FOPAM 2019

POSTER SESSIONS

August 7 & 8 ◆ 1:30 p.m. to 3:30 p.m.

PHYSICALLY CONSISTENT DATA-DRIVEN SOFT-SENSOR DEVELOPMENT
Yu-Da Hsiao, **Cheng-Hung Chou**, Hai-Bin Wu, Jia-Lin Kang, David Shan Hill Wong, Yuan Yao, Yao Chen Chuang, Shi-Shang Jang and John Di-Yi Ou
(Abstract ID 1)

MACHINE LEARNING OF CORRELATION BETWEEN MOLECULAR STRUCTURE AND SOLVATION CHARACTERISTICS
Jie-Jiun Chang, Jia-Lin Kang, **David Shan-Hill Wong**, Cheng-Hung Chou, Hsuan-Hao Hsu, Chen-Hsuan Huang and Shang-Tai Lin
(Abstract ID 2)

A STUDY ON DEEP AUTOENCODER BASED FAULT DETECTION IN TENNESSEE EASTMAN PROCESS
Zhongying Xiao, Arthur Kordon and Subrata Sen
(Abstract ID 3)

SMART PROCESS DATA ANALYTICS FOR MODEL PREDICTION
Weike Sun and Richard Braatz
(Abstract ID 5)

ON THE CONVERGENCE OF THE DYNAMIC INNER PCA ALGORITHM
Sungho Shin, Alexander Smith, S Joe Qin and Victor Zavala
(Abstract ID 6)

USE OF AI AND DATA ANALYTICS IN ELECTRIC POWER DISTRIBUTION
Linas Mockus, Bri-Mathias Hodge and Gintaras Reklaitis
(Abstract ID 7)

REAL-TIME OPTIMIZATION STRATEGIES USING SURROGATE OPTIMIZERS
Dinesh Krishnamoorthy and Sigurd Skogestad
(Abstract ID 8)

CONDITION-BASED MAINTENANCE FOR SENSOR NETWORK ROBUSTNESS IN CONTINUOUS PHARMACEUTICAL MANUFACTURING
Sudarshan Ganesh, Qinglin Su, Francesco Rossi, Zoltan Nagy and Gintaras Reklaitis
(Abstract ID 9)

IMPROVED BIOMARKER-BASED DIAGNOSTICS OF LEUKEMIA SUBTYPES USING MACHINE LEARNING METHODS
Katherine Schmidt, Purnima Kodate and **Kirti Yenkie**
(Abstract ID 10)

FAULT DETECTION AND IDENTIFICATION USING BAYESIAN RECURRENT NEURAL NETWORKS
Weike Sun, Antonio Paiva, Peng Xu, Anantha Sundaram and Richard Braatz
(Abstract ID 11)

SPARSE PRINCIPAL COMPONENT ANALYSIS (SPCA) TO FACILITATE KNOWLEDGE DISCOVERY AND PROCESS MONITORING
Ahmet Palazoglu and Murat Kulahci
(Abstract ID 12)

A DATA ENGINEERING APPROACH FOR TRACKING INDUSTRIAL CHEMICAL WASTES IN END-OF-LIFE SCENARIOS
Jose D. Hernandez-Betancur, Gerardo J. Ruiz-Mercado and John P. Abraham
(Abstract ID 14)

A NOVEL ALGORITHM FOR CLUSTERING BIG DATA TO DETECT AND DIAGNOSE FAULTS
Avery Smith and **Kody Powell**
(Abstract ID 15)

A NOVEL QUASI-DETERMINISTIC MONTE CARLO METHOD FOR ESTIMATION OF PROBABILITY DISTRIBUTIONS
Francesco Rossi, Linas Mockus and Gintaras Reklaitis
(Abstract ID 16)

HYBRID MODELS: HOW CAN WE TEACH PHYSICAL LAWS TO MACHINE LEARNING MODELS ?
Harini Narayanan, Michael Sokolov, Massimo Morbidelli and Alessandro Butté
(Abstract ID 17)

