

# FOCAPO / CPC 2017

## POSTER SESSION A

**Monday January 9, 2017**

8:00 pm to 11:00 pm

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MATHEMATICAL MODELING FOR OPTIMUM OPERATION OF HIGHLY EXOTHERMIC EQUILIBRIUM GAS PHASE CATALYTIC REACTIONS USING MULTI-TUBULAR COOLED REACTOR

**Yihui Xu**

*(Paper ID F1)*

EFFICIENT FORMULATIONS FOR DYNAMIC WAREHOUSE LOCATION UNDER DISCRETE TRANSPORTATION COSTS

**Braulio Brunaud**, Matthew H. Bassett, Anshul Agarwal, John M. Wassick and Ignacio E. Grossmann

*(Paper ID F5)*

MULTISCALE MODEL PARALLELIZATION AND RUN-TO-RUN CONTROL OF BATCH PROTEIN CRYSTALLIZATION

**Joseph Kwon** and Panagiotis Christofides

*(Paper ID C6)*

ELUCIDATION AND HANDLING OF VALVE ACTUATOR NONLINEARITY IN PROCESS CONTROL LOOPS: AN OVERVIEW OF RECENT RESULTS

**Helen Durand** and Panagiotis Christofides

*(Paper ID C7)*

SMART MANUFACTURING: APPLICATION TO AN INDUSTRIAL SCALE STEAM-METHANE REFORMER

**Ankur Kumar**, Michael Baldea and Thomas Edgar

*(Paper ID F9)*

MULTI-SCALE MODELING FOR OPTIMAL DESIGN, OPERATION AND INTEGRATION OF POWER GENERATION AND STORAGE SYSTEMS

Masoud Soroush, **Yuriy Y. Smolin** and Kenneth K.S. Lau

*(Paper ID C10)*

APPLICATIONS OF VINYL ACETATE MONOMER (VAM) PLANT MODEL: A NEW BENCHMARK PROBLEM

**Toshiaki Omata**, Shigeki Ootakara, Hiroya Seki, Yoshihiro Hashimoto, Manabu Kano, Yasuhiro Miyake, Naoto Anzai, Masayoshi Sawai, Yuta Machida and Takashi Katsuno

*(Paper ID C13)*

MIXED-INTEGER NON-LINEAR PROGRAMS FOR OPTIMAL DETECTION AND ISOLATION OF FAULTS

**William Hale**, Kyle Palmer and George Bollas

*(Paper ID F14)*

OPTIMAL RAIL SCHEDULING IN LIMITED FLEXIBILITY ENVIRONMENTS

**Danielle Zyngier**, Jan Lategan and Ludwig Furstenberg

*(Paper ID F15)*

OPTIMAL CONTROL OF A LINEARIZED CONTINUUM MODEL FOR RE-RENTRANT MANUFACTURING PRODUCTION SYSTEMS

**Xiaodong Xu** and Stevan Dubljevic

*(Paper ID C16)*

MODEL-PREDICTIVE SAFETY SYSTEM FOR PREDICTIVE DETECTION OF OPERATION HAZARDS

**Masoud Soroush**, Taha Mohseni Ahooyi, Jeffrey Arbogast and Warren Seider

*(Paper ID C17)*

INTEGRATION OF CAMPAIGN SCHEDULING, DYNAMIC OPTIMIZATION AND OPTIMAL CONTROL IN MULTI-UNIT BATCH PROCESSES

**Francesco Rossi**, Gintaras Reklaitis, Flavio Manenti and Guido Buzzi-Ferraris

*(Paper ID F19)*

ECONOMIC IMPROVEMENT OF CONTINUOUS BIOCHEMICAL REACTORS VIA MULTI-FEED OPERATION

**Jonathan P. Raftery** and M. Nazmul Karim

*(Paper ID F21)*

DISTRIBUTED CHEMICALS AND ELECTRICITY PRODUCTION WITH REGULATED ENERGY EXCHANGE

**Andrew Allman**, Michael Zachar and Prodromos Daoutidis

*(Paper ID F22)*

ROBUST OPTIMIZATION WITH DATA DRIVEN ASYMMETRIC UNCERTAINTY SET CONSTRUCTION

**Zukui Li** and Said Rahal

*(Paper ID F23)*

A SIMULATION-OPTIMIZATION APPROACH TO INTEGRATE PROCESS DESIGN AND PLANNING DECISIONS UNDER TECHNICAL AND MARKET UNCERTAINTIES

Catarina Marques, **Samuel Moniz**, Jorge Pinho de Sousa and Ana Paula Barbosa-Póvoa

*(Paper ID F24)*

DETECTING SYMMETRY IN DESIGNING HEAT EXCHANGER NETWORKS

**Georgia Kouyialis** and Ruth Misener

*(Paper ID F25)*

HEALTH AWARE OPERATION OF A SUBSEA GAS COMPRESSION SYSTEM

**Adriaen Verheyleweghen** and Johannes Jäschke

*(Paper ID F26)*

ACCOUNTING FOR MEMBRANE PROPERTIES IN MATHEMATICAL MODELS  
OF HIGH-PRESSURE MEMBRANE CONTACTORS FOR NATURAL GAS  
SWEETENING

