based on Techno-Economic and Energy Optimization
	179	Yale Zhang, Mitren Sukhram and Ian Cameron	How Digital Twins Are Propelling Metals Industry to Next Generation Decision-Making: A Practitioner's View
	180	Taejong Yu, Donghoi Kim, Truls Gundersen and Youngsub Lim	The Study on Feasibility of HFO Refrigerants in BOG re-liquefaction Process
	181	Wanpeng Zheng, Xiaoyong Gao, Guofeng Kui, Xin Zuo, Yi Xie and Guiyao Zhu	Crude Oil Blending Process Optimization with Precise Consideration of Fraction Properties
	182	Yurim Kim, Jonghun Lim, Hyungtae Cho, Juwon Lee, Il Moon and Junghwan Kim	Novel design of optimum heat exchanger networks for textile dyeing process to maximize wastewater heat recovery efficiency
	183	Jiali Ai, Jianmin Liu, Chi Zhai and Wei Sun	Study on the kinetic parameters of crystallization process modeled by partial differential equations
Poster session on Wednesday, 22 June	184	Felipe M. M. Sousa, Rodolpho R. Fonseca and Flá vio V. Silva	Graphical user interface for development of dynamics model of fermentation process applying long short-term memory networks
	185	Juan Murcia, Rolando Barrera, Alba Ardila and Edwin Zondervan	The biorefinery concept for the industrial valorization of pineapple leaves co-producing ethanol, citric acid, and xanthan gum: a techno-economic analysis
	186	Carlos Rodriguez, Prashant Mhaskar and Vladimir Mahalec	Development methodology for hybrid models of distillation towers
	187	Shigeki Hasegawa, Yusuke Miyamoto, Yoshihiro Ikogi, Sanghong Kim, Miho Kageyama and Motoaki Kawase	Model-Based Development of Fuel Cell Stack and System Controllers
	209	Teemu Ikonen, Keijo Heljanko and Iiro Harjunkoski	Design of an Event-Driven Rescheduling Algorithm via Surrogate-based Optimization
	210	Fatima-Zahra Lahlou, Sarah Namany, Hamish Mackey and Tareq Al-Ansari	A two-stage network optimization for sustainable treated wastewater planning
	211	Alejandro Pedrozo, Sabrina Rodriguez Reartes, Aldo Vecchietti, Maria Soledad Diaz and Ignacio Grossmann	Surrogate Modeling for Superstructure Optimization with Generalized Disjunctive Programming
Poster session on Wednesday, 22 June	212	Carina L. Gargalo, Simoneta Caño de Las Heras, Krist V. Gernaey and Ulrich Krühne	Educational computer-aided tools towards Industry 4.0: recommendations and BioVL
	213	David Bernal, Daniel Ovalle, David Liñán, Luis Ricardez-Sandoval, Jorge Gómez and Ignacio Grossmann	Process Superstructure Optimization through Discrete Steepest Descent Optimization: A GDP analysis and Applications in Process Intensification

Session	#	Authors	Title
	214	David Bernal, Yunshan Liu, Michael Bynum, Carl Laird, John Siirola and Ignacio Grossmann	Advances in Generalized Disjunctive and Mixed-Integer Nonlinear Programming Algorithms and Software for Superstructure Optimization
	215	Andreas Lange and Georg Fieg	Designing Novel Structured Packings by Topology Optimization and Additive Manufacturing
	216	Minsu Kim, Jonggeol Na, Il Moon, Sunghyun Cho, Areum Han, Yoojin Han and Joseph Sang-Il Kwon	Multi-Objective Bayesian Optimization for Design and Operating of Fluidized Bed Reactor
	217	Adriana L. Rodriguez and Carlos A. M. Riascos	Analysis of Optimization Algorithms for Real-Time Optimization applied on the model of a Fluid Catalytic Cracking Unit
	218	Jialu Wang, Elvis Eugene and Alexander Dowling	Scalable Stochastic Programming with Bayesian Hybrid Models
Poster session on Wednesday, 22 June	219	Fanyi Duanmu, Dian Ning Chia and Eva Sorensen	A Combined Particle Swarm Optimization and Outer Approximation Optimization Strategy for the Optimal Design of Distillation Systems
	220	Franjo Cecelja, Linsey Koo and Edlira Vakaj	A semantic based decision support framework to enable model and data integration
	228	Yasunori Kobayashi and Yoshiyuki Yamashita	Formulation of Integrated KPI Dashboard for Chemical Plant