COMBINING PROCESS SHORT CUTS AND ARTIFICIAL NEURAL NETWORKS FOR PREDICITIVE LIFE CYCLE ASSESSMENT OF CHEMICALS
Johanna Kleinekorte, Marcel Welz, Lorenz Fleitmann, Leif Kröger, Kai Leonhard and André Bardow
(Abstract ID 18)

IMPROVED ACCURACY AND EXPLAINABILITY OF MACHINE LEARNING IN MULTIPHASE FLOWRATE ESTIMATION USING PHYSICS-AWARE ALGORITHMS
Timur Bikmukhametov and Johannes Jäschke
(Abstract ID 19)

SCALE-UP/DOWN OF A MONOCLONAL ANTIBODY MANUFACTURING BIOPROCESS USING DATA ANALYTICS
Pierantonio Facco, Simeone Zomer, Ruth C. Rowland-Jones, Douglas Marsh, Paloma Diaz-Fernandez, Gary Finka, Fabrizio Bezzo and Massimiliano Barolo
(Abstract ID 20)

A WEB-BASED INDUSTRIAL PROCESS MONITORING SYSTEM FOR ETHYLENE PRODUCTION
Fangyuan Ma, Chengyu Han, Cheng Ji, Xianyao Han, Jingde Wang and **Wei Sun**
(Abstract ID 21)

NOVEL TOOL TO SELECT SURROGATE MODELING TECHNIQUE FOR DESIGN SPACE APPROXIMATION
Bianca Williams and Selen Cremaschi
(Abstract ID 22)

SPECTROSCOPIC MODEL CALIBRATION IN BIOMANUFACTURING USING JUST-IN-TIME LEARNING
Aditya Tulsyan, Hamid Khodabandehlou, Tony Wang, Gregg Schorner, Myra Coufal and Cenk Undey
(Abstract ID 24)

ON-LINE CLASSIFICATION OF COAL COMBUSTION QUALITY USING NONLINEAR SVM FOR IMPROVED NEURAL NETWORK OPTIMIZER PERFORMANCE
Jacob Tuttle, Landen Blackburn and Kody Powell
(Abstract ID 25)

DATA FUSION BY JOINT NON-NEGATIVE MATRIX FACTORIZATION FOR HYPOTHESIZING PSEUDO-CHEMISTRY USING BAYESIAN NETWORKS
Anjana Puliyanda, Arno De Klerk, Zukui Li and Vinay Prasad
(Abstract ID 26)

IMAGE-BASED FEATURE EXTRACTION FOR EPS MONITORING ON WWTP BIOREACTORS
Eugeniu Strelet, Ricardo Rendall, **Ivan Castillo**, Hui Lin, Leo Chiang and Marco S. Reis
(Abstract ID 27)

ADVERSARIAL AUTOENCODER BASED FAULT DIAGNOSIS MODEL FOR COMPLEX CHEMICAL PROCESSES
Kyojin Jang, Jonggeol Na, Minsu Kim, Seokyoung Hong and Il Moon
(Abstract ID 28)

BAYESIAN STATISTICAL LEARNING AND STOCHASTIC PROGRAMMING FOR OPTIMAL ENERGY MARKET PARTICIPATION
Xian Gao and Alexander Dowling
(Abstract ID 29)

REPRESENTATION LEARNING FOR INFERENTIAL SENSOR DEVELOPMENT IN AN ELECTRIC ARC FURNACE
Lee Rippon, Ibrahim Yousef, Jean-Francois Beaulieu, Michel Ruel, Sirish Shah and Bhushan Gopaluni
(Abstract ID 30)

A DEEP NEURAL NETWORK APPROACH TO FAULT DETECTION IN STOCHASTIC NONLINEAR SYSTEMS
Kai Wang, **Bhushan Gopaluni**, Junghui Chen and Zhihuan Song
(Abstract ID 31)

DATA-DRIVEN PROCESS CONTROL VIA REINFORCEMENT LEARNING AND RECURRENT NEURAL NETWORKS
Nathan Lawrence, Philip Loewen, Gregory Stewart and **Bhushan Gopaluni**
(Abstract ID 32)