**Ven Chian Quek**, Nilay Shah and Benoit Chachuat

*(Paper ID F27)*

MULTISCALE PRODUCTION ROUTING IN INDUSTRIAL GAS SUPPLY CHAINS

Qi Zhang, Arul Sundaramoorthy, **Ignacio E. Grossmann** and Jose M. Pinto

*(Paper ID F31)*

NONLINEAR ROBUST OPTIMIZATION WITH UNCERTAIN EQUALITY  
CONSTRAINTS

Yuan Yuan, **Zukui Li** and Biao Huang

*(Paper ID F32)*

UNCERTAINTY ANALYSIS IN MULTIPHASE FLOW PREDICTIONS IN  
PRESENCE OF SOLIDS

**Wei Dai**, Selen Cremaschi, Hariprasad Subramani and Haijing Gao

*(Paper ID F33)*

SEMI-BATCH CHEMICAL-LOOPING REACTORS INTEGRATED WITH  
COMBINED CYCLE POWER PLANTS OPERATING AT TRANSIENT  
ELECTRICITY DEMAND

Chen Chen and **George Bollas**

*(Paper ID F34)*

ANALYSIS OF DETERMINISTIC ONLINE SCHEDULING

**Dhruv Gupta** and Christos Maravelias

*(Paper ID F37)*

ARTIFICIAL LIFT INFRASTRUCTURE PLANNING FOR SHALE GAS  
PRODUCING HORIZONTAL WELLS

**Zuo Zeng** and Selen Cremaschi

*(Paper ID F39)*

MODEL-BASED OPTIMIZATION OF THE MEDIUM REFRESHMENT REGIME  
DURING NEOTISSUE GROWTH IN A PERFUSION BIOREACTOR

**Mohammad Mehrian**, Yann Guyot, Ioannis Papantoniou, Maarten Sonnaert and Liesbet Geris

*(Paper ID F41)*

MODIFIER ADAPTATION APPROACH USING RELS TO COMPUTE PROCESS  
GRADIENTS

**Tania Rodríguez-Blanco**, Daniel Sarabia and César de Prada

*(Paper ID C42)*

PRODUCT AND CLOSED-LOOP SUPPLY CHAIN DESIGN WITH UNCERTAIN  
RETURN FLOWS

Luis Javier Zeballos, Carlos Alberto Méndez and **Ana Paula Barbosa-Póvoa**

*(Paper ID F43)*

A BRANCH AND BOUND ALGORITHM TO SOLVE LARGE SCALE  
MULTISTAGE STOCHASTIC PROGRAMS

**Brianna Christian** and Selen Cremaschi

*(Paper ID F44)*

MINLP MODELS FOR OPTIMAL DESIGN OF RELIABLE CHEMICAL PLANTS

**Yixin Ye**, Ignacio Grossmann and Jose Pinto

*(Paper ID F45)*

FLWSHEET MODELING OF A CONTINUOUS DIRECT COMPRESSION  
TABLETING PROCESS AT PRODUCTION SCALE

**Shaun Galbraith**, Zhuangrong Huang, Bumjoon Cha, Huolong Liu, Samantha Hurley, Matthew Flamm, Robert Meyer and Seongkyu Yoon

*(Paper ID F46)*

AIR-QUALITY CONSCIOUS SCHEDULING FOR MULTI-PLANT TURNAROUND  
OPERATIONS

Sijie Ge, Sujing Wang, Qiang Xu and Tomas C Ho, (**Min Chen, Presenter**)

*(Paper ID F47)*

VARIABLE REDUCTION FOR SURROGATE MODELLING

**Julian Straus** and Sigurd Skogestad

*(Paper ID F50)*

CRUDE-OIL BLEND SCHEDULING OPTIMIZATION OF AN INDUSTRIAL-SIZED  
REFINERY: A DISCRETE-TIME BENCHMARK

Jeffrey Kelly, **Brenno Menezes**, Faramroze Enginner and Ignacio Grossmann

*(Paper ID F53)*

ONLINE OPTIMAL CONTROL OF A FLUIDIZED BED SPRAY GRANULATION  
PROCESS BASED ON A THREE-PHASE POPULATION BALANCE MODEL

**Huolong Liu**, Shaun Galbraith, Bumjoon Cha, Zhuangrong Huang, Seoyoung  
Park and Seongkyu Yoon

*(Paper ID C55)*

APPLICATION OF FORMAL VERIFICATION AND FALSIFICATION TO LARGE-  
SCALE CHEMICAL PLANT AUTOMATION SYSTEMS

**Blake C. Rawlings**, John M. Wassick and B. Erik Ydstie

*(Paper ID C58)*

OPERABILITY-BASED APPROACH FOR PROCESS DESIGN, INTENSIFICATION,  
AND CONTROL: APPLICATION TO HIGH-DIMENSIONAL AND NONLINEAR  
MEMBRANE REACTORS

Juan Carrasco and **Fernando Lima**

*(Paper ID C63)*

CHALLENGES AND OPPORTUNITIES FOR LOT-ENABLED MANUFACTURING:  
WHAT WE LEARNED FROM AN LOT-ENABLED MANUFACTURING  
TECHNOLOGY TESTBED

Devarshi Shah, Austin Hancock, Anthony Skjellum, Jin Wang and **Peter He**

*(Paper ID C66)*

PREDICTIVE CONTROL AND ESTIMATION FOR THE ADAPTIVE  
MANAGEMENT OF LAKE LEVELS AND STREAM FLOWS IN COMPLEX  
WATERSHEDS

**Jeffrey Kantor**, Michelle Pham and Kelly McGarry

*(Paper ID C70)*