	229	Diana Berenice Vega-Guerrero, Fernando Israel Gómez-Castro and Antioco López-Molina	Evaluation of risk in the biodiesel production process with supercritical ethanol
	230	Chinatsu Ukawa, Yoshiyuki Yamashita and Seiji Hotta	Process Monitoring based on Deep Neural Networks with Continuous Wavelet Transform
	231	Andrei Torgashov, Oleg Snegirev and Fan Yang	Methyl sec-butyl ether content estimation in MTBE products via clustering-based adaptive nonlinear soft sensors
	232	Cheng Ji, Fangyuan Ma, Jingde Wang and Wei Sun	Early identification of faulty deviation in nonstationary processes by removing non-stationarity
Poster session on Wednesday, 22 June	233	Sangwoo Yoo, Dongil Shin, Hunggi Lee and Juri Lim	AI System for Substance Identification Based on Chemical Substance-Symptom Knowledge Graph
	234	Francesco Destro, Massimiliano Barolo and Zoltan Nagy	Model-based monitoring of an intensified unit for continuous pharmaceutical filtration-drying
	235	Naoki Kimura, Yuki Ichikawa, Kazunori Tanihara, Yuichi Makiya, Gen Inoue and Yoshifumi Tsuge	Plant Fault Diagnosis System using Negative Selection Algorithm
	236	Monica Muldbak, Carina Gargalo, Ulrich Krühne, Isuru A. Udugama and Krist V. Gernaey	Digital Twin of a pilot-scale bio-based production setup
	237	Yoshinari Hori, Takaaki Sekiai and Hiroto Takeuchi	Plant O¥& M Support System Based on Supervised Data-Clustering Technology
	238	Om Prakash and Mani Bhushan	A Novel Cycle Partitioning Approach to Reliability Based Optimal Sensor Placement for Linear Flow Processes
	239	Tingting Tao, Jiatao Wen, Yang Li, Cheng Ji, Jingde Wang and Wei Sun	The impact of sampling frequency on chemical process monitoring
Poster session on Wednesday, 22 June	240	Jiatao Wen, Cheng Ji, Jingde Wang and Wei Sun	Autoregressive Distributed Lag Model based Cointegration Analysis for Batch Process Monitoring
	241	Nahid Raeisi Ardali, Reza Zarghami, Rahmat Sotudeh-Gharebagh and Navid Mostoufi	A Data-Driven Fault Detection and Diagnosis by NSGAII-t-SNE and Clustering Methods in the Chemical Process Industry

Session	#	Authors	Title
	368	Brenno Menezes, Mohamed Sawaly, Mohammed Yaqot, Robert Franzoi and Jeffrey Kelly	Design and operation of healthcare facilities using batch-lines: the COVID-19 case in Qatar
	369	Ou Yang and Marianthi Ierapetritou	Application of PSE Methods on Monoclonal Antibody Productivity Improvement and Quality Control
	370	Samira Mohammadi, Ferdous Finklea, Mohammadjafar Hashemi, Elizabeth Lipke and Selen Cremaschi	Image classification of experimental yields for cardiomyocyte cells differentiated from human induced pluripotent stem cells
	371	Norihiko Fukuoka, Sanghong Kim, Takuya Oishi and Ken-Ichiro Sotowa	Prediction of API concentration using NIRS measured off-line and in-line instruments

Session	#	Authors	Title
Energy, Food and Environmental Systems (4) 326,327,328	326	Jude Ejeh, Diarmid Roberts and Solomon Brown	A flexible energy storage dispatch strategy for day-ahead market trading
	327	Niklas Nolzen, Alissa Ganter, Nils Baumgärtner, Ludger Leenders and André Bardow	Monetizing flexibility in day-ahead and continuous intraday electricity markets
	328	Margarita A. Charalambous, Juan D. Medrano-García and Gonzalo Guillén-Gosalbez	Planetary boundaries analysis of Fischer-Tropsch Diesel for decarbonizing heavy-duty transport
Modeling, Analysis and Simulation (3) 149,150,151	149	Swapana Jerpoth, Robert Hesketh, C. Stewart Slater, Mariano Savelski and Kirti Yenkie	Computational Modeling of Lube-Oil Flows in Pipelines to Study the Efficacy of Flushing Operations
	150	Laron Burrows and George Bollas	Comparison of ammonia synthesis plants of different scale with a dynamic model
	151	Hideyuki Matsumoto, Masashi Kikugawa, Anthony Basuni Hamzah, Marie Ishikawa, Yoshihiro Goto, Shinichi Ookawara, Yuichi Manaka, Masayasu Nishi and Tetsuya Nanba	Simulation Analysis of Gas Feed Method for Development of Ru-Based Catalyst for Ammonia Production
Optimization Methods and Computational Tools (3) 202,203,204	202	Sanha Lim, Hwangho Lee, Shinyoung Bae, Jun Seop Shin, Do Heui Kim and Jong Min Lee	Bayesian Optimization for Automobile Catalyst Development
	203	Tushar Rathi and Qi Zhang	Capacity Planning for Sustainable Process Systems with Uncertain Endogenous Technology Learning
	204	Ye Seol Lee, Amparo Galindo, George Jackson and Claire S. Adjiman	Development of a bi-objective optimisation framework for mixed-integer nonlinear programming problems and application to molecular design
Machine Learning and Big Data (4) 271,272,273	271	Zawadi Mdoe, Johannes Jäschke and Mandar Thombre	Data-Driven Online Scenario Selection for Multistage NMPC
	272	Guoqing Hu and Fengqi You	Data-Driven Robust Model Predictive Control with Disjunctive Uncertainty for Building Control
	273	Jiawei Tang, Fei Zhao, Xi Chen and Xiaowen Lin	Low-Dimensional Input and High-Dimensional Output Modelling Using Gaussian Process
Energy, Food and Environmental Systems (5) 329,330,331,332	329	Ning Zhao, Fengqi You and Yanqiu Tao **Error corrected (v.20220531)** *Another presentation was listed in the previous version.	Renewable Power Systems Transition Planning using a Bottom-Up Multi-Scale Optimization Framework
	330	Ruonan Li and Vladimir Mahalec	Design and Operation of Urban Energy Network: Integration of Civic, Industrial, and Transportation Sectors
	331	Xueyu Tian and Fengqi You	Sustainable Design of Hybrid Energy Systems for Net Zero Carbon Emission
	332	Woranunt Lao-Atiman and Soorathep Kheawhom	Prediction of Charge / Discharge Behavior of Tri-Electrode Zinc-air Flow Battery Using Linear Parameter Varying Model

Session	#	Authors	Title
Modeling, Analysis and Simulation (4) 152,153, 154, 155	152	Youngseok Bak and Jong Min Lee	Estimation of the effect of liquid viscosity on gas-liquid mass transfer in a bioreactor using CFD-PBM coupled model
	153	Kiumars Badr, Peter He and Jin Wang	Knowledge-matching based computational framework for genome-scale metabolic model refinement
	154	Srikar Srinivas and Iftekhar Karimi	Multi-Regional Surrogate Model Selection (MRSMS) approach for the analysis and optimal fitting of univariate responses
	155	Deborah Carberry, Seyed Mansouri, Mark N Jones, Khosrow Bagherpour, Christian Beenfeldt and Martin P Andersson	A Digital Reality Pilot Plant for Research and Learning
Optimization Methods and Computational Tools (4) 205,206,207,208	205	Georgios Bounitsis, Lazaros Papageorgiou and Vasileios Charitopoulos	Data-driven scenario generation for two-stage stochastic programming
	206	Shu-Bo Yang, Zukui Li and Jesús Moreira	Joint Chance Constrained Process Optimization through Neural Network Approximation
	207	Alex Durkin, Marcos Millan-Agorio and Miao Guo	Gaussian Processes for Simulation-Based Optimization and Robust Design
	208	Bridgette Befort, Ryan DeFever, Edward Maginn and Alexander Dowling	Machine Learning-Enabled Optimization of Force Fields for Hydrofluorocarbons
Machine Learning and Big Data (5) 274,275,276,277	274	Ilya Stolyarov, Ilya Orson Sandoval, Panagiotis Petsagkourakis and Ehecatl Antonio del Rio-Chanona	Piecewise Smooth Hybrid System Identification for Model Predictive Control
	275	Hyukwon Kwon, Yeongryeol Choi, Hyundo Park, Kwang Cheol Oh, Hyungtae Cho, Il Moon and Junghwan Kim	Distillation Column Temperature Prediction Based on Machine-Learning Model Using Wavelet Transform
	276	Kerul Suthar and Peter He	Moisture estimation in woochips using IIoT Wi-Fi and machine learning techniques
	277	Shohta Kobayashi, Masashi Miyakawa, Susumu Takemasa, Naoki Takahashi, Yoshio Watanabe, Toshiaki Satoh and Manabu Kano	Transfer Learning for Quality Prediction in a Chemical Toner Manufacturing Process