

# FOCAPO-CPC 2023

## CONTRIBUTED POSTER SESSION A

### Digitalization & Innovation Speed

Monday, January 9, 2023

8:00 p.m. to 10:00 p.m.

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PHYSICS-INFORMED MACHINE LEARNING MODELING FOR MODEL PREDICTIVE CONTROL OF NONLINEAR PROCESSES: AN OVERVIEW OF RECENT RESULTS

Yingzhe Zheng and Zhe Wu

(Paper ID #6)

STATISTICAL MACHINE LEARNING IN MODEL PREDICTIVE CONTROL OF NONLINEAR PROCESSES: AN OVERVIEW OF RECENT RESULTS

Mohammed Alhajeri, Aisha Alnajdi, Zhe Wu and Panagiotis Christofides

(Paper ID #8)

A NOVEL STOCHASTIC OPTIMIZATION SOFTWARE FOR THE OPTIMAL DESIGN OF CHEMICAL PROCESSES MODELED IN COMMERCIAL SIMULATION SOFTWARE

Fanyi Duanmu, Dian Ning Chia and Eva Sorensen

(Paper ID #13)

MODEL PREDICTIVE CONTROL TUNING BY MONTE CARLO SIMULATION AND CONTROLLER MATCHING

Morten Ryberg Wahlgreen, John Bagterp Jørgensen and Mario Zanon

(Paper ID #15)

ASYMPTOTICALLY STABLE ECONOMIC NONLINEAR MODEL PREDICTIVE CONTROL WITHOUT PRE-CALCULATED STEADY-STATE OPTIMUM

Kuan-Han Lin and Lorenz Biegler

(Paper ID #20)

BAYESIAN OPTIMIZATION FOR AUTOMATIC TUNING OF MODEL PREDICTIVE CONTROLLERS

Leonardo Gonzalez and Victor Zavala

(Paper ID #27)

ONLINE MACHINE LEARNING MODELING AND PREDICTIVE CONTROL OF SWITCHED NONLINEAR SYSTEMS: AN OVERVIEW OF RECENT RESULTS

Cheng Hu and Zhe Wu

(Paper ID #30)

A REAL-TIME BASED APPROACH TO DISTILLATION CONTROL EDUCATION

Isuru A. Udugama, Michael A. Taube and Brent R. Young

(Paper ID #36)

DATA-ENABLED EXPERIMENTAL DEVELOPMENT OF POLYMER-BASED ORGANIC ELECTRONICS

Aaron Liu, Rahul Venkatesh, Carson Meredith, Elsa Reichmanis and Martha Grover

(Paper ID #39)

DIGITALIZATION AND CONTROL OF AN EXPERIMENTAL ELECTROCHEMICAL REACTOR

Junwei Luo, Berkay Çıtmacı, Joon Baek Jang, Carlos Morales-Guio and Panagiotis Christofides

(Paper ID #40)

CHARACTERIZING THE PARETO OPTIMAL TRADE-OFF BETWEEN MODEL-BASED INFORMATION CONTENT AND MEASUREMENTS COST

Jialu Wang and Alexander Dowling

(Paper ID #46)

OPTIMIZING MEMBRANE CHARACTERIZATION USING THE DATA (DIAFILTRATION APPARATUS FOR HIGH-THROUGHPUT ANALYSIS) FRAMEWORK

Xinhong Liu, Jonathan Ouimet, Laurianne Lair, William Phillip and Alexander Dowling

(Paper ID #47)

DECISION MAKING WITH HYBRID MODELS UNDER PARAMETER AND EPISTEMIC UNCERTAINTY: REACTOR OPTIMIZATION CASE STUDY

Kyla Jones, Elvis Eugene and Alexander Dowling

(Paper ID #51)

PLANT WIDE STEADY STATE OPTIMIZATION USING REINFORCEMENT LEARNING

Kalpesh Patel and Gabriel Winter

(Paper ID #53)

EXTENSION OF SIGN-PERTURBED SUMS METHOD TO MULTIVARIATE SYSTEMS

Masanori Oshima, Sanghong Kim, Yuri Shardt and Ken-Ichiro Sotowa

(Paper ID #58)

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

(Paper ID #64)

ADVANCED MPC FOR LARGE SCALE DYNAMIC SYSTEMS BASED ON MODEL  
REDUCTION TECHNIQUE AND FEEDFORWARD ARTIFICIAL NEURAL NETWORK

Weiguo Xie  
(Paper ID #69)

APPROXIMATION OF NONLINEAR MODEL PREDICTIVE CONTROL USING MIXTURE  
DENSITY NETWORKS

Morimasa Okamoto, Jiayang Ren, Qiangqiang Mao and Yankai Cao  
(Paper ID #73)

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 ChangKyo Yoo  
(Paper ID #75)

BIDIRECTIONAL INVENTORY CONTROL WITH OPTIMAL USE OF INTERMEDIATE  
STORAGE AND MINIMUM FLOW CONSTRAINTS

Lucas Ferreira Bernardino and Sigurd Skogestad  
(Paper ID #83)

EVALUATING SOLUTION PERFORMANCE UNDER UNCERTAINTY IN  
SUPERSTRUCTURE OPTIMIZATION

Julia Granacher, Rafael Castro-Amoedo, Ivan Daniel Kantor and François Maréchal  
(Paper ID #96)

MIXED-INTEGER QUADRATIC OPTIMIZATION USING QUANTUM COMPUTING FOR  
PROCESS APPLICATIONS

Ashfaq Iftakher, Monzure-Khoda Kazi and M. M. Faruque Hasan  
(Paper ID #98)

RECONFIGURATION IN THE MODEL PREDICTIVE CONTROL OF NUMBERED-UP  
MODULAR FACILITIES

Yi Dai and Andrew Allman  
(Paper ID #99)

A PREDICTIVE MODEL FOR IN-SITU MONITORING OF MOLECULAR WEIGHT OF  
COPOLYMERS USING SPECTROSCOPIC METHODS

Tung Nguyen, Ahmad Shamsabadi and Mona Bavarian  
(Paper ID #104)

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  
(Paper ID #105)

STATE ESTIMATION FOR CONTINUOUS-DISCRETE-TIME NONLINEAR STOCHASTIC SYSTEMS

Marcus Krogh Nielsen, Tobias K.S. Ritschel, Ib Christensen, Jess Dragheim, Jakob Kjøbsted Huusom, Krist V. Gernaye and John Bagterp Jørgensen  
(Paper ID #106)

PROGRESSIVE RELAXATIONS FOR EFFICIENT DETERMINATION OF CONSERVATIVE DESIGN SPACES

Daniel Laky, Michael Bynum, Shankar Vaidyaraman, Salvador García Muñoz and Carl Laird  
(Paper ID #108)

A PARTIAL MULTIPARAMETRIC PROGRAMMING METHOD FOR MODEL PREDICTIVE CONTROL

Dustin Kenefake, Sahithi Akundi and Efstratios Pistikopoulos  
(Paper ID #109)