KoMSO

KoMSO Challenge Workshop

Challenges for Mathematical Modeling, Simulation and Optimization for Advanced Process Control of Batch Processes

Tentative Schedule

Thursday – February 9, 2017

12:00 Arrival, Registration, Lunch

13:00 **Address of Welcome**
Hans Georg Bock (IWR, Heidelberg University)

13:15 **Optimal Operation of Batch Processes under Model Uncertainty**
Sebastian Engell (TU Dortmund)

13:45 **Fully Automatic Control of Batch and Semi-batch Polymerization Reactions using Automatic Continuous Online Monitoring of Polymerization Reactions with a Control Interface (ACOMP/CI)**
Wayne F. Reed (Tulane University)

14:15 **Fast Hybrid Monte Carlo Model for Semi-batch Emulsion Copolymerization**
Thomas Chaloupka (University of Chemistry and Technology Prague)

14:45 Group Photo / Coffee Break

15:15 **Software for Batch Optimization with Focus on Reduction of Energy Consumption and Material Losses**
Philippe Allot (ORDINAL Software)

15:45 **Recent Advances in Nonlinear Model Predictive Control**
Hans Georg Bock (IWR, Heidelberg University)

16:15 **Mathematical Modeling and Model-based Real-time Control Tools for Liquid Steelmaking Processes**
Bernd Kleimt (VDEh-Betriebsforschungsinstitut)

16:45 Poster Session & Coffee Break

Fast Hybrid Monte Carlo Model for Semi-batch Emulsion Copolymerization
Thomas Chaloupka (University of Chemistry and Technology Prague)

Challenges in Online Monitoring and Model Predictive Control of a Semi-batch Polymerization Process
Johannes Faust and Preet J. Joy (RWTH Aachen)

Accelerating NMPC by Simultaneous NMPC and MHE
Ekaterina A. Kostina (IWR, Heidelberg University)

Moving Horizon Estimation - a Powerful Tool for Online State and Parameter Estimation in Nonlinear Dynamic Systems
Tom Kraus (IWR, Heidelberg University)

Particle Monitoring in Industrial Processes using Sensors based on Acoustic Wave Technologies
Alexei Lapkin (University of Cambridge)

Fast Numerical Methods for Multi-stage NMPC
Conrad Leidereiter (IWR, Heidelberg University)

Fast Numerical Methods for NMPC
Andreas Potschka (IWR, Heidelberg University)

Dual Control with Application to a Biochemical Benchmark Problem
Huu Chuong La (IWR, Heidelberg University)

An Innovative and Fast Mathematical Model for Prediction and Control of Dynamic Development of Latex Particle
Noushin Rajabalinia (POLYMAT, University oft he Basque Country)

Integration of In-line Measurements, Dynamic Process Models and Real-time Control Tools for Optimal Plant Operation in Liquid Steelmaking
Bernd Kleimt (VDEh-Betriebsforschungsinstitut)

17:45 Discussion

19:00 Dinner at Brauhaus Vetter
Steingasse 9, 69117 Heidelberg

Friday – February 10, 2017

9:00 **Control and Optimization of Batch Chemical Processes — An Overview**
Dominique Bonvin and Alejandro Marchetti (Laboratoire d'Automatique, EPFL)

9:30 **Surrogate Models for Real-time Optimization and Control**
Alexei Lapkin (University of Cambridge)

10:00 **Industrial Batch Control Applications using Nonlinear Model Predictive Control Technology based on Mechanistic Models**
Peter Singstad (Cybernetica, Norway)

10:30 Coffee Break

11:00 **Challenges and Opportunities in Shared Resource Allocation for Batch Reactors**
Lukas Maxeiner (TU Dortmund)

11:30 **Challenges and Future Prospects in Online Monitoring and Model Predictive Control of Emulsion Polymerization Reactors**
Johannes Faust and Preet J. Joy (RWTH Aachen)

12:00 Closing Discussion & Farewell