COMBINING MECHANISTIC MODELLING WITH MACHINE LEARNING IN AN INDUSTRIAL CASE STUDY: PREDICTING CREAM CHEESE FERMENTATION
Wei Yu, **David Wilson**, Y Lin and Brent Young
(Abstract ID 33)

MACHINE LEARNING PREDICTION OF BATTERY CYCLE LIFE
Kristen Severson, Peter Attia, Norman Jin, Nicholas Perkins, **Benben Jiang**, Zi Yang, Michael Chen, Muratahan Aykol, Patrick Herring, Dimitrios Fraggedakis, Martin Bazant, Stephen Harris, William Chueh and Richard Braatz
(Abstract ID 35)

LEARNING-BASED CONTROL: APPLICATIONS IN TREATMENT OF COMPLEX SUBSTRATES USING NON-EQUILIBRIUM PLASMAS
Ali Mesbah, Angelo Bonzanini and David Graves
(Abstract ID 37)

SMART PROCESS DATA ANALYTICS FOR SUPERVISED CLASSIFICATION
Fabian Mohr, Weike Sun and Richard D. Braatz
(Abstract ID 38)

COLOR MONITORING IN THE MANUFACTURE OF EXTRUDED POLYMER RECYLE
Ellen Keene, Mark Rickard, Shari Kram, Stephanie Donati and Dane Powell
(Abstract ID 40)

DEEP REINFORCEMENT LEARNING FOR PID CONTROLLER TUNING
Kuang-Hung Liu, **Thomas Badgwell** and Michael Kovalski
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BLIND SOURCE SEPARATION IN RAMAN AND ATR-FTIR SPECTROSCOPY: A PROCESSING CASE STUDY
Giovanni Maria Maggioni, Stefani Kocevska, Ronald W. Rousseau and Martha A. Grover
(Abstract ID 42)

DEEP DETERMINISTIC POLICY GRADIENT ALGORITHM FOR BATCH PROCESS CONTROL
Haeun Yoo, Boeun Kim and Jay H. Lee
(Abstract ID 44)

DUAL ADAPTIVE CONTROL OF A FED-BATCH BIOREACTOR BASED ON APPROXIMATE DYNAMIC PROGRAMMING
Ha-Eun Byun, Boeun Kim and Jay H. Lee
(Abstract ID 45)

MACHINE LEARNING FOR MOLECULAR PROPERTY PREDICTIONS AND A SOFTWARE ECOSYSTEM THAT ENABLES IT
Johannes Hachmann
(Abstract ID 46)

LEARNING SPATIOTEMPORAL DYNAMICS IN WHOLESALE ENERGY MARKETS WITH DYNAMIC MODE DECOMPOSITION
Clay Elmore and Alexander Dowling
(Abstract ID 47)

DECISION-MAKING FOR MULTI-MICROGRID MANAGEMENT SYSTEM USING ALTERNATING DIRECTION METHOD OF MULTIPLIERS
Dongho Han and Jay H. Lee
(Abstract ID 48)

UTILITY FUNCTIONS FOR BAYESIAN DESIGN OF TESTS FOR FAULT DETECTION AND ISOLATION
Evangelos Stefanidis, Kyle Palmer and George Bollas
(Abstract ID 49)

GRAY-BOX IDENTIFICATION USING POLYNOMIAL NARMAX MODELS
Allyne M. dos Santos, Argimiro R. Secchi, Maurício B. de Souza Jr, Sigurd Skogestad and Dinesh Krishnamoorthy
(Abstract ID 50)

NEURAL NETWORK TO ANALYZE WASTEWATER TREATMENT PLANT WITH CEPT
Signe Moe, Bård Myhre, Anne Marthine Rustad and Frank Batey
(Abstract ID 52)

ACTIVE METRIC LEARNING FOR SUPERVISED CLASSIFICATION
Krishnan Kumaran, Dimitri Papagoergiou, Laurens Lueg and Nicolas Sahinidis
(Abstract ID 53)

A ROBUST EXTREMUM SEEKING SCHEME USING TRANSIENT MEASUREMENTS
Dinesh Krishnamoorthy and Sigurd Skogestad
(Abstract ID 54)

MACHINE LEARNING TO IDENTIFY VARIABLES IN THERMODYNAMICALLY SMALL SYSTEMS
David Ford, Aditya Dendukuri, **Gulce Kalyoncu**, Khoa Luu and Matthew Patitz
(Abstract ID 55)

DEEP NEURAL NETWORKS FOR ARTIFACT REMOVAL FROM DATA GENERATED BY NONLINEAR SYSTEMS: HEART RATE MONITORING
Mohammad Reza Askari, Mudassir Rashid, Iman hajizadeh, Mert Sevil, Sediqeh Samadi and Ali Cinar
(Abstract ID 56)

LEAST ANGLE REGRESSION AND PARTIAL LEAST SQUARES REGRESSION ON PROCESS DATA WITH HIGH COLLINEARITY
Siyi Guo, Kenmond Pang and Si-zhao Qin
(Abstract ID 57)

AN INFORMATION-THEORETIC APPROACH TO SENSOR DEPLOYMENT FOR HYDROCARBON PRODUCTION SURVEILLANCE
Ashutosh Tewari, Kuang-Hung Liu, Stijn de Waele and Dimitri Papageorgiou
(Abstract ID 58)

INCREASED PREDICTIVE ACCURACY WITH SIMULATION OPTIMIZATON BASED FEATURE SELECTION
Sara Shashaani and Kimia Vahdat
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KNOWLEDGE-CONSTRAINED MACHINE LEARNING: PREDICTIVE PROCESS MODELING IN THE ABSENCE OF MECHANISTIC UNDERSTANDING AND LARGE DATA SETS
Daniel Griffin, Behnam Partopour and Seth Huggins
(Abstract ID 60)

DEVELOPMENT OF A MODEL PREDICTIVE CONTROL FOR STABILIZATION OF A GAS LIFT OIL WELL
Felipo Soares, Maurício de Souza Jr. and Argimiro Secchi
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MERGING MACHINE LEARNING WITH MECHANISTIC MODELS VIA SEQUENTIAL AND INTEGRATED HYBRID PROCESS MODELING
William Bradley and Fani Boukouvala
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COLLOIDAL PEROVSKITE HALIDE EXCHANGE OPTIMIZATION VIA REAL-TIME MACHINE LEARNING INTEGRATED WITH AUTOMATED MICROFLUIDIC SAMPLING
Robert Epps, Michael Bowen, Kameel Abdel-Latif and Milad Abolhasani
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STABILITY OF GAUSSIAN PROCESS LEARNING BASED OUTPUT FEEDBACK MODEL PREDICTIVE CONTROL
Michael Maiworm, Daniel Limon, Jose Maria Manzo and **Rolf Findeisen**
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OPTIMIZATION OF BIOTECHNOLOGICAL PROCESSES FUSING MACHINE LEARNING AND MODEL BASED CONTROL
Bruno Morabito, Johannes Pholodek, Anton Savchenko, Lisa Carius and Rolf Findeisen
(Abstract ID 65)

TOWARDS NEURAL NETWORK BASED CONTROL WITH GUARANTEES — APPLICATION TO A CHEMICAL REACTOR
Tim Zieger, Janine Matschek, **Hoang Hai Nguyen**, Thimo Oehlschlägel, Anton Savchenko and Rolf Findeisen
(Abstract ID 66)

DEVELOPING MACHINE-LEARNING METHODS FOR THE QUANTITATION OF ORGANIC COMPOUNDS FROM ELECTRON-IONIZATION MASS SPECTROMETRY
Arnab Bose, Amrutha Raghu and Phillip R. Westmoreland
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OSISOFT ACADEMIC HUB FOR ENABLING STUDENT EDUCATION IN PROCESS DATA ANALYTICS
Erica Trump and John Matranga
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DATA SCIENCE ENABLEMENT WITH TIME SERIES DATA USING PI INTEGRATORS AND OSISOFT CLOUD SERVICES
Akhilesh Jain, Elizabeth McErlean and Joy Wang